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QUERCETIN

A MEDICAL DICTIONARY, BIBLIOGRAPHY,
AND ANNOTATED RESEARCH GUIDE TO
INTERNET REFERENCES

JAMES N. PARKER, M.D.
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The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this book which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which produce publications on quercetin. Books in this series draw from various agencies and institutions associated with the United States Department of Health and Human Services, and in particular, the Office of the Secretary of Health and Human Services (OS), the Administration for Children and Families (ACF), the Administration on Aging (AOA), the Agency for Healthcare Research and Quality (AHRQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Healthcare Financing Administration (HCFA), the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the institutions of the National Institutes of Health (NIH), the Program Support Center (PSC), and the Substance Abuse and Mental Health Services Administration (SAMHSA). In addition to these sources, information gathered from the National Library of Medicine, the United States Patent Office, the European Union, and their related organizations has been invaluable in the creation of this book. Some of the work represented was financially supported by the Research and Development Committee at INSEAD. This support is gratefully acknowledged. Finally, special thanks are owed to Tiffany Freeman for her excellent editorial support.

About the Editors

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Table of Contents

FORWARD

In March 2001, the National Institutes of Health issued the following warning: "The number of Web sites offering health-related resources grows every day. Many sites provide valuable information, while others may have information that is unreliable or misleading."[1] Furthermore, because of the rapid increase in Internet-based information, many hours can be wasted searching, selecting, and printing. Since only the smallest fraction of information dealing with quercetin is indexed in search engines, such as **www.google.com** or others, a non-systematic approach to Internet research can be not only time consuming, but also incomplete. This book was created for medical professionals, students, and members of the general public who want to know as much as possible about quercetin, using the most advanced research tools available and spending the least amount of time doing so.

In addition to offering a structured and comprehensive bibliography, the pages that follow will tell you where and how to find reliable information covering virtually all topics related to quercetin, from the essentials to the most advanced areas of research. Public, academic, government, and peer-reviewed research studies are emphasized. Various abstracts are reproduced to give you some of the latest official information available to date on quercetin. Abundant guidance is given on how to obtain free-of-charge primary research results via the Internet. **While this book focuses on the field of medicine, when some sources provide access to non-medical information relating to quercetin, these are noted in the text.**

E-book and electronic versions of this book are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). If you are using the hard copy version of this book, you can access a cited Web site by typing the provided Web address directly into your Internet browser. You may find it useful to refer to synonyms or related terms when accessing these Internet databases. **NOTE:** At the time of publication, the Web addresses were functional. However, some links may fail due to URL address changes, which is a common occurrence on the Internet.

For readers unfamiliar with the Internet, detailed instructions are offered on how to access electronic resources. For readers unfamiliar with medical terminology, a comprehensive glossary is provided. For readers without access to Internet resources, a directory of medical libraries, that have or can locate references cited here, is given. We hope these resources will prove useful to the widest possible audience seeking information on quercetin.

The Editors

[1] From the NIH, National Cancer Institute (NCI): **http://www.cancer.gov/cancerinfo/ten-things-to-know**.

CHAPTER 1. STUDIES ON QUERCETIN

Overview

In this chapter, we will show you how to locate peer-reviewed references and studies on quercetin.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and quercetin, you will need to use the advanced search options. First, go to **http://chid.nih.gov/index.html**. From there, select the "Detailed Search" option (or go directly to that page with the following hyperlink: **http://chid.nih.gov/detail/detail.html**). The trick in extracting studies is found in the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Journal Article." At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display "whole records." We recommend that you type "quercetin" (or synonyms) into the "For these words:" box. Consider using the option "anywhere in record" to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the "Search in these fields" drop box. The following is what you can expect from this type of search:

- **Quercetin in Men with Category III Chronic Prostatitis: A Preliminary Prospective, Double-Blind, Placebo-Controlled Trial**

  Source: Urology. 54(6): 960-963. December 1999.

  Contact: Available from Urology. P.O. Box 2126, Marion, OH 43306-8226. (800) 215-4692. Fax (740) 382-5866.

  Summary: The National Institutes of Health (NIH) category III chronic prostatitis syndromes (nonbacterial chronic prostatitis and prostatodynia or prostate pain) are common disorders with few effective therapies. Bioflavonoids have recently been shown in an open-label study to improve the symptoms of these disorders in a significant proportion of men. This article reports on a study undertaken to confirm these findings in a prospective randomized, double-blind, placebo controlled trial. The study included

30 men with category IIIa and IIIb chronic pelvic pain syndrome who were randomized in a double blind fashion to receive either placebo or the bioflavonoid **quercetin** 500 milligrams twice daily for 1 month. The NIH chronic prostatitis symptom score was used to grade symptoms and the quality of life impact at the start and conclusion of the study. In a followup, unblind, open label study, 17 additional men received 1 month of a supplement containing **quercetin,** as well as bromelain and papain (Prosta-Q), which enhance bioflavonoid absorption. Two patients in the placebo group refused to complete the study because of worsening symptoms, leaving 13 placebo and 15 bioflavonoid patients for evaluation in the blind study. Both the **quercetin** and placebo groups were similar in age, symptom duration, and initial symptom score. Patients taking placebo had a mean improvement in NIH symptom score from 20.2 to 18.8 (not significant), while those taking the bioflavonoid had a mean improvement from 21.0 to 13.1. Twenty percent of patients taking placebo and 67 percent of patients taking the bioflavonoid had an improvement of symptoms of at least 25 percent. In the 17 patients who received Prosta-Q in the open label study, 82 percent had at least a 25 percent improvement in symptom score. The authors conclude that therapy with the bioflavonoid **quercetin** is well tolerated and provides significant symptomatic improvement in most men with chronic pelvic pain syndrome. 1 figure. 1 table. 26 references.

Federally Funded Research on Quercetin

The U.S. Government supports a variety of research studies relating to quercetin. These studies are tracked by the Office of Extramural Research at the National Institutes of Health.[2] CRISP (Computerized Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other institutions.

Search the CRISP Web site at **http://crisp.cit.nih.gov/crisp/crisp_query.generate_screen**. You will have the option to perform targeted searches by various criteria, including geography, date, and topics related to quercetin.

For most of the studies, the agencies reporting into CRISP provide summaries or abstracts. As opposed to clinical trial research using patients, many federally funded studies use animals or simulated models to explore quercetin. The following is typical of the type of information found when searching the CRISP database for quercetin:

- **Project Title: ALCOHOL POLYPHENOL INDUCED ENDOTHELIAL FIBRINOLYSIS**

  Principal Investigator & Institution: Booyse, Francois M.; Professor of Medicine & Cell Biol.; University of Alabama at Birmingham Uab Station Birmingham, Al 35294

  Timing: Fiscal Year 2003; Project Start 01-JUL-2003; Project End 30-JUN-2008

  Summary: Moderate alcohol or red wine consumption (1-4 drinks/day) reduces the risk for CHD-related mortality. This cardioprotection may be due, in part, to increased fibrinolysis. Endothelial cells (ECs) synthesize t-PA, u-PA, PAI-1 and receptors (Rs) for

[2] Healthcare projects are funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), Agency for Healthcare Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH).

PAs and plasminogen (Pmg) (PARs, PmgRs) and maintain normal hemostasis/fibrinolysis by activating R-bound Pmg through the regulated synthesis/interactions of these fibrinolytic components. Changes in these EC components/interactions by systemic factors (such alcohol, wine components, in particular polyphenols) that increase fibrinolysis will reduce the risk for thrombosis, atherosclerosis/CHD and the atherothrombotic consequences of MI. We have shown that ethanol/polyphenols increase fibrinolysis in cultured human ECs. The overall goal of these studies is to further identify/define the molecular regulatory mechanisms by which low ethanol/polyphenols (catechin, quercetin) affect the activity/expression of EC PAs, PARs and PmgRs, in vitro and in vivo, resulting in increased EC fibrinolysis. Studies will include effects on: expression of PAs/PARs/PmgRs antigen/mRNA in vivo in mouse aortic endothelium, including direct effects of increased fibrinolysis, in vivo, on clot lysis and inhibition of atherosclerosis in wild type and genetically deficient mice (Aim 1); in vivo and in vitro cross-talk between induced increased fibrinolysis and increased bioavailability of NO, including early activation of cellular kinases (i.e. MAPKs) (Aim 2); changes in expression of EC PARs/PmgRs activity/levels/mRNA (in cultured human coronary artery ECs), including individual R contribution to total ligand binding (using R-specific antisense oligonucleotides), regulation of Rs gene expression (transcriptional and/or post-transcriptional) and other PA-induced effects on PARs/PmgRs expression (in cultured PA-deficient mouse aortic EC) (Aim 3) and; identification of ethanol/polyphenol responsive cis-acting elements in the t-PA and u-PA gene promoters, including their ethanol-/polyphenol-inducible transcription factors (Aim 4). Results gleaned from these studies will provide new insights into the molecular mechanisms by which ethanol/polyphenols regulate EC fibrinolysis and contribute to the cardioprotection attributed to moderate alcohol/red wine consumption. An increased understanding of the mechanisms by which these compounds effectively afford cardioprotection will facilitate future development of new therapeutic approaches/strategies that may be widely applied to reduce the overall population risk for CHD-related mortality.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BORAGE OIL AND GINKGO BILOBA (EGB 761) IN ASTHMA**

  Principal Investigator & Institution: Gershwin, Merrill E.; Internal Medicine; University of California Davis Sponsored Programs, 118 Everson Hall Davis, Ca 95616

  Timing: Fiscal Year 2002; Project Start 18-SEP-2000; Project End 31-JUL-2005

  Summary: Project I: Borage Oil and Ginkbo biloba (EGb 761) in Asthma, ME Gershwin, PI overall; V Ziboh, PI of Oil, Co-Invest; SS Teuber, PI of Ginkbo biloba; M Harkey, JB German & c Cross, Co-Invest; J Utts, M Watnik, AL Klassen, Statistics and Database Management; H Watanabe, Consultant The concept of asthma as a condition in which acute and chronic inflammatory changes in airways play a fundamental role is well established. The role of leukotrienes as a crucial element of these inflammatory processes is supported by abundant laboratory and clinical evidence. There is a potential for herbal medicinal approaches to ameliorate leukotriene-mediated inflammation in asthma based on data from the literature and our laboratory. Studies suggest that dietary gamma-linolenic (GLA), found in borage and evening primrose oil, is unique among the (n=6) polyunsaturated fatty acid family members (linolenic acid, GLA and arachidonic acid) in its potential to attenuate inflammatory processes. For instance, there are randomized, placebo- controlled trials (RCT) demonstrating efficacy of dietary GLA in patients with rheumatoid arthritis and active synovitis. Ginkbo biloba, a flavonoid-rich extract of leaves of the Ginkbo biloba tree, has been studied in one RCT

with asthma patients and is recommended by CAM practitioners as a treatment of allergic inflammation and asthma. Ginko biloba may have inhibitory effects on release of inflammatory mediators. Although improvements has been made in management of patients with asthma, may interventions are associated with adverse effects. Because of the possibility of minimal or negligible adverse effects reported with borage oil, and the widespread use of Ginkgo biloba supplements without known adverse effects, we will assess clinical efficacies and/or adverse effects of dietary borage oil containing GLA and Ginkbo biloba in patients with asthma in a 17 month RCT. We also propose to delineate whether or not the clinical course of treatment correlates with suppression of leukotriene B4 (LTB4), LTC4 and LTD4, generated by activated polymorphonuclear cells (PMNs). Additionally, in the Ginkgo biloba arm of study, the vitro/ex vivo inhibition of histamine release will be assayed, since one of its major constituents, **quercetin,** is known to be structurally related to cromolyn sodium and has been shown in in vitro studies to exhibit similar activities. Furthermore. Anti-inflammatory activities of Ginkbo biloba will be compared to those of some of its individual constituents in a series of in vitro experiments. It is hoped that findings from these studies will evolve relatively non-toxic therapeutic alternatives for attenuating bronchial hyperresponsiveness and inflammation in patients with asthma.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CARDIOVASCULAR EFFECTS OF SCUTELLARIA BAICELENSIS**

  Principal Investigator & Institution: Yuan, Chun-Su; Anesthesia and Critical Care; University of Chicago 5801 S Ellis Ave Chicago, Il 60637

  Timing: Fiscal Year 2002; Project Start 20-SEP-2001; Project End 31-AUG-2003

  Summary: (provided by applicant): Cardiovascular disease remains a leading cause of death throughout the world, with many dying outside the hospital due to cardiac arrest. Although oxidants may play an important role in this major cardiovascular disease, little has been done to examine what role traditional vs. nontraditional antioxidants may play in its acute treatment. During the past year, our group investigated cardioprotective effects of Scutellaria baicalensis, a Chinese medicinal herb. We reported that an extract of Scutellaria baicalensis dose-dependently attenuated reactive oxygen species in cardiomyocytes and decreased cell death. We were particularly excited to observe that Scutellaria baicalensis extract rapidly quenched reactive oxygen species generated in mitochondria. The ability to gain rapid access to intracellular sites, such as mitochondria, and attenuate reactive oxygen species is a significant advantage, a characteristic that may be lacking in antioxidants currently in use. In separate studies, we observed that **quercetin,** a plant flavonoid, inhibited endothelin-1 and stimulated tissue plasminogen activator in vascular endothelial cells. Thus, we hypothesize that flavonoids of Scutellaria baicalensis have significant antioxidant potential, and they regulate the concentration of endothelial vasoactive mediators. Heart disease is a complex multifactorial disorder with a variety of underlying causes and risk factors. In the development of ischemic heart disease, the site of initial injury is the vascular endothelium. During later stages, ischemic and reperfusion injury to cardiomyocytes lead to loss of contractility and cell death. We propose to investigate in vitro pharmacological effects of Scutellaria baicalensis in two experimental models: embryonic chick cardiomyocytes, and human umbilical vein endothelial cells. In the proposed project, we will identify active flavonoids of Scutellaria baicalensis and investigate their 1) antioxidant action in cardiomyocytes, and 2) pharmacological effects on vasoactive mediators in endothelial cells. We will test whether Scutellaria baicalensis extract and its flavonoids (baicalein and wogonin, skullcapflavone I, and

skullcapflavone II) act as antioxidants in cardiomyocytes, and test whether Scutellaria baicalensis extract and its flavonoids change the concentration of thrombin-stimulated endothelin-1, and tissue plasminogen activator in vascular endothelial cells. In addition, antioxidant activity comparison will be made between Scutellaria baicalensis and American ginseng. The results of our project will be used to develop potential new therapeutic agents from active components of Scutellaria baicalensis.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CHEMICO-PHYSICAL PROPERTIES OF METAL-FLAVONOID**

  Principal Investigator & Institution: Cheng, Francis I.; Chemistry; University of Idaho Moscow, Id 838443020

  Timing: Fiscal Year 2001; Project Start 01-APR-2001; Project End 31-MAR-2005

  Summary: (provided by applicant) Flavonoids are recognized as an important class of nutrient that may be responsible for the chemoprevention of a myriad of degenerative diseases. This action is attributed to their putative antioxidant action. Many investigators have recognized that metal chelation is an important determinate in the prediction of the antioxidant action of flavonoids. However, there is a paucity of data accumulated concerning the chemico-physico properties of metal-flavonoid complexes. A previous investigation from this laboratory has found that four flavonoids, baicilein, luteolin, naringenin, and **quercetin,** chelate pro-oxidant iron ions into a complex that is not Fenton Reaction active. Another plant-borne product, salicylate has been the subject of previous investigations from this laboratory and found to chelate pro-oxidant iron into a form that is again not Fenton Reaction active. The proposed investigations will study the similarity of action between the four aforementioned flavonoids and salicylate, i.e. the ability to bind pro-oxidant metals both as free ions and in low molecular-weight complexes. The pro-oxidant metals of concern in this study are Fe, Cu, and Mn ions and also in complexed forms with EDTA, ATP/ADP and in porphyrins. The redox potential of each metal complex will predict the antioxidant characteristics in terms of Fenton Reaction activity, other redox-dependent actions such as superoxide dismutase and catalase activity. Metal-flavonoid binding constants will aid in determining if the flavonoids are effective in vivo chelation agents. These data will be derived by potentiometric titrations augmented with UV-vis absorbance. The four flavonoids chosen for this study will give insights into structure-activity relationships. It is hoped that the subject of this investigation will give a new paradigm for the design, and discovery of antioxidants, and anti-inflammatory agents.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: DRUG INTERACTIONS AND BIOAVAILABILITY OF CRANBERRY**

  Principal Investigator & Institution: Donovan, Jennifer L.; Psychiatry and Behavioral Scis; Medical University of South Carolina 171 Ashley Ave Charleston, Sc 29425

  Timing: Fiscal Year 2004; Project Start 06-JAN-2004; Project End 31-DEC-2005

  Summary: (provided by applicant): Cranberry (CB) juice and powders are currently being used as complementary and alternative medications. CB products may be used alone or in combination with conventional medications to treat urinary tract infection, or other medications to treat acute or chronic conditions. CB is a rich source of flavonoids, a class of phytochemicals with diverse biological activities. The specific aims of this research are 1) to evaluate the potential for CB-drug interactions and 2) to determine the pharmacokinetics and renal clearance of four major CB flavonoids. A normal volunteer study is proposed to determine the potential of CB to participate in interactions with

conventional drugs. The induction/inhibition of the major cytochrome P-450 (CYP) enzymes will be the primary method of evaluation. The CYP isoforms to be studied, CYP3A4, CYP2D6 and CYP1A2, are involved in the metabolism of >80% of marketed prescription and over the counter medications. Single doses of the three safe, probe drugs alprazolam (ALPZ; 3A4 probe), dextromethorphan (DM; CYP2D6 probe), and caffeine (CAF; CYP1A2 probe) will be administered at baseline (before treatment with CB) and after a 14-day treatment period with CB powder. Changes in the pharmacokinetics of these probe drugs will indicate the degree of specific enzyme inhibition or induction. In the same normal volunteers, the key pharmacokinetic parameters for four major CB flavonoids will be estimated by following the plasma concentration versus time course of absorbed flavonoids and their excretion in urine. The area under the plasma concentration versus time curve (AUC), oral clearance (Clo), terminal elimination half-life (T1/2) and renal clearance (Clren) will be determined for: epicatechin, **quercetin** (total glycosides), procyanidin A2, and cyanidin-3-galactoside. These components represent the major classes of flavonoids in CB and are selected for study due to their abundance in CB and their documented biological activities. The pharmacokinetics and renal clearance of CB flavonoids will be determined first after a single dose of a characterized CB juice prior to administration of any probe drugs. Steady-state plasma levels of flavonoids will be determined at the end of the 14-day treatment period of multiple dosing with the characterized CB powder. This research will provide new, important data on the pharmacokinetics of flavonoids from CB juice and from a CB powder, an area where no data currently exist. This information is essential to elucidate the mechanisms of action of CB flavonoids in the context of specific conditions/diseases and to evaluate CB as a source of dietary flavonoids. These data will also complement NCCAM studies assessing the clinical safety and efficacy of CB and will allow more informed recommendations about the use of CB when combined with conventional medications.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: DRUG-DIETARY FLAVONOID INTESTINAL ABSORPTION INTERACTION**

  Principal Investigator & Institution: Rodriguez, Rosita J.; None; Oregon State University Corvallis, or 973391086

  Timing: Fiscal Year 2002; Project Start 17-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant): The opportunity for drug-dietary interaction is an everyday occurrence whether the interaction is with food, juice, or dietary supplements. Moreover, the consumption of flavonoids is being urged because of their multiple health benefits; thus, understanding the possible biological effects of the flavonoids on intestinal drug absorption is essential. Flavonoids may be a particularly important class of modulators due to their ubiquitous occurrence in foods and drinks of plant origin and their known interactions with P-glycoprotein (Pgp) and cytochrome P450 (CYP). These dietary constituents may modulate transport in the intestinal tract and significantly alter the absorption of important therapeutic agents. The increased systemic bioavailability of some drugs, nifedipine and felodipine, associated with ingestion of grapefruit juice represents a couple of widely publicized drug-dietary-interactions. An increase or decrease in drug absorption may be due to (i) alterations in Pgp mediated or non Pgp mediated transport and/or (ii) presystemic intestinal metabolism by CYP and/or the flavin-containing monooxygenases. Furthermore, patents have been filed which incorporate flavonoids as excipients in pharmaceutical formations with the intent to alter drug absorption. Thus, the specific hypothesis of this study is that dietary

flavonoids can alter the Pgp-dependent or Pgp-independent transport of certain therapeutic drugs. Studies will be conducted using flavonoids belonging to different subclasses such as isoflavone, flavanone, flavonol, and flavanol (e.g., genistein, naringenin, **quercetin,** and epigallocatechin gallate, respectively) to gain an insight into structure-activity relationships in the alteration of transport of Pgp-dependent substrates and Pgp-independent substrates by these phytochemicals. The flavonoids will be evaluated using Caco-2 cells, a human intestinal cell line. These cells have been well characterized to express Pgp transporters and non Pgp transporters such as Na+/K+, Na+/H+, amino acids, peptides, bile acid, and vitamin B12. This project will provide new knowledge on how flavonoids affect the dynamic transport mechanisms located in the intestinal mucosa. Thus, the results of this study will increase our understanding of the role of flavonoids found in tea, vegetables, soy, and dietary supplements in the intestinal absorption of therapeutic drugs.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: EFFECT OF PLANT PHENOLIC COMPOUNDS ON HUMAN COLON EPITHELIAL CELLS**

  Principal Investigator & Institution: Shiff, Steven J.; Associate Professor of Clinical Investig; Rockefeller University New York, Ny 100216399

  Timing: Fiscal Year 2002

  Summary: Colorectal cancer is a common and often fatal cancer. Primary prevention of this important public health problem is feasible because it is substantially influenced by nutritional and pharmacological factors such as dietary fat, fiber, micronutrients (i.e. calcium and selenium, aspirin (ASA), and other nonsteroidal antiinflammatory drugs. Sulindac is a potent chemopreventive agent for colorectal cancer. **Quercetin,** a plant-derived compound with anti-inflammatory properties, inhibits colon cancer development in preclinical studies. However, its effectiveness in the prevention of human colorectal cancer is unknown. NSAIDs modulate the turnover (induce cell quiescence and apoptosis) of colonic epithelial cells. This effect may be important for their efficacy as colon cancer chemopreventive agents. The goal of this study is to determine the effects sulindac and **quercetin** on the turnover of human colonic epithelial cells. By comparing and contrasting the effect of these 2 compounds on colonocytes of humans, we hope to begin to understand the effects of NSAID compounds on the physiology of the colorectal crypts of humans. Through these and future studies we eventually hope to predict the potential utility of **quercetin** as a colon cancer chemopreventive agent and to shed additional light on the mechanisms by which anti-inflammatory agents prevent colon carcinogenesis.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: FLAVONOID BIOAVAILABILITY IN HUMANS-CELLULAR STUDIES**

  Principal Investigator & Institution: Walle, Thomas; Professor; Pharmacology; Medical University of South Carolina 171 Ashley Ave Charleston, Sc 29425

  Timing: Fiscal Year 2002; Project Start 01-FEB-1998; Project End 31-JUL-2006

  Summary: (provided by applicant): The long-term goal of this research program is to increase our understanding of how cellular transport and metabolism influence the oral bioavailability of dietary flavonoids, a large class of compounds that has been implicated to play a major role in the prevention of human diseases, in particular cardiovascular disease and cancer. In Specific Aim 1 we will determine the

interrelationships between SGLT1 and MRP2, including mechanisms involved, in the enterocyte absorption of flavonoid glycosides and the tea flavonoids, two main classes of dietary flavonoids. These studies will be undertaken in SGLT1- and MRP2-transfected cells and in the human intestinal absorption model Caco-2. The role of the potentially most important transporter, i.e. MRP2, will be directly examined in vivo in the MRP2-deficient Tr- rat. In Specific Aim 2 we will investigate the interrelationships between CYPs, UGTs and SULTs, including the identification of the major isoforms involved, in the hepatic as well as intestinal metabolism of flavonoids. This will be done in microsomes as well as in intact cells, e.g. fresh human hepatocytes. These experiments will allow us to establish the major pathway(s) of metabolism of the flavonoids. In addition, autoinduction of flavonoid metabolism will be examined, mainly focusing on CYPs and UGTs. The importance of the UGT family of enzymes will be directly examined in vivo in the genetically deficient Gunn rat. In Specific Aim 3 we will determine the role and mechanisms of a) bacterial- and b) peroxidase-mediated catabolism of flavonoids, including covalent binding to protein. The experiments in a) will be conducted in gnotobiotic compared to normal rats as well as in samples from an in vivo human study. Complementary in vitro studies will include the identification of the bacterial pathway leading from **quercetin** to CO2 formation. The experiments in b) will be conducted in vitro, using pure enzymes and subcellular fractions, and then in intact cell systems in which production of reactive oxygen species as well as glutathione levels can be manipulated. Structure identification of metabolites as well as elucidation of covalent binding will be critical factors. The findings from the proposed studies should help us understand the bioavailability of the flavonoids, facilitating optimization of the chemopreventive utility of these natural or synthetic compounds.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: HEAT SHOCK PROTEINS AND DRUG RESISTANCE**

  Principal Investigator & Institution: Fuqua, Suzanne A.; Professor; University of Texas Hlth Sci Ctr San Ant 7703 Floyd Curl Dr San Antonio, Tx 78229

  Timing: Fiscal Year 2002

  Summary: Heat shock proteins (hsp's) protect cells from a variety of stresses. Human breast cancer cells may express high levels of hsp27 and hsp70 in particular, which we have found to be associated with general tumor aggressiveness. Preliminary evidence also suggests that hsp's play a role in drug resistance, and understanding the mechanisms involved could lead to clinical strategies to circumvent such resistance and improve patient survival. We initially found that heat shock increases the resistance of breast cancer cells to doxorubicin, while inducing hsp27 and hsp70. Introducing hsp27 cDNA makes the cells resistant to doxorubicin, while blocking hsp27 expression with flavones (e.g. quercitin) reverses resistance. We now need to determine whether hsp70 plays a similar role. We also plan to further investigate means of modulating hsp27 expression for therapeutic benefit by manipulating its regulatory promoter system - we have already identified key elements of the promoter region to be targeted, along with a novel DNA-binding protein which binds one of these elements. We will examine mechanisms which may be involved in the association of hsp's with drug resistance, and confirm the association in clinical breast cancer specimens from doxorubicin-resistant vs. naive patients. Our Specific Aims are: (1) To confirm our preliminary finding that hsp70 may also play a role in doxorubicin resistance in human breast cancer cells. We will use antisense oligonucleotides to inhibit expression of both hsp70 and its constitutive cognate hsc70 in breast cancer cells, and full-length cDNAs to induce overexpression, determining drug resistance in soft agar cloning assays and in vivo

nude mouse studies. (2) To further develop pharmacologic means (flavone inhibition) and molecular means (promoter studies) to circumvent hsp27-induced doxorubicin resistance. (3) To search for mechanisms associated with this resistance, focusing in particular on the role of topoisomerase II. (4) To translate these findings to the clinical setting by determining the relationship of hsp27 and hsp70 with clinical doxorubicin resistance. We will compare hsp levels in a set of 100 doxorubicin-resistant metastases vs. 100 naive breast cancer specimens, and will also correlate hsp levels with clinical outcome in a prospective, randomized adjuvant clinical trial (SWOG 8897) involving doxorubicin. All of this will prepare for a Phase I clinical trial directed at circumventing hsp-induced doxorubicin resistance using the pharmacologic agent quercitin, though the trial itself is not a part of the present proposal, and will also suggest other approaches for reversing resistance to this otherwise most useful drug in breast cancer treatment.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: IMMUNOBIOLOGY OF WALNUT FOOD ALLERGY**

  Principal Investigator & Institution: Teuber, Suzanne S.; Internal Medicine; University of California Davis Sponsored Programs, 118 Everson Hall Davis, Ca 95616

  Timing: Fiscal Year 2002; Project Start 01-MAY-1999; Project End 30-APR-2003

  Summary: Over the last ten years, genes encoding food allergens have been cloned and sequenced but no consensus sequences or motifs associated with allergy have been determined. Indeed, my lab has cloned genes encoding 2 of the major English walnut kernel allergens, the 2S albumin and a vicilin-like seed storage protein, Jug r 1 and Jug r 2, respectively. Plant seed allergy is often life-threatening and permanent. Individuals with walnut allergy, for instance, can have high levels of specific IgE against several different, non-cross-reactive proteins in their sera into their seventh decade. Most patients who have life-threatening walnut allergy have a childhood history of atopic dermatitis (AD), in which it has been demonstrated that there is more of a tendency to develop IgE against multiple environmental and food allergens. Even in the face of this however, most children with AD are tolerant of most foods. The major thesis of this proposal is that plant seed proteins, because of the way they are packaged as whole proteins in the plant protein body storage organelle with associated lectins, enzymes, and polyphenolic compounds, are able to stimulate the APC in atopic persons to modulate the cytokine milieu towards increased IL-4 and IL-13, inducing an IgE response. As a prototype seed to study, the walnut (Juglans regia) will be used based on the availability of human subjects, recombinant allergens, multiple protein preparations, fractionated polyphenolics and its importance as a tree nut allergen. To characterize the APC-T cell interaction, T cell lines will be established from individuals with walnut food allergy and individuals with atopic dermatitis without food allergy. The proliferative response and Th2 related cytokine mRNA transcription will be assessed in response to different antigen packages delivered to the APC: recombinant Jug r 1 and Jug r 2, peptide fragments, whole purified proteins (albumins and large globulins), purified protein bodies (lectins and enzymes present), total walnut extract (pellicle polyphenolics and oil body lipids present), and the above protein sources with a quantified walnut total polyphenolic fraction added (rich in **quercetin** and ellagic acid). The above data will significantly advance our knowledge of the immunobiology of plant seed allergy.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: INFLUENCE OF CRANBERRY ON PLAQUE-RELATED DISEASES**

  Principal Investigator & Institution: Koo, Hyun; Eastman Dentistry; University of Rochester Orpa - Rc Box 270140 Rochester, Ny 14627

  Timing: Fiscal Year 2004; Project Start 01-JAN-2004; Project End 30-NOV-2006

  Summary: (provided by applicant): Dental caries is the most common oral infectious disease that afflicts humans. More than 95% of all adults have experienced this disease. It is more common than asthma, hay fever or chronic bronchitis in 5-17 year old children. The American public spends close to $40 billion per year to treat this disease or its consequences. Dental caries results from the interaction of specific bacteria with constituents of the diet on a susceptible tooth surface. Dental plaque accumulation is the first clinical evidence of this interaction; dental plaque is a biofilm which is comprised of a population of bacteria growing on the tooth surface enmeshed in a polysaccharide matrix. Acid can be formed rapidly by acidogenic bacteria, such as Streptococcus mutans, within the matrix and its persistence results in dissolution of the tooth. Furthermore, plaque is also the major aetiological factor in gingivitis. Cranberries, like other natural products, harbor a plethora of biological compounds such as flavonoids (e.g. **quercetin** and myricetin), phenolic acids (benzoic acid), anthocyanins, condensed tannins, and others. We have shown that many of these substances can: (i) inhibit enzymes associated with the formation of the plaque polysaccharide matrix, (ii) block adherence of bacteria to surfaces, (iii) prevent acid formation, and (iv) reduce acid tolerance of cariogenic organisms. For example, **quercetin** and myricetin are effective inhibitors of glucosyltransferases (GTFs), enzymes responsible for the synthesis of glucans; glucans synthesized by GTFs mediate the adherence and accumulation of cariogenic streptococci on the tooth surface. Weak acids, such as benzoate (benzoic acid), affect the acid production by S. mutans and have been shown to reduce dental caries in rats. We propose a comprehensive plan to explore the influence of cranberry on many of the biological aspects involved in the pathogenesis of dental plaque formation and caries. We also propose to examine the ability of cranberry to prevent or reduce caries in our well-proven rodent model and to investigate the effects of cranberry on plaque formation and gingivitis in vivo.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: INFLUENCE OF DIETARY FLAVONOIDS ON THE EXPRESSION OF AT***

  Principal Investigator & Institution: Keen, Carl L.; Professor and Chairman; Nutrition; University of California Davis Sponsored Programs, 118 Everson Hall Davis, Ca 95616

  Timing: Fiscal Year 2002; Project Start 15-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant) Oxidative stress is characterized by excessive concentrations of reactive oxygen and reactive nitrogen species (ROS and RNS). Excessive oxidative damage has been implicated in the pathogenesis of numerous degenerative diseases including coronary vascular diseases (CVD). A current hypothesis suggests that ROS, RNS and oxidized LDL (ox-LDL) induce the expression of atherogenic genes via redox-sensitive signaling pathways. The oxidative stress-induced gene expression has been shown to be mediated via the activation of redox sensitive transcription factors such as nuclear factor- kappaBeta (NFkB), and redox-sensitive transduction pathways such as those involving members of the mitogen activated protein kinase (MAPK) family as well as members of the Src family. Genes regulated by NFkB activation encode for proteins implicated in acute phase and inflammatory responses including certain cytokines and chemokines, cell adhesion molecules and

inflammatory enzymes; several of these molecules are involved in the pathogenesis of atherosclerosis. Similarly, studies have shown that JNK, BMK-1 and cSrc are involved in signaling events stimulated by ROS that contribute to atherosclerosis such as smooth muscle cell proliferation. It is well known that diet plays a important role in a large number of chronic diseases. The investigators suggest that this is due in part to an effect of diet on a individual's antioxidant status. Vitamins and minerals contribute to the oxidative defense system because: (1) they are antioxidants (vitamins E, C and B-carotene); (2) they are essential for the function of enzyme antioxidants (Zn, Cu, Fe, Mn, Se and riboflavin); or (3) they act to maintain low levels of potentially pro-oxidant molecules (vitamins B12, B6 and folate). On the other hand, the cardio-protective effects of flavonoids result in part from their antioxidant properties, and their ability to modulate the activity of a wide spectrum of enzymes. The researchers propose to investigate the hypothesis that diet may influence vascular redox-mediated signaling and transcriptional activities. Using the mouse model, they will test the hypothesis that a diet marginal in select micronutrients will induce a pro-oxidative state that will worsen the pathophysiological state of atherosclerosis. Finally, they will test the hypothesis that addition of flavonoids to diets marginal in antioxidants will attenuate the atherogenic effect of the pro-oxidative effect of micronutrient deficiency and hypercholesterolemia. These issues will be addressed using mutant mice in which the LDL receptor (LDLr) has been inactivated. The researchers will measure the progression of atherosclerosis in LDLr +/+ and -/- mice fed a high fat-micronutrient adequate diet, or a high fat-micronutrient marginal diet, supplemented or not with the flavonoids, **quercetin** and catechin. They will use biochemical markers and immunohistochemistry to evaluate antioxidant capacity and redox status in the LDLr mice, and correlate these with the severity of atherosclerosis determined by lesion progression and atherogenic gene expression. Finally, they will examine the effects of the diets on the activation of NFkB and cell signaling pathways.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: INTERACTION BETWEEN IRINOTECAN AND DIETARY FLAVONOIDS**

  Principal Investigator & Institution: Iyer, Lalitha V.; Sri International 333 Ravenswood Ave Menlo Park, Ca 940253493

  Timing: Fiscal Year 2003; Project Start 18-AUG-2003; Project End 31-JUL-2005

  Summary: (provided by applicant): Over 50% of cancer patients use alternative medicines regularly while undergoing chemotherapy. These products, though derived from natural sources, may contain active ingredients that may influence the disposition and/or therapeutic outcome of concomitantly administered chemotherapeutics. This application will address the issue of drug/botanical interaction between the anticancer agent irinotecan (used against colorectal cancer) and the popular dietary flavonoids from soy (genistein and daidzein) and fruits and vegetables (chrysin and quercetin). Irinotecan has complex dispositional characteristics, with sequential metabolic activation and inactivation steps, biliary and urinary excretion. The PI has studied some of these pathways extensively and has shown that the enzyme UGT1A1 glucuronidates its active metabolite, SN-38, and that the multidrug resistance transporter, p-glycoprotein (P-gp), plays a major role in irinotecan's biliary excretion. Flavonoids such as chrysin and **quercetin** are known inducers of UGT1A1. Our hypothesis are that (i) the selected dietary flavonoids will influence the disposition and toxicity of irinotecan via induction of the glucuronidation (by UGT1A1) of its active metabolite, SN-38; and (ii) induction of UGT1A1 by dietary flavonoids is influenced by genetic differences in the

promoter region of the UGT1A1 gene. The specific aims are to (1) investigate the in vivo interaction of soy isoflavones, chrysin and **quercetin** with irinotecan in rats, (2) determine whether hepatic UGT1A1 induction by flavonoids is responsible for their interaction with irinotecan, and (3) investigate the influence of the TATA polymorphism in the promoter region of UGT1A1 on inducibility by these flavonoids. Aim 1 will involve in vivo pharmacokinetic, biliary, and urinary excretion studies with irinotecan after chronic pretreatment of rats with the selected dietary flavonoids. The potential induction of UGT1A1 will be studied in Aim 2 by measuring SN-38 glucuronidation in hepatocytes and liver microsomes from flavonoid treated rats, as well as by measuring UGT1A1 protein levels. In Aim 3, luciferase reporter assays will be performed to investigate UGT1A1 activity after pretreatment with flavonoids in Hep G2 cells transfected with known polymorphic forms (TA5,TA6,TA7,TA8) of the TATA sequence of UGT1A1. As irinotecan has a narrow therapeutic index, minor changes in its disposition can significantly modify the therapeutic outcome, so this investigation will have major potential benefits to cancer patients and oncologists. This pilot/developmental project will generate significant preliminary results to propose larger (R01) grants being planned by the PI and colleagues on the interaction between natural medications & dietary supplements and conventional chemotherapy, and its pharmacogenetic implications.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: LISTERIA AND SHIGELLA USE HOST CELL ACTIN**

  Principal Investigator & Institution: Southwick, Frederick S.; Professor; Medicine; University of Florida Gainesville, Fl 32611

  Timing: Fiscal Year 2002; Project Start 01-JUL-1993; Project End 31-MAY-2007

  Summary: (provided by applicant): The gram-positive bacillus Listeria monocytogenes predominantly infects immunocompromised patients, causing bacteremia and meningitis while the gram-negative bacillus Shigella flexneri infects normal hosts causing severe diarrhea and dehydration. The pathogenesis of Listeriosis and Shigellosis absolutely requires these intracellular bacteria to usurp the host cell's contractile system. Listeria and Shigella induce host cell actin to assemble into rocket tails that rapidly propel the bacteria through the cytoplasm, allowing their cell-to-cell spread and avoidance of the humoral immune system. Actin assembly occurs in a discrete polymerization zone directly behind the motile bacteria. This region blocks the host cell actin-regulatory proteins, gelsolin, CapZ and CapG, that normally cap the fast growing ends of actin filaments. This blocking activity allows actin filaments to rapidly assemble in this discrete zone. Two of these proteins, gelsolin and CapG, require micromolar calcium to function. We will: Aim I - Elucidate how Listeria blocks barbed end-capping proteins in the polymerization zone. Pyrenyl actin and right angle light scattering will be used to examine how profilin combined PIP2 and VASP or N-WASP effects actin filament capping by CapG, CapZ and gelsolin. Capping inhibition by Listeria will be investigated in brain cell free extracts before and after depletion of profilin and VASP. Localization of PIP2 (well known to block capping activity) in Listeria and Shigella infected cells will be studied using a GFP labeled probe. The effects of blocking PIP2 production using the PI kinase inhibitors Wortmannin and **quercetin,** infecting cells with Listeria ActA mutants lacking PIP2 binding sites, and ActA mutants lacking VASP binding sites will be examined. Aim II - Study the Calcium-Dependence of Listeria and Shigella actin-based motility. Calcium is a critical signal for turning on and off actin regulatory proteins, and we have found that the chelator BAPTAM blocks Shigella actin-based motility and slows the disassembly of Listeria rocket tails. The Ca2+-sensitivity of

N-WASP and vinculin, cell proteins unique to Shigella-induced actin assembly, as well as gelsolin will be studied. These investigations should clarify key regulatory pathways required for Listeria- and Shigella-induced actin assembly and may identify new therapeutic targets for treating Listeriosis and Shigellosis.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: NO:ROLE IN VASCULAR PROTECTION BY POLYPHENOLS & ALCOHOL**

  Principal Investigator & Institution: Parks, Dale A.; Professor; Anesthesiology; University of Alabama at Birmingham Uab Station Birmingham, Al 35294

  Timing: Fiscal Year 2002; Project Start 01-APR-2002; Project End 31-MAR-2006

  Summary: The interaction of dietary components, such as the polyphenols and alcohol, on chronic diseases, particularly those of the cardiovascular system, is only recently emerging. This is a key area since considerable epidemiological evidence indicates that consumption of moderate levels of alcoholic beverages, particularly red wine, decreases both the incidence of cardiovascular disease and the mortality associated with myocardial infarction. Molecular mechanisms of this cardiovascular protection remain uncertain but appear to involve complex interactions of these components with cells in the vascular wall. The main attribute of the polyphenols that have been forwarded to explain these protective effects has been their antioxidant properties. Data forming the foundation of this proposal indicate an interesting elaboration of the hypothesis that polyphenols act as antioxidants, particularly in conjunction with ethanol. It is proposed that transcriptional regulation of the concentration and activity of critical vascular protective enzymes makes a major contribution to the enhanced cardiovascular protective effects and is more pronounced in combination with ethanol. The main effect of the enhanced endogenous cytoprotective enzymes is to increase the bioavailability of nitric oxide (NO). Preliminary data shows that dietary polyphenols and alcohol (1) enhance NO-dependent vascular function (2) increase expression of nitric oxide synthases (NOS) mRNA in the vasculature; (3) induce protein expression of both iNOS and eNOS isoforms in the vasculature; (4) induce vascular superoxide dismutases (SOD); and (5) that increased bioavail- ability of NO may be responsible for the cardiovascular protection. These data have led to the hypothesis that "moderate alcohol or dietary polyphenols will increased NO bioavailability and play a pivotal role in conferring vascular protection". This hypothesis will be tested by completion of the following Specific Aims: (1) induction of NOS by dietary polyphenols and moderate alcohol increases bioavailability of NO and results in vascular protection, (2) induction of SOD and a consequent decrease in superoxide (O2-.) by dietary polyphenols and moderate alcohol increases the bioavailability of NO and results in vascular protection, and (3) polyphenol supplementation results in vascular protection due to both increased bioavailability of NO and a consequent decreased susceptibility to pro-inflammatory oxidants. The completion of these specific aims will provide insight into the mechanisms that lead to increased NO and role that these NO-dependent mechanisms play in the cardiovascular protection associated with polyphenols and alcohol.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: PAI-1 GENE EPRESSION BY ETHANOL AND POLYPHENOLS**

  Principal Investigator & Institution: Grenett, Hernan E.; University of Alabama at Birmingham Uab Station Birmingham, Al 35294

  Timing: Fiscal Year 2003; Project Start 01-JUL-2003; Project End 30-JUN-2008

Summary: Epidemiological studies demonstrate that consuming alcohol or red wine moderately, 1-4 drinks/day, reduces the risk for CHD-related mortality. Furthermore, these studies show that this cardioprotection may be due, in part, to increased fibrinolysis. Endothelial cells (ECs) regulate fibrinolysis through the synthesis of plasminogen activators (PAs, t-PA and u-PA) and plasminogen activator inhibitor type-1 (PAI-1), the major physiological regulator of fibrinolysis. In addition ECs serve as the main site of surface-localized fibrinolysis that regulates homeostasis. Thus, ECs and PAI-1 plays a pivotal role both in fibrinolytic homeostasis and in the pathogenesis of CHD and MI. Reduction in plasma PAI-1 levels by systemic factors, such as alcohol and wine polyphenols, will increase fibrinolysis and hence reduce the risk for thrombosis, CHD and eventual MI. Our preliminary studies demonstrate that consuming moderate ethanol or polyphenols (catechin, quercetin) reduces in vivo expression of both PAl-1 protein and mRNA in wild type C57BL/6J mice. Our in vitro experiments show that ethanol down-regulates PAI-1 gene transcription in a time- and dose-dependent manner concomitant with increased expression of fibrinolytic activity in cultured human ECs. Furthermore, we have identified a 251-bp promoter fragment in the PAI-1 gene that mediates this ethanol-induced suppression of PAI-1 expression. Thus, the overall goal of Project 2 is to identify the molecular mechanisms through which ethanol/polyphenols repress PAI-1 gene expression in vivo and in vitro, resulting in increased fibrinolysis. Specific studies will determine the effect of ethanol/polyphenols on the in vivo expression and role of PAI-1 in and deficient PAI-1 mice (Aim 1); examine possible cross-talk between PAI-1 and eNOS in regulating vascular function in wild-type and PAI-1 deficient mice (Aim 2); establish the role of vitronectin, LRP, VLDLr, and alpha5beta3 in modulating PAI-1 in cultured ECs (Aim 3); and identify the ethanol/polyphenols responsive cis-element(s) in the PAI-1 gene, and characterize the transcription factor(s) that bind these responsive cis-element(s) (Aim 4). Results from these studies will provide insight into understanding how moderate ethanol/polyphenols repress PAI-1 gene transcription that may contribute to increased fibrinolysis and the cardioprotection attributed to moderate alcohol and red wine consumption.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: POLYPHENOLS AND INFLAMMATION**

  Principal Investigator & Institution: Barnes, Stephen; Professor and Director, Uab Center for n; Purdue University West Lafayette West Lafayette, in 479072040

  Timing: Fiscal Year 2002

  Summary: Polyphenols are common constituents in botanical preparations available in over-the-counter preparations as well as in foods which are being recommended as being heart-healthy or cancer preventing. Although best known as antioxidants, their mechanisms of action also appear to include the estrogen receptor system and inhibition of protein kinases that form part of signal transduction cascades. However, the low blood concentrations of free polyphenols in blood are not consistent with their observed effects in animal models of chronic disease. This suggests that further metabolism occurs in the vicinity of the cells affected by the chronic disease, Since chronic disease is characterized by local production of oxidants, we hypothesize that the polyphenols are converted by the oxidants to novel metabolites with increased biologic activity. Specifically, we propose that polyphenols react with hypohalogenous acids (HOCl and HOBr) and with and with peroxynitrite to produce halogenated products. Using soy isoflavones as a model, we have already shown that they form mono- and dichlorinated and nitrated derivatives both in vitro and in cells induced to have respiratory bursts.

The goals of this project are to determine (1) the products and rates of reaction of polyphenols with HOCl, HOBr and ONO2- using LC-MSMS and NMR; (2) the kinetics of the formation of halogenated and nitrated products of polyphenols and their physiological metabolites by inflammatory cells; (c) whether nitrated and/or halogenated polyphenols are found in tissue sites in animal models of cells; (3) whether nitrated and/or halogenated polyphenols are found in tissue sites in animal models of inflammatory disease; and (4) the effect of halogenation of polyphenols on their biochemical and biological action in model systems (cell proliferation, arterial vessel relaxation, EGF receptor autophosphorylation and estrogen receptor-dependent reporter gene expression). The polyphenols chosen for these experiments will be those that are the subject of research in the other main projects (daidzein and genistein) [Project 1], **quercetin,** reveratrol, and pro-anthrocyanins [Project 2] and tea polyphenols [Project 3]. In particular, the known metabolites of these polyphenols will be investigated. Polyphenols will be investigated. Polyphenols in botanical preparations developed via the activities of the Cores and the Pilot projects will also be evaluated in years 2-5.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THE CAROTENE AND RETINOL EFFICACY TRIAL (CARET)**

  Principal Investigator & Institution: Goodman, Gary E.; Associate Professor; Fred Hutchinson Cancer Research Center Box 19024, 1100 Fairview Ave N Seattle, Wa 98109

  Timing: Fiscal Year 2002; Project Start 01-JUL-1994; Project End 31-MAY-2004

  Summary: This abstract is not available.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

E-Journals: PubMed Central[3]

PubMed Central (PMC) is a digital archive of life sciences journal literature developed and managed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM).[4] Access to this growing archive of e-journals is free and unrestricted.[5] To search, go to **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Pmc**, and type "quercetin" (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for quercetin in the PubMed Central database:

- **Action of 3-methylquercetin on poliovirus RNA replication.** by Castrillo JL, Carrasco L.; 1987 Oct;
  http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=255917

[3] Adapted from the National Library of Medicine: **http://www.pubmedcentral.nih.gov/about/intro.html**.

[4] With PubMed Central, NCBI is taking the lead in preservation and maintenance of open access to electronic literature, just as NLM has done for decades with printed biomedical literature. PubMed Central aims to become a world-class library of the digital age.

[5] The value of PubMed Central, in addition to its role as an archive, lies in the availability of data from diverse sources stored in a common format in a single repository. Many journals already have online publishing operations, and there is a growing tendency to publish material online only, to the exclusion of print.

- **Anaerobic enzyme[center dot]substrate structures provide insight into the reaction mechanism of the copper-dependent quercetin 2,3-dioxygenase.** by Steiner RA, Kalk KH, Dijkstra BW.; 2002 Dec 24;
  http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=139194
- **Biotransformation of the Pentahydroxy Flavone Quercetin by Rhizobium loti and Bradyrhizobium Strains (Lotus).** by Rao JR, Sharma ND, Hamilton JT, Boyd DR, Cooper JE.; 1991 May;
  http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=182986
- **Degradation of Quercetin and Luteolin by Eubacterium ramulus.** by Braune A, Gutschow M, Engst W, Blaut M.; 2001 Dec;
  http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=93344
- **Microbial Transformation of Quercetin by Bacillus cereus.** by Rao KV, Weisner NT.; 1981 Sep;
  http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=244035
- **Quercetin inhibits Ca2+ uptake but not Ca2+ release by sarcoplasmic reticulum in skinned muscle fibers.** by Shoshan V, Campbell KP, MacLennan DH, Frodis W, Britt BA.; 1980 Aug;
  http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=349858
- **Rutin-induced beta-glucosidase activity in Streptococcus faecium VGH-1 and Streptococcus sp. strain FRP-17 isolated from human feces: formation of the mutagen, quercetin, from rutin.** by MacDonald IA, Bussard RG, Hutchison DM, Holdeman LV.; 1984 Feb;
  http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=239673

The National Library of Medicine: PubMed

One of the quickest and most comprehensive ways to find academic studies in both English and other languages is to use PubMed, maintained by the National Library of Medicine.[6] The advantage of PubMed over previously mentioned sources is that it covers a greater number of domestic and foreign references. It is also free to use. If the publisher has a Web site that offers full text of its journals, PubMed will provide links to that site, as well as to sites offering other related data. User registration, a subscription fee, or some other type of fee may be required to access the full text of articles in some journals.

To generate your own bibliography of studies dealing with quercetin, simply go to the PubMed Web site at **http://www.ncbi.nlm.nih.gov/pubmed**. Type "quercetin" (or synonyms) into the search box, and click "Go." The following is the type of output you can expect from PubMed for quercetin (hyperlinks lead to article summaries):

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[6] PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) at the National Institutes of Health (NIH). The PubMed database was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journal articles at Web sites of participating publishers. Publishers that participate in PubMed supply NLM with their citations electronically prior to or at the time of publication.

- **Absorption and antioxidant effects of quercetin from onions, in man.**
  Author(s): McAnlis GT, McEneny J, Pearce J, Young IS.
  Source: European Journal of Clinical Nutrition. 1999 February; 53(2): 92-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10099940

- **Absorption and disposition kinetics of the dietary antioxidant quercetin in man.**
  Author(s): Hollman PC, vd Gaag M, Mengelers MJ, van Trijp JM, de Vries JH, Katan MB.
  Source: Free Radical Biology & Medicine. 1996; 21(5): 703-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8891673

- **Absorption and excretion of conjugated flavonols, including quercetin-4'-O-beta-glucoside and isorhamnetin-4'-O-beta-glucoside by human volunteers after the consumption of onions.**
  Author(s): Aziz AA, Edwards CA, Lean ME, Crozier A.
  Source: Free Radical Research. 1998 September; 29(3): 257-69.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9802557

- **Absorption of dietary quercetin glycosides and quercetin in healthy ileostomy volunteers.**
  Author(s): Hollman PC, de Vries JH, van Leeuwen SD, Mengelers MJ, Katan MB.
  Source: The American Journal of Clinical Nutrition. 1995 December; 62(6): 1276-82.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7491892

- **Absorption/metabolism of sulforaphane and quercetin, and regulation of phase II enzymes, in human jejunum in vivo.**
  Author(s): Petri N, Tannergren C, Holst B, Mellon FA, Bao Y, Plumb GW, Bacon J, O'Leary KA, Kroon PA, Knutson L, Forsell P, Eriksson T, Lennernas H, Williamson G.
  Source: Drug Metabolism and Disposition: the Biological Fate of Chemicals. 2003 June; 31(6): 805-13.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12756216

- **Accumulation of quercetin conjugates in blood plasma after the short-term ingestion of onion by women.**
  Author(s): Moon JH, Nakata R, Oshima S, Inakuma T, Terao J.
  Source: American Journal of Physiology. Regulatory, Integrative and Comparative Physiology. 2000 August; 279(2): R461-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10938233

- **Action of 3-methylquercetin on poliovirus RNA replication.**
  Author(s): Castrillo JL, Carrasco L.
  Source: Journal of Virology. 1987 October; 61(10): 3319-21.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2442414

- **Activation of rutin by human oral bacterial isolates to the carcinogen-mutagen quercetin.**
  Author(s): Parisis DM, Pritchard ET.
  Source: Archives of Oral Biology. 1983; 28(7): 583-90.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6579892

- **An improved synthesis of the anti-picornavirus flavone 3-O-methylquercetin.**
  Author(s): Boers F, Deng BL, Lemiere G, Lepoivre J, De Groot A, Dommisse R, Vlietinck AJ.
  Source: Archiv Der Pharmazie. 1997 October; 330(9-10): 313-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9396391

- **An investigation of functional similarities between the sarcoplasmic reticulum and platelet calcium-dependent adenosinetriphosphatases with the inhibitors quercetin and calmidazolium.**
  Author(s): Fischer TH, Campbell KP, White GC 2nd.
  Source: Biochemistry. 1987 December 1; 26(24): 8024-30.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2962642

- **Anaerobic transformation of quercetin-3-glucoside by bacteria from the human intestinal tract.**
  Author(s): Schneider H, Schwiertz A, Collins MD, Blaut M.
  Source: Archives of Microbiology. 1999 January; 171(2): 81-91.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9914304

- **Antimicrobial and anti-lipase activity of quercetin and its C2-C16 3-O-acyl-esters.**
  Author(s): Gatto MT, Falcocchio S, Grippa E, Mazzanti G, Battinelli L, Nicolosi G, Lambusta D, Saso L.
  Source: Bioorganic & Medicinal Chemistry. 2002 February; 10(2): 269-72.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11741775

- **Antioxidants and cancer, part 3: quercetin.**
  Author(s): Lamson DW, Brignall MS.
  Source: Alternative Medicine Review : a Journal of Clinical Therapeutic. 2000 June; 5(3): 196-208. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10869101

- **Antioxidative flavonoid quercetin: implication of its intestinal absorption and metabolism.**
  Author(s): Murota K, Terao J.
  Source: Archives of Biochemistry and Biophysics. 2003 September 1; 417(1): 12-7. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12921774

- **Antiproliferative activity of quercetin on normal bone marrow and leukaemic progenitors.**
  Author(s): Larocca LM, Teofili L, Leone G, Sica S, Pierelli L, Menichella G, Scambia G, Benedetti Panici P, Ricci R, Piantelli M, et al.
  Source: British Journal of Haematology. 1991 December; 79(4): 562-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1772777

- **Assessment of the adaptive response induced by quercetin using the MNCB peripheral blood human lymphocytes assay.**
  Author(s): Oliveira NG, Neves M, Rodrigues AS, Monteiro Gil O, Chaveca T, Rueff J.
  Source: Mutagenesis. 2000 January; 15(1): 77-83.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10640534

- **Binding of quercetin with human serum albumin: a critical spectroscopic study.**
  Author(s): Sengupta B, Sengupta PK.
  Source: Biopolymers. 2003; 72(6): 427-34.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14587065

- **Bioavailabilities of quercetin-3-glucoside and quercetin-4'-glucoside do not differ in humans.**
  Author(s): Olthof MR, Hollman PC, Vree TB, Katan MB.
  Source: The Journal of Nutrition. 2000 May; 130(5): 1200-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10801919

- **Bioavailability of the dietary antioxidant flavonol quercetin in man.**
  Author(s): Hollman PC, van Trijp JM, Mengelers MJ, de Vries JH, Katan MB.
  Source: Cancer Letters. 1997 March 19; 114(1-2): 139-40.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9103273

- **Bioflavonoids: proanthocyanidins and quercetin and their potential roles in treating musculoskeletal conditions.**
  Author(s): Teixeira S.
  Source: The Journal of Orthopaedic and Sports Physical Therapy. 2002 July; 32(7): 357-63. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12113470

- **Biomarkers for exposure to dietary flavonoids: a review of the current evidence for identification of quercetin glycosides in plasma.**
  Author(s): Day AJ, Williamson G.
  Source: The British Journal of Nutrition. 2001 August; 86 Suppl 1: S105-10. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11520427

- **Biphasic modulation of cell proliferation by quercetin at concentrations physiologically relevant in humans.**
  Author(s): van der Woude H, Gliszczynska-Swiglo A, Struijs K, Smeets A, Alink GM, Rietjens IM.
  Source: Cancer Letters. 2003 October 8; 200(1): 41-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14550951

- **Blockade of the epidermal growth factor receptor tyrosine kinase activity by quercetin and luteolin leads to growth inhibition and apoptosis of pancreatic tumor cells.**
  Author(s): Lee LT, Huang YT, Hwang JJ, Lee PP, Ke FC, Nair MP, Kanadaswam C, Lee MT.
  Source: Anticancer Res. 2002 May-June; 22(3): 1615-27.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12168845

- **Carbon dioxide is the major metabolite of quercetin in humans.**
  Author(s): Walle T, Walle UK, Halushka PV.
  Source: The Journal of Nutrition. 2001 October; 131(10): 2648-52.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11584085

- **Cellular uptake of dietary flavonoid quercetin 4'-beta-glucoside by sodium-dependent glucose transporter SGLT1.**
  Author(s): Walgren RA, Lin JT, Kinne RK, Walle T.
  Source: The Journal of Pharmacology and Experimental Therapeutics. 2000 September; 294(3): 837-43.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10945831

- **Chlorogenic acid, quercetin-3-rutinoside and black tea phenols are extensively metabolized in humans.**
  Author(s): Olthof MR, Hollman PC, Buijsman MN, van Amelsvoort JM, Katan MB.
  Source: The Journal of Nutrition. 2003 June; 133(6): 1806-14. Erratum In: J Nutr. 2003 August; 133(8): 2692.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12771321

- **Column-switching high-performance liquid chromatographic assay for the determination of quercetin in human urine with ultraviolet absorbance detection.**
  Author(s): Nielsen SE, Dragsted LO.
  Source: J Chromatogr B Biomed Sci Appl. 1998 April 10; 707(1-2): 81-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9613936

- **Comparison of antioxidative capacities and inhibitory effects on cholesterol biosynthesis of quercetin and potential metabolites.**
  Author(s): Glasser G, Graefe EU, Struck F, Veit M, Gebhardt R.
  Source: Phytomedicine : International Journal of Phytotherapy and Phytopharmacology. 2002 January; 9(1): 33-40.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11924762

- **Comparison of arildone and 3-methylquercetin as stabilizers of poliovirus.**
  Author(s): Rombaut B, Vrijsen R, Boeye A.
  Source: Antiviral Research. 1985; Suppl 1: 67-73.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3002268

- **Concentration and effect of quercetin.**
  Author(s): Larocca LM, Piantelli M, Teofili L, Leone G, Ranelletti FO.
  Source: Experimental Hematology. 1996 March; 24(4): 494-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8608798

- **Conjugation position of quercetin glucuronides and effect on biological activity.**
  Author(s): Day AJ, Bao Y, Morgan MR, Williamson G.
  Source: Free Radical Biology & Medicine. 2000 December 15; 29(12): 1234-43.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11118813

- **Consumption of black currants, lingonberries and bilberries increases serum quercetin concentrations.**
  Author(s): Erlund I, Marniemi J, Hakala P, Alfthan G, Meririnne E, Aro A.
  Source: European Journal of Clinical Nutrition. 2003 January; 57(1): 37-42.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12548295

- **Consumption of quercetin and kaempferol in free-living subjects eating a variety of diets.**
  Author(s): de Vries JH, Janssen PL, Hollman PC, van Staveren WA, Katan MB.
  Source: Cancer Letters. 1997 March 19; 114(1-2): 141-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9103274

- **Cooperation of quercetin with ascorbate in the protection of photosensitized lysis of human erythrocytes in the presence of hematoporphyrin.**
  Author(s): Sorata Y, Takahama U, Kimura M.
  Source: Photochemistry and Photobiology. 1988 August; 48(2): 195-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3222330

- **Degradation of quercetin and luteolin by Eubacterium ramulus.**
  Author(s): Braune A, Gutschow M, Engst W, Blaut M.
  Source: Applied and Environmental Microbiology. 2001 December; 67(12): 5558-67.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11722907

- **Degradation of quercetin-3-glucoside in gnotobiotic rats associated with human intestinal bacteria.**
  Author(s): Schneider H, Simmering R, Hartmann L, Pforte H, Blaut M.
  Source: Journal of Applied Microbiology. 2000 December; 89(6): 1027-37.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11123476

- **Determination of quercetin and kaempferol in human urine after orally administrated tablet of ginkgo biloba extract by HPLC.**
  Author(s): Wang FM, Yao TW, Zeng S.
  Source: Journal of Pharmaceutical and Biomedical Analysis. 2003 September 19; 33(2): 317-21.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12972097

- **Determination of quercetin in human plasma by HPLC with spectrophotometric or electrochemical detection.**
  Author(s): Jones DJ, Lim CK, Ferry DR, Gescher A.
  Source: Biomedical Chromatography : Bmc. 1998 July-August; 12(4): 232-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9667028

- **Determination of quercetin in human plasma using reversed-phase high-performance liquid chromatography.**
  Author(s): Liu B, Anderson D, Ferry DR, Seymour LW, de Takats PG, Kerr DJ.
  Source: Journal of Chromatography. B, Biomedical Applications. 1995 April 7; 666(1): 149-55.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7655613

- **Dietary flavonoids as antioxidants in vivo: conjugated metabolites of (-)-epicatechin and quercetin participate in antioxidative defense in blood plasma.**
  Author(s): Terao J.
  Source: J Med Invest. 1999 August; 46(3-4): 159-68. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10687310

- **Dietary flavonols quercetin and kaempferol are ligands of the aryl hydrocarbon receptor that affect CYP1A1 transcription differentially.**
  Author(s): Ciolino HP, Daschner PJ, Yeh GC.
  Source: The Biochemical Journal. 1999 June 15; 340 (Pt 3): 715-22.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10359656

- **Dietary intakes of flavonols, flavones and isoflavones by Japanese women and the inverse correlation between quercetin intake and plasma LDL cholesterol concentration.**
  Author(s): Arai Y, Watanabe S, Kimira M, Shimoi K, Mochizuki R, Kinae N.
  Source: The Journal of Nutrition. 2000 September; 130(9): 2243-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10958819

- **Dietary quercetin augments activator protein-1 and does not reduce nuclear factor-kappa B in the renal cortex of rats with established chronic glomerular disease.**
  Author(s): Rangan GK, Wang Y, Harris DC.
  Source: Nephron. 2002 March; 90(3): 313-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11867952

- **Dietary quercetin glycosides: antioxidant activity and induction of the anticarcinogenic phase II marker enzyme quinone reductase in Hepalclc7 cells.**
  Author(s): Williamson G, Plumb GW, Uda Y, Price KR, Rhodes MJ.
  Source: Carcinogenesis. 1996 November; 17(11): 2385-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8968052

- **Dietary supplementation with the anti-tumour promoter quercetin: its effects on matrix metalloproteinase gene regulation.**
  Author(s): Morrow DM, Fitzsimmons PE, Chopra M, McGlynn H.
  Source: Mutation Research. 2001 September 1; 480-481: 269-76.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11506819

- **Differential apoptosis-inducing effect of quercetin and its glycosides in human promyeloleukemic HL-60 cells by alternative activation of the caspase 3 cascade.**
  Author(s): Shen SC, Chen YC, Hsu FL, Lee WR.
  Source: Journal of Cellular Biochemistry. 2003 August 1; 89(5): 1044-55.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12874837

- **Differential effects of quercetin and resveratrol on Band 3 tyrosine phosphorylation signalling of red blood cells.**
  Author(s): Maccaglia A, Mallozzi C, Minetti M.
  Source: Biochemical and Biophysical Research Communications. 2003 June 6; 305(3): 541-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12763027

- **Differential inhibition of human liver and duodenum sulphotransferase activities by quercetin, a flavonoid present in vegetables, fruit and wine.**
  Author(s): Marchetti F, De Santi C, Vietri M, Pietrabissa A, Spisni R, Mosca F, Pacifici GM.
  Source: Xenobiotica; the Fate of Foreign Compounds in Biological Systems. 2001 December; 31(12): 841-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11780759

- **Differential responses of skin cancer-chemopreventive agents silibinin, quercetin, and epigallocatechin 3-gallate on mitogenic signaling and cell cycle regulators in human epidermoid carcinoma A431 cells.**
  Author(s): Bhatia N, Agarwal C, Agarwal R.
  Source: Nutrition and Cancer. 2001; 39(2): 292-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11759294

- **Differential sensitivity of leukemic and normal hematopoietic progenitors to the killing effect of hyperthermia and quercetin used in combination: role of heat-shock protein-70.**
  Author(s): Larocca LM, Ranelletti FO, Maggiano N, Rutella S, La Barbera EO, Rumi C, Serra F, Voso MT, Piantelli M, Teofili L, Leone G.
  Source: International Journal of Cancer. Journal International Du Cancer. 1997 September 26; 73(1): 75-83.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9334813

- **Disposition of quercetin in man after single oral and intravenous doses.**
  Author(s): Gugler R, Leschik M, Dengler HJ.
  Source: European Journal of Clinical Pharmacology. 1975 December 19; 9(2-3): 229-34.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1233267

- **Distinct mechanisms of DNA damage in apoptosis induced by quercetin and luteolin.**
  Author(s): Yamashita N, Kawanishi S.
  Source: Free Radical Research. 2000 November; 33(5): 623-33.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11200093

- **DNA damage in human colonic mucosa cells evoked by nickel and protective action of quercetin - involvement of free radicals?**
  Author(s): Blasiak J, Arabski M, Pertynski T, Malecka-Panas E, Wozniak K, Drzewoski J.
  Source: Cell Biology and Toxicology. 2002; 18(4): 279-88.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12206140

- **Downregulation of COX-2 and iNOS by amentoflavone and quercetin in A549 human lung adenocarcinoma cell line.**
  Author(s): Banerjee T, Van der Vliet A, Ziboh VA.
  Source: Prostaglandins, Leukotrienes, and Essential Fatty Acids. 2002 May-June; 66(5-6): 485-92.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12144868

- **Drug resistance against gemcitabine and topotecan mediated by constitutive hsp70 overexpression in vitro: implication of quercetin as sensitiser in chemotherapy.**
  Author(s): Sliutz G, Karlseder J, Tempfer C, Orel L, Holzer G, Simon MM.
  Source: British Journal of Cancer. 1996 July; 74(2): 172-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8688318

- **Effect of an antioxidant (quercetin) on sodium-lauryl-sulfate-induced skin irritation.**
  Author(s): Katsarou A, Davoy E, Xenos K, Armenaka M, Theoharides TC.
  Source: Contact Dermatitis. 2000 February; 42(2): 85-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10703630

- **Effect of bile acids on formation of the mutagen, quercetin, from two flavonol glycoside precursors by human gut bacterial preparations.**
  Author(s): Mader JA, Macdonald IA.
  Source: Mutation Research. 1985 March; 155(3): 99-104.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3883158

- **Effect of dietary quercetin on oxidative DNA damage in healthy human subjects.**
  Author(s): Beatty ER, O'Reilly JD, England TG, McAnlis GT, Young IS, Geissler CA, Sanders TA, Wiseman H.
  Source: The British Journal of Nutrition. 2000 December; 84(6): 919-25.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11177210

- **Effect of fruit juice intake on urinary quercetin excretion and biomarkers of antioxidative status.**
  Author(s): Young JF, Nielsen SE, Haraldsdottir J, Daneshvar B, Lauridsen ST, Knuthsen P, Crozier A, Sandstrom B, Dragsted LO.
  Source: The American Journal of Clinical Nutrition. 1999 January; 69(1): 87-94.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9925128

- **Effect of genistein and quercetin on proliferation, collagen synthesis, and type I procollagen mRNA levels of rat hepatic stellate cells.**
  Author(s): Kang LP, Qi LH, Zhang JP, Shi N, Zhang M, Wu TM, Chen J.
  Source: Acta Pharmacologica Sinica. 2001 September; 22(9): 793-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11749858

- **Effect of pH on quercetin-induced suppression of heat shock gene expression and thermotolerance development in HT-29 cells.**
  Author(s): Lee YJ, Curetty L, Hou ZZ, Kim SH, Kim JH, Corry PM.
  Source: Biochemical and Biophysical Research Communications. 1992 July 31; 186(2): 1121-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1497645

- **Effect of plasma metabolites of (+)-catechin and quercetin on monocyte adhesion to human aortic endothelial cells.**
  Author(s): Koga T, Meydani M.
  Source: The American Journal of Clinical Nutrition. 2001 May; 73(5): 941-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11333849

- **Effect of quercetin and Albizzia saponins on rat mast cell.**
  Author(s): Johri RK, Zutshi U, Kameshwaran L, Atal CK.
  Source: Indian J Physiol Pharmacol. 1985 January-March; 29(1): 43-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3932203

- **Effect of quercetin on activities of protein kinase C and tyrosine protein kinase from HL-60 cells.**
  Author(s): Kang TB, Liang NC.
  Source: Zhongguo Yao Li Xue Bao. 1997 July; 18(4): 374-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10072927

- **Effect of quercetin on adhesion of platelets to microvascular endothelial cells in vitro.**
  Author(s): Fan PS, Gu ZL, Liang ZQ.
  Source: Acta Pharmacologica Sinica. 2001 September; 22(9): 857-60.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11749871

- **Effect of quercetin on human polymorphonuclear leukocyte lysosomal enzyme release and phospholipid metabolism.**
  Author(s): Lee TP, Matteliano ML, Middleton E Jr.
  Source: Life Sciences. 1982 December 13; 31(24): 2765-74.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6818414

- **Effect of quercetin on prostaglandin A1-induced heat shock response in human cells.**
  Author(s): Elia G, Santoro MG.
  Source: Annals of the New York Academy of Sciences. 1994 November 15; 744: 323-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7825859

- **Effect of semi-synthesized quercetin water-soluble derivatives on recombinant human phosphatidylinositol 3-kinase p110beta catalytic subunit.**
  Author(s): Liu W, Liang NC.
  Source: Acta Pharmacologica Sinica. 2002 April; 23(4): 339-42.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11931710

- **Effect of three flavonoids, 5,7,3',4'-tetrahydroxy-3-methoxy flavone, luteolin, and quercetin, on the stimulus-induced superoxide generation and tyrosyl phosphorylation of proteins in human neutrophil.**
  Author(s): Lu HW, Sugahara K, Sagara Y, Masuoka N, Asaka Y, Manabe M, Kodama H.
  Source: Archives of Biochemistry and Biophysics. 2001 September 1; 393(1): 73-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11516163

- **Effects of epigallocatechin gallate and quercetin on oxidative damage to cellular DNA.**
  Author(s): Johnson MK, Loo G.
  Source: Mutation Research. 2000 April 28; 459(3): 211-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10812333

- **Effects of luteolin and quercetin, inhibitors of tyrosine kinase, on cell growth and metastasis-associated properties in A431 cells overexpressing epidermal growth factor receptor.**
  Author(s): Huang YT, Hwang JJ, Lee PP, Ke FC, Huang JH, Huang CJ, Kandaswami C, Middleton E Jr, Lee MT.
  Source: British Journal of Pharmacology. 1999 November; 128(5): 999-1010.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10556937

- **Effects of luteolin, quercetin and baicalein on immunoglobulin E-mediated mediator release from human cultured mast cells.**
  Author(s): Kimata M, Shichijo M, Miura T, Serizawa I, Inagaki N, Nagai H.
  Source: Clinical and Experimental Allergy : Journal of the British Society for Allergy and Clinical Immunology. 2000 April; 30(4): 501-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10718847

- **Effects of phenol-depleted and phenol-rich diets on blood markers of oxidative stress, and urinary excretion of quercetin and kaempferol in healthy volunteers.**
  Author(s): Kim HY, Kim OH, Sung MK.
  Source: Journal of the American College of Nutrition. 2003 June; 22(3): 217-23.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12805248

- **Effects of quercetin and sunphenon on responses of cancer cells to heat shock damage.**
  Author(s): Kudo M, Naito Z, Yokoyama M, Asano G.
  Source: Experimental and Molecular Pathology. 1999 April; 66(1): 66-75.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10331966

- **Effects of quercetin on aggregation and intracellular free calcium of platelets.**
  Author(s): Xiao D, Gu ZL, Bai JP, Wang Z.
  Source: Zhongguo Yao Li Xue Bao. 1995 May; 16(3): 223-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7660815

- **Effects of quercetin on drug metabolizing enzymes and oxidation of 2',7-dichlorofluorescin in HepG2 cells.**
  Author(s): Musonda CA, Helsby N, Chipman JK.
  Source: Human & Experimental Toxicology. 1997 December; 16(12): 700-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9429083

- **Effects of quercetin on epithelial chloride secretion.**
  Author(s): Sanchez de Medina F, Galvez J, Gonzalez M, Zarzuelo A, Barrett KE.
  Source: Life Sciences. 1997; 61(20): 2049-55.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9366512

- **Effects of quercetin on magnesium-dependent adenosine triphosphatase and the metabolism of human polymorphonuclear leukocytes.**
  Author(s): Long GD, DeChatelet LR, O'Flaherty JT, McCall CE, Bass DA, Shirley PS, Parce JW.
  Source: Blood. 1981 March; 57(3): 561-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6450623

- **Effects of quercetin on production and release of endothelin and cGMP from cultured endothelial cells.**
  Author(s): Zhao XY, Gu ZL.
  Source: Zhongguo Yao Li Xue Bao. 1996 September; 17(5): 442-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9863170

- **Effects of quercetin on the heat-induced cytotoxicity of prostate cancer cells.**
  Author(s): Nakanoma T, Ueno M, Iida M, Hirata R, Deguchi N.
  Source: International Journal of Urology : Official Journal of the Japanese Urological Association. 2001 November; 8(11): 623-30.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11903689

- **Effects of quercetin on the release of endothelin, prostacyclin and tissue plasminogen activator from human endothelial cells in culture.**
  Author(s): Zhao X, Gu Z, Attele AS, Yuan CS.
  Source: Journal of Ethnopharmacology. 1999 November 30; 67(3): 279-85.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10617062

- **Effects of the flavonoid drug quercetin on the response of human prostate tumours to hyperthermia in vitro and in vivo.**
  Author(s): Asea A, Ara G, Teicher BA, Stevenson MA, Calderwood SK.
  Source: International Journal of Hyperthermia : the Official Journal of European Society for Hyperthermic Oncology, North American Hyperthermia Group. 2001 July-August; 17(4): 347-56.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11471985

- **Effects of the flavonoids quercetin and apigenin on hemostasis in healthy volunteers: results from an in vitro and a dietary supplement study.**
  Author(s): Janssen K, Mensink RP, Cox FJ, Harryvan JL, Hovenier R, Hollman PC, Katan MB.
  Source: The American Journal of Clinical Nutrition. 1998 February; 67(2): 255-62.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9459373

- **Efficiency of absorption and metabolic conversion of quercetin and its glucosides in human intestinal cell line Caco-2.**
  Author(s): Murota K, Shimizu S, Chujo H, Moon JH, Terao J.
  Source: Archives of Biochemistry and Biophysics. 2000 December 15; 384(2): 391-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11368329

- **Efflux of dietary flavonoid quercetin 4'-beta-glucoside across human intestinal Caco-2 cell monolayers by apical multidrug resistance-associated protein-2.**
  Author(s): Walgren RA, Karnaky KJ Jr, Lindenmayer GE, Walle T.
  Source: The Journal of Pharmacology and Experimental Therapeutics. 2000 September; 294(3): 830-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10945830

- **Electrospray ionisation mass spectrometric study of degradation products of quercetin, quercetin-3-glucoside and quercetin-3-rhamnoglucoside, produced by in vitro fermentation with human faecal flora.**
  Author(s): Justesen U, Arrigoni E.
  Source: Rapid Communications in Mass Spectrometry : Rcm. 2001; 15(7): 477-83.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11268131

- **Enhanced antioxidant activity after chlorination of quercetin by hypochlorous acid.**
  Author(s): Binsack R, Boersma BJ, Patel RP, Kirk M, White CR, Darley-Usmar V, Barnes S, Zhou F, Parks DA.
  Source: Alcoholism, Clinical and Experimental Research. 2001 March; 25(3): 434-43.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11290856

- **Enhanced anti-proliferative action of busulphan by quercetin on the human leukaemia cell line K562.**
  Author(s): Hoffman R, Graham L, Newlands ES.
  Source: British Journal of Cancer. 1989 March; 59(3): 347-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2930697

- **Enhanced elimination of Ph+ chromosome cells in vitro by combined hyperthermia and other drugs (AZT, IFN-alpha, TNF, and quercetin): its application to autologous bone marrow transplantation for CML.**
  Author(s): Osman Y, Moriyama Y, Shibata A.
  Source: Experimental Hematology. 1995 May; 23(5): 444-52. Erratum In: Exp Hematol 1995 November; 23(12): 1324.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7720816

- **Enhancement of the antiproliferative activity of cis-diamminedichloroplatinum(II) by quercetin.**
  Author(s): Hofmann J, Fiebig HH, Winterhalter BR, Berger DP, Grunicke H.
  Source: International Journal of Cancer. Journal International Du Cancer. 1990 March 15; 45(3): 536-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2155185

- **Enzymatic sulfation of quercetin by arylsulfotransferase from a human intestinal bacterium.**
  Author(s): Koizumi M, Shimizu M, Kobashi K.
  Source: Chemical & Pharmaceutical Bulletin. 1990 March; 38(3): 794-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2347024

- **Evidence of covalent binding of the dietary flavonoid quercetin to DNA and protein in human intestinal and hepatic cells.**
  Author(s): Walle T, Vincent TS, Walle UK.
  Source: Biochemical Pharmacology. 2003 May 15; 65(10): 1603-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12754096

- **Extensive binding of the bioflavonoid quercetin to human plasma proteins.**
  Author(s): Boulton DW, Walle UK, Walle T.
  Source: The Journal of Pharmacy and Pharmacology. 1998 February; 50(2): 243-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9530994

- **Fate of the flavonoid quercetin in human cell lines: chemical instability and metabolism.**
  Author(s): Boulton DW, Walle UK, Walle T.
  Source: The Journal of Pharmacy and Pharmacology. 1999 March; 51(3): 353-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10344638

- **Flavonoid quercetin sensitizes a CD95-resistant cell line to apoptosis by activating protein kinase Calpha.**
  Author(s): Russo M, Palumbo R, Mupo A, Tosto M, Iacomino G, Scognamiglio A, Tedesco I, Galano G, Russo GL.
  Source: Oncogene. 2003 May 22; 22(21): 3330-42.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12761503

- **Flavonoids as cycline-dependent kinase inhibitors: inhibition of cdc 25 phosphatase activity by flavonoids belonging to the quercetin and kaempferol series.**
  Author(s): Aligiannis N, Mitaku S, Mitrocotsa D, Leclerc S.
  Source: Planta Medica. 2001 July; 67(5): 468-70.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11488465

- **Genotoxicity of quercetin in the micronucleus assay in mouse bone marrow erythrocytes, human lymphocytes, V79 cell line and identification of kinetochore-containing (CREST staining) micronuclei in human lymphocytes.**
  Author(s): Caria H, Chaveca T, Laires A, Rueff J.
  Source: Mutation Research. 1995 June; 343(2-3): 85-94.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7791812

- **Growth-inhibitory effect of quercetin and presence of type II estrogen binding sites in primary human transitional cell carcinomas.**
  Author(s): Larocca LM, Giustacchini M, Maggiano N, Ranelletti FO, Piantelli M, Alcini E, Capelli A.
  Source: The Journal of Urology. 1994 September; 152(3): 1029-33.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8051728

- **Growth-inhibitory effect of quercetin and presence of type-II estrogen-binding sites in human colon-cancer cell lines and primary colorectal tumors.**
  Author(s): Ranelletti FO, Ricci R, Larocca LM, Maggiano N, Capelli A, Scambia G, Benedetti-Panici P, Mancuso S, Rumi C, Piantelli M.
  Source: International Journal of Cancer. Journal International Du Cancer. 1992 February 1; 50(3): 486-92.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1735617

- **Growth-inhibitory effect of tamoxifen and quercetin and presence of type II estrogen binding sites in human laryngeal cancer cell lines and primary laryngeal tumors.**
  Author(s): Ferrandina G, Almadori G, Maggiano N, Lanza P, Ferlini C, Cattani P, Piantelli M, Scambia G, Ranelletti FO.
  Source: International Journal of Cancer. Journal International Du Cancer. 1998 August 31; 77(5): 747-54.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9688309

- **Human metabolism of dietary flavonoids: identification of plasma metabolites of quercetin.**
  Author(s): Day AJ, Mellon F, Barron D, Sarrazin G, Morgan MR, Williamson G.
  Source: Free Radical Research. 2001 December; 35(6): 941-52.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11811545

- **Human metabolism of dietary quercetin glycosides.**
  Author(s): Day AJ, Williamson G.
  Source: Basic Life Sci. 1999; 66: 415-34. Review. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10800454

- **Human myeloperoxidase activity is inhibited in vitro by quercetin. Comparison with three related compounds.**
  Author(s): Pincemail J, Deby C, Thirion A, de Bruyn-Dister M, Goutier R.
  Source: Experientia. 1988 May 15; 44(5): 450-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2836234

- **Identification of quercetin glucuronides in human plasma by high-performance liquid chromatography-tandem mass spectrometry.**
  Author(s): Wittig J, Herderich M, Graefe EU, Veit M.
  Source: J Chromatogr B Biomed Sci Appl. 2001 April 5; 753(2): 237-43.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11334336

- **Impairment of human sperm motility and viability by quercetin is independent of lipid peroxidation.**
  Author(s): Khanduja KL, Verma A, Bhardwaj A.
  Source: Andrologia. 2001 September; 33(5): 277-81.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11683702

- **In vitro glucuronidation of kaempferol and quercetin by human UGT-1A9 microsomes.**
  Author(s): Oliveira EJ, Watson DG.
  Source: Febs Letters. 2000 April 7; 471(1): 1-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10760502

- **In vitro studies indicate that miquelianin (quercetin 3-O-beta-D-glucuronopyranoside) is able to reach the CNS from the small intestine.**
  Author(s): Juergenliemk G, Boje K, Huewel S, Lohmann C, Galla HJ, Nahrstedt A.
  Source: Planta Medica. 2003 November; 69(11): 1013-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14735439

- **In vitro studies on the selective cytotoxic effect of crocetin and quercetin.**
  Author(s): Jagadeeswaran R, Thirunavukkarasu C, Gunasekaran P, Ramamurty N, Sakthisekaran D.
  Source: Fitoterapia. 2000 August; 71(4): 395-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10925010

- **Induction of apoptosis by quercetin: involvement of heat shock protein.**
  Author(s): Wei YQ, Zhao X, Kariya Y, Fukata H, Teshigawara K, Uchida A.
  Source: Cancer Research. 1994 September 15; 54(18): 4952-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8069862

- **Induction of cell cycle arrest and apoptosis in human breast cancer cells by quercetin.**
  Author(s): Choi JA, Kim JY, Lee JY, Kang CM, Kwon HJ, Yoo YD, Kim TW, Lee YS, Lee SJ.
  Source: International Journal of Oncology. 2001 October; 19(4): 837-44.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11562764

- **Induction of human NAD(P)H:quinone oxidoreductase (NQO1) gene expression by the flavonol quercetin.**
  Author(s): Valerio LG Jr, Kepa JK, Pickwell GV, Quattrochi LC.
  Source: Toxicology Letters. 2001 February 3; 119(1): 49-57.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11275421

- **Induction of neutral endopeptidase and angiotensin-converting enzyme activity of SK-N-SH cells in vitro by quercetin and resveratrol.**
  Author(s): Melzig MF, Escher F.
  Source: Pharmazie. 2002 August; 57(8): 556-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12227197

- **Induction of UDP-glucuronosyltransferase by the flavonoids chrysin and quercetin in Caco-2 cells.**
  Author(s): Galijatovic A, Walle UK, Walle T.
  Source: Pharmaceutical Research. 2000 January; 17(1): 21-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10714603

- **Influence of ethyl acetate extract and quercetin-3-methyl ether from Polygonum amphibium on activation lymphocytes from peripheral blood of healthy donor in vitro.**
  Author(s): Smolarz HD, Surdacka A, Rolinski J.
  Source: Phytotherapy Research : Ptr. 2003 August; 17(7): 744-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12916071

- **Influence of the dietary flavonoid quercetin on the cardioprotective antioxidant action of oestrogen and phytoestrogens.**
  Author(s): Wiseman H, O'Reilly J.
  Source: Biochemical Society Transactions. 1997 February; 25(1): 108S.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9057006

- **Inhibition by quercetin of activation of polymorphonuclear leucocyte functions. Stimulus-specific effects.**
  Author(s): Berton G, Schneider C, Romeo D.
  Source: Biochimica Et Biophysica Acta. 1980; 595(1): 47-55.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7349882

- **Inhibition by quercetin of thyroid hormone stimulation in vitro of human red blood cell Ca2+-ATPase activity.**
  Author(s): Davis FB, Middleton E Jr, Davis PJ, Blas SD.
  Source: Cell Calcium. 1983 April; 4(2): 71-81.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6223702

- **Inhibition of aggregation and secretion of human platelets by quercetin and other flavonoids: structure-activity relationships.**
  Author(s): Beretz A, Cazenave JP, Anton R.
  Source: Agents Actions. 1982 July; 12(3): 382-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6182778

- **Inhibition of estrone sulfatase in human liver microsomes by quercetin and other flavonoids.**
  Author(s): Huang Z, Fasco MJ, Kaminsky LS.
  Source: The Journal of Steroid Biochemistry and Molecular Biology. 1997 September-October; 63(1-3): 9-15.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9449200

- **Inhibition of heat-induced phosphorylation of stathmin by the bioflavonoid quercetin.**
  Author(s): Nagasaka Y, Fijimoto M, Arai H, Nakamura K.
  Source: Electrophoresis. 2002 February; 23(4): 670-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11870780

- **Inhibition of human glutathione S-transferase P1-1 by the flavonoid quercetin.**
  Author(s): van Zanden JJ, Ben Hamman O, van Iersel ML, Boeren S, Cnubben NH, Lo Bello M, Vervoort J, van Bladeren PJ, Rietjens IM.
  Source: Chemico-Biological Interactions. 2003 May 6; 145(2): 139-48.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12686490

- **Inhibition of mammalian 15-lipoxygenase-dependent lipid peroxidation in low-density lipoprotein by quercetin and quercetin monoglucosides.**
  Author(s): Luiz da Silva E, Tsushida T, Terao J.
  Source: Archives of Biochemistry and Biophysics. 1998 January 15; 349(2): 313-20.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9448720

- **Inhibition of phenol sulfotransferase (SULT1A1) by quercetin in human adult and foetal livers.**
  Author(s): De Santi C, Pietrabissa A, Mosca F, Rane A, Pacifici GM.
  Source: Xenobiotica; the Fate of Foreign Compounds in Biological Systems. 2002 May; 32(5): 363-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12065059

- **Inhibition of photooxidation of alpha-tocopherol by quercetin in human blood cell membranes in the presence of hematoporphyrin as a photosensitizer.**
  Author(s): Jan CY, Takahama U, Kimura M.
  Source: Biochimica Et Biophysica Acta. 1991 October 15; 1086(1): 7-14.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1954246

- **Inhibition of phthalocyanine-sensitized photohemolysis of human erythrocytes by quercetin.**
  Author(s): Ben-Hur E, Rosenthal I, Granot Y.
  Source: Photochemistry and Photobiology. 1993 June; 57(6): 984-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8367538

- **Inhibition of thromboxane formation as the antiplatelet mechanism of 3,4-dihydroxyxanthone and quercetin pentaacetate.**
  Author(s): Lin HC, Liu HW, Lin CN, Teng CM.
  Source: Gaoxiong Yi Xue Ke Xue Za Zhi. 1991 October; 7(10): 505-12.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1811069

- **Inhibition of Vpr-induced cell cycle abnormality by quercetin: a novel strategy for searching compounds targeting Vpr.**
  Author(s): Shimura M, Zhou Y, Asada Y, Yoshikawa T, Hatake K, Takaku F, Ishizaka Y.
  Source: Biochemical and Biophysical Research Communications. 1999 August 2; 261(2): 308-16.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10425183

- **Inhibitory effect of quercetin metabolites and their related derivatives on copper ion-induced lipid peroxidation in human low-density lipoprotein.**
  Author(s): Yamamoto N, Moon JH, Tsushida T, Nagao A, Terao J.
  Source: Archives of Biochemistry and Biophysics. 1999 December 15; 372(2): 347-54.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10600174

- **Inhibitory effect of quercetin on OVCA 433 cells and presence of type II oestrogen binding sites in primary ovarian tumours and cultured cells.**
  Author(s): Scambia G, Ranelletti FO, Panici PB, Piantelli M, Bonanno G, De Vincenzo R, Ferrandina G, Rumi C, Larocca LM, Mancuso S.
  Source: British Journal of Cancer. 1990 December; 62(6): 942-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2257224

- **Inhibitory effect of quercetin on primary ovarian and endometrial cancers and synergistic activity with cis-diamminedichloroplatinum (II).**
  Author(s): Scambia G, Ranelletti FO, Benedetti Panici P, Piantelli M, Bonanno G, De Vincenzo R, Ferrandina G, Maggiano N, Capelli A, Mancuso S.
  Source: Gynecologic Oncology. 1992 April; 45(1): 13-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1601330

- **Inhibitory effect of quercetin on the synthesis of a possibly cell-cycle-related 17-kDa protein, in human colon cancer cells.**
  Author(s): Hosokawa N, Hosokawa Y, Sakai T, Yoshida M, Marui N, Nishino H, Kawai K, Aoike A.
  Source: International Journal of Cancer. Journal International Du Cancer. 1990 June 15; 45(6): 1119-24.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2351487

- **Interaction between quercetin and Ca2+-calmodulin complex: possible mechanism for anti-tumor-promoting action of the flavonoid.**
  Author(s): Nishino H, Naito E, Iwashima A, Tanaka K, Matsuura T, Fujiki H, Sugimura T.
  Source: Gann. 1984 April; 75(4): 311-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6735033

- **Interaction with type II estrogen binding sites and antiproliferative activity of tamoxifen and quercetin in human non-small-cell lung cancer.**
  Author(s): Caltagirone S, Ranelletti FO, Rinelli A, Maggiano N, Colasante A, Musiani P, Aiello FB, Piantelli M.
  Source: American Journal of Respiratory Cell and Molecular Biology. 1997 July; 17(1): 51-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9224209

- **Intestinal apolipoprotein B secretion is inhibited by the flavonoid quercetin: potential role of microsomal triglyceride transfer protein and diacylglycerol acyltransferase.**
  Author(s): Casaschi A, Wang Q, Dang K, Richards A, Theriault A.
  Source: Lipids. 2002 July; 37(7): 647-52.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12216835

- **Intracellular metabolism and bioactivity of quercetin and its in vivo metabolites.**
  Author(s): Spencer JP, Kuhnle GG, Williams RJ, Rice-Evans C.
  Source: The Biochemical Journal. 2003 May 15; 372(Pt 1): 173-81.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12578560

- **Involvement of rat cytochrome 1A1 in the biotransformation of kaempferol to quercetin: relevance to the genotoxicity of kaempferol.**
  Author(s): Silva ID, Rodrigues AS, Gaspar J, Maia R, Laires A, Rueff J.
  Source: Mutagenesis. 1997 September; 12(5): 383-90.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9379919

- **Isolation and structural elucidation of 3,4',5,7-tetraacetyl quercetin from Adina cordifolia (Karam ki Gaach).**
  Author(s): Rao MS, Duddeck H, Dembinski R.
  Source: Fitoterapia. 2002 July; 73(4): 353-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12234584

- **Lack of effect of the flavonoids, myricetin, quercetin, and rutin, on repair of H2O2-induced DNA single-strand breaks in Caco-2, Hep G2, and V79 cells.**
  Author(s): Aherne SA, O'Brien NM.
  Source: Nutrition and Cancer. 2000; 38(1): 106-15.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11341035

- **Linkage of reduction in 1-phosphatidylinositol 4-kinase activity and inositol 1,4,5-trisphosphate concentration in human ovarian carcinoma cells treated with quercetin.**
  Author(s): Prajda N, Singhal RL, Yeh YA, Olah E, Look KY, Weber G.
  Source: Life Sciences. 1995; 56(19): 1587-93.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7723587

- **Low concentrations of quercetin and ellagic acid synergistically influence proliferation, cytotoxicity and apoptosis in MOLT-4 human leukemia cells.**
  Author(s): Mertens-Talcott SU, Talcott ST, Percival SS.
  Source: The Journal of Nutrition. 2003 August; 133(8): 2669-74.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12888656

- **Measurement of trans-resveratrol, (+)-catechin, and quercetin in rat and human blood and urine by gas chromatography with mass selective detection.**
  Author(s): Soleas GJ, Yan J, Goldberg DM.
  Source: Methods Enzymol. 2001; 335: 130-45. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11400362

- **Mechanism of oxidative DNA damage induced by quercetin in the presence of Cu(II).**
  Author(s): Yamashita N, Tanemura H, Kawanishi S.
  Source: Mutation Research. 1999 March 10; 425(1): 107-15.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10082921

- **Mechanism of protection by the flavonoids, quercetin and rutin, against tert-butylhydroperoxide- and menadione-induced DNA single strand breaks in Caco-2 cells.**
  Author(s): Aherne SA, O'Brien NM.
  Source: Free Radical Biology & Medicine. 2000 September 15; 29(6): 507-14.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11025194

- **Mechanism of quercetin-induced suppression and delay of heat shock gene expression and thermotolerance development in HT-29 cells.**
  Author(s): Lee YJ, Erdos G, Hou ZZ, Kim SH, Kim JH, Cho JM, Corry PM.
  Source: Molecular and Cellular Biochemistry. 1994 August 31; 137(2): 141-54.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7845388

- **Metabolism of quercetin and kaempferol by rat hepatocytes and the identification of flavonoid glycosides in human plasma.**
  Author(s): Oliveira EJ, Watson DG, Grant MH.
  Source: Xenobiotica; the Fate of Foreign Compounds in Biological Systems. 2002 April; 32(4): 279-87.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12028662

- **Metabolism of quercetin-7- and quercetin-3-glucuronides by an in vitro hepatic model: the role of human beta-glucuronidase, sulfotransferase, catechol-O-methyltransferase and multi-resistant protein 2 (MRP2) in flavonoid metabolism.**
  Author(s): O'Leary KA, Day AJ, Needs PW, Mellon FA, O'Brien NM, Williamson G.
  Source: Biochemical Pharmacology. 2003 February 1; 65(3): 479-91.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12527341

- **Methylation of quercetin and fisetin, flavonoids widely distributed in edible vegetables, fruits and wine, by human liver.**
  Author(s): De Santi C, Pietrabissa A, Mosca F, Pacifici GM.
  Source: Int J Clin Pharmacol Ther. 2002 May; 40(5): 207-12.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12051572

- **Modulating effect of resveratrol and quercetin on oral cancer cell growth and proliferation.**
  Author(s): ElAttar TM, Virji AS.
  Source: Anti-Cancer Drugs. 1999 February; 10(2): 187-93.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10211549

- **Modulation of prostaglandin A1-induced thermotolerance by quercetin in human leukemic cells: role of heat shock protein 70.**
  Author(s): Elia G, Amici C, Rossi A, Santoro MG.
  Source: Cancer Research. 1996 January 1; 56(1): 210-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8548766

- **Molecular mechanisms in the antiproliferative action of quercetin.**
  Author(s): Csokay B, Prajda N, Weber G, Olah E.
  Source: Life Sciences. 1997; 60(24): 2157-63.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9188758

- **Mutagenic activity in the wine-making process: correlations with rutin and quercetin levels.**
  Author(s): Rueff J, Laires A, Gaspar J, Rodrigues A.
  Source: Mutagenesis. 1990 July; 5(4): 393-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2398821

- **Nonalcoholic red wine extract and quercetin inhibit LDL oxidation without affecting plasma antioxidant vitamin and carotenoid concentrations.**
  Author(s): Chopra M, Fitzsimons PE, Strain JJ, Thurnham DI, Howard AN.
  Source: Clinical Chemistry. 2000 August; 46(8 Pt 1): 1162-70.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10926898

- **Oral absorption and metabolism of quercetin and sugar-conjugated derivatives in specific transport systems.**
  Author(s): Noteborn HP, Jansen E, Benito S, Mengelers MJ.
  Source: Cancer Letters. 1997 March 19; 114(1-2): 175-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9103284

- **Oxidation of quercetin by salivary components. Quercetin-dependent reduction of salivary nitrite under acidic conditions producing nitric oxide.**
  Author(s): Takahama U, Oniki T, Hirota S.
  Source: Journal of Agricultural and Food Chemistry. 2002 July 17; 50(15): 4317-22.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12105964

- **Pharmacokinetics and bioavailability of quercetin glycosides in humans.**
  Author(s): Graefe EU, Wittig J, Mueller S, Riethling AK, Uehleke B, Drewelow B, Pforte H, Jacobasch G, Derendorf H, Veit M.
  Source: Journal of Clinical Pharmacology. 2001 May; 41(5): 492-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11361045

- **Pharmacokinetics and bioavailability of the flavonol quercetin in humans.**
  Author(s): Graefe EU, Derendorf H, Veit M.
  Source: Int J Clin Pharmacol Ther. 1999 May; 37(5): 219-33. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10363620

- **Pharmacokinetics of quercetin from quercetin aglycone and rutin in healthy volunteers.**
  Author(s): Erlund I, Kosonen T, Alfthan G, Maenpaa J, Perttunen K, Kenraali J, Parantainen J, Aro A.
  Source: European Journal of Clinical Pharmacology. 2000 November; 56(8): 545-53.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11151743

- **Phase I clinical trial of the flavonoid quercetin: pharmacokinetics and evidence for in vivo tyrosine kinase inhibition.**
  Author(s): Ferry DR, Smith A, Malkhandi J, Fyfe DW, deTakats PG, Anderson D, Baker J, Kerr DJ.
  Source: Clinical Cancer Research : an Official Journal of the American Association for Cancer Research. 1996 April; 2(4): 659-68.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9816216

- **Plasma concentrations and urinary excretion of the antioxidant flavonols quercetin and kaempferol as biomarkers for dietary intake.**
  Author(s): de Vries JH, Hollman PC, Meyboom S, Buysman MN, Zock PL, van Staveren WA, Katan MB.
  Source: The American Journal of Clinical Nutrition. 1998 July; 68(1): 60-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9665097

- **Plasma concentrations of the flavonoids hesperetin, naringenin and quercetin in human subjects following their habitual diets, and diets high or low in fruit and vegetables.**
  Author(s): Erlund I, Silaste ML, Alfthan G, Rantala M, Kesaniemi YA, Aro A.
  Source: European Journal of Clinical Nutrition. 2002 September; 56(9): 891-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12209378

- **Potential health effects of the dietary flavonol quercetin.**
  Author(s): Hertog MG, Hollman PC.
  Source: European Journal of Clinical Nutrition. 1996 February; 50(2): 63-71. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8641249

- **Pre-clinical and clinical study of QC12, a water-soluble, pro-drug of quercetin.**
  Author(s): Mulholland PJ, Ferry DR, Anderson D, Hussain SA, Young AM, Cook JE, Hodgkin E, Seymour LW, Kerr DJ.
  Source: Annals of Oncology : Official Journal of the European Society for Medical Oncology / Esmo. 2001 February; 12(2): 245-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11300332

- **Probing the binding of the flavonoid, quercetin to human serum albumin by circular dichroism, electronic absorption spectroscopy and molecular modelling methods.**
  Author(s): Zsila F, Bikadi Z, Simonyi M.
  Source: Biochemical Pharmacology. 2003 February 1; 65(3): 447-56.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12527338

- **Protection against oxidative damage of erythrocyte membrane by the flavonoid quercetin and its relation to iron chelating activity.**
  Author(s): Ferrali M, Signorini C, Caciotti B, Sugherini L, Ciccoli L, Giachetti D, Comporti M.
  Source: Febs Letters. 1997 October 20; 416(2): 123-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9369196

- **Protection by quercetin against cooking oil fumes-induced DNA damage in human lung adenocarcinoma CL-3 cells: role of COX-2.**
  Author(s): Lin SY, Tsai SJ, Wang LH, Wu MF, Lee H.
  Source: Nutrition and Cancer. 2002; 44(1): 95-101.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12672646

- **Protection by quercetin and quercetin 3-O-beta-D-glucuronide of peroxynitrite-induced antioxidant consumption in human plasma low-density lipoprotein.**
  Author(s): Terao J, Yamaguchi S, Shirai M, Miyoshi M, Moon JH, Oshima S, Inakuma T, Tsushida T, Kato Y.
  Source: Free Radical Research. 2001 December; 35(6): 925-31.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11811543

- **Protection by the flavonoids myricetin, quercetin, and rutin against hydrogen peroxide-induced DNA damage in Caco-2 and Hep G2 cells.**
  Author(s): Aherne SA, O'Brien NM.
  Source: Nutrition and Cancer. 1999; 34(2): 160-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10578483

- **Protective effect of quercetin and rutin on photosensitized lysis of human erythrocytes in the presence of hematoporphyrin.**
  Author(s): Sorata Y, Takahama U, Kimura M.
  Source: Biochimica Et Biophysica Acta. 1984 June 29; 799(3): 313-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6733152

- **Quercetin 3-arabinopyranoside, a major flavonoid compound from Alchemilla xanthochlora.**
  Author(s): Fraisse D, Heitz A, Carnat A, Carnat AP, Lamaison JL.
  Source: Fitoterapia. 2000 August; 71(4): 463-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10925029

- **Quercetin 3-O-(6”-caffeoyl)-beta-D-galactopyranoside from Polygonum viscosum.**
  Author(s): Datta BK, Datta SK, Sarker SD.
  Source: Fitoterapia. 2000 August; 71(4): 459-60.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10925027

- **Quercetin abrogates taxol-mediated signaling by inhibiting multiple kinases.**
  Author(s): Marone M, D'Andrilli G, Das N, Ferlini C, Chatterjee S, Scambia G.
  Source: Experimental Cell Research. 2001 October 15; 270(1): 1-12.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11597122

- **Quercetin and anti-CD95(Fas/Apo1) enhance apoptosis in HPB-ALL cell line.**
  Author(s): Russo M, Palumbo R, Tedesco I, Mazzarella G, Russo P, Iacomino G, Russo GL.
  Source: Febs Letters. 1999 December 3; 462(3): 322-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10622719

- **Quercetin and myricetin protect against hydrogen peroxide-induced DNA damage (strand breaks and oxidised pyrimidines) in human lymphocytes.**
  Author(s): Duthie SJ, Collins AR, Duthie GG, Dobson VL.
  Source: Mutation Research. 1997 October 24; 393(3): 223-31.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9393615

- **Quercetin and resveratrol potently reduce estrogen sulfotransferase activity in normal human mammary epithelial cells.**
  Author(s): Otake Y, Nolan AL, Walle UK, Walle T.
  Source: The Journal of Steroid Biochemistry and Molecular Biology. 2000 July-August; 73(5): 265-70.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11070355

- **Quercetin and tamoxifen sensitize human melanoma cells to hyperthermia.**
  Author(s): Piantelli M, Tatone D, Castrilli G, Savini F, Maggiano N, Larocca LM, Ranelletti FO, Natali PG.
  Source: Melanoma Research. 2001 October; 11(5): 469-76.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11595883

- **Quercetin and the growth of leukemic progenitors.**
  Author(s): Larocca LM, Teofili L, Maggiano N, Piantelli M, Ranelletti FO, Leone G.
  Source: Leukemia & Lymphoma. 1996 September; 23(1-2): 49-53. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9021685

- **Quercetin arrests human leukemic T-cells in late G1 phase of the cell cycle.**
  Author(s): Yoshida M, Yamamoto M, Nikaido T.
  Source: Cancer Research. 1992 December 1; 52(23): 6676-81.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1423313

- **Quercetin as a modulator of the cellular neoplastic phenotype. Effects on the expression of mutated H-ras and p53 in rodent and human cells.**
  Author(s): Avila MA, Cansado J, Harter KW, Velasco JA, Notario V.
  Source: Advances in Experimental Medicine and Biology. 1996; 401: 101-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8886129

- **Quercetin cumulatively enhances copper induction of metallothionein in intestinal cells.**
  Author(s): Kuo SM, Huang CT, Blum P, Chang C.
  Source: Biological Trace Element Research. 2001 Winter; 84(1-3): 1-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11817679

- **Quercetin derivatives are deconjugated and converted to hydroxyphenylacetic acids but not methylated by human fecal flora in vitro.**
  Author(s): Aura AM, O'Leary KA, Williamson G, Ojala M, Bailey M, Puupponen-Pimia R, Nuutila AM, Oksman-Caldentey KM, Poutanen K.
  Source: Journal of Agricultural and Food Chemistry. 2002 March 13; 50(6): 1725-30.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11879065

- **Quercetin down-regulated bcl-2 gene expression in human leukemia HL-60 cells.**
  Author(s): Xiao D, Gu ZL, Zhu SP.
  Source: Zhongguo Yao Li Xue Bao. 1998 November; 19(6): 551-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10437144

- **Quercetin down-regulates signal transduction in human breast carcinoma cells.**
  Author(s): Singhal RL, Yeh YA, Praja N, Olah E, Sledge GW Jr, Weber G.
  Source: Biochemical and Biophysical Research Communications. 1995 March 8; 208(1): 425-31.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7887960

- **Quercetin elevates p27(Kip1) and arrests both primary and HPV16 E6/E7 transformed human keratinocytes in G1.**
  Author(s): Beniston RG, Campo MS.
  Source: Oncogene. 2003 August 21; 22(35): 5504-14.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12934110

- **Quercetin enhances transforming growth factor beta 1 secretion by human ovarian cancer cells.**
  Author(s): Scambia G, Panici PB, Ranelletti FO, Ferrandina G, De Vincenzo R, Piantelli M, Masciullo V, Bonanno G, Isola G, Mancuso S.
  Source: International Journal of Cancer. Journal International Du Cancer. 1994 April 15; 57(2): 211-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8157359

- **Quercetin exerts a preferential cytotoxic effect on active dividing colon carcinoma HT29 and Caco-2 cells.**
  Author(s): Agullo G, Gamet L, Besson C, Demigne C, Remesy C.
  Source: Cancer Letters. 1994 November 25; 87(1): 55-63.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7954370

- **Quercetin exerts multiple inhibitory effects on vascular smooth muscle cells: role of ERK1/2, cell-cycle regulation, and matrix metalloproteinase-9.**
  Author(s): Moon SK, Cho GO, Jung SY, Gal SW, Kwon TK, Lee YC, Madamanchi NR, Kim CH.
  Source: Biochemical and Biophysical Research Communications. 2003 February 21; 301(4): 1069-78.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12589822

- **Quercetin glucosides are completely hydrolyzed in ileostomy patients before absorption.**
  Author(s): Walle T, Otake Y, Walle UK, Wilson FA.
  Source: The Journal of Nutrition. 2000 November; 130(11): 2658-61.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11053503

- **Quercetin glucuronide prevents VSMC hypertrophy by angiotensin II via the inhibition of JNK and AP-1 signaling pathway.**
  Author(s): Yoshizumi M, Tsuchiya K, Suzaki Y, Kirima K, Kyaw M, Moon JH, Terao J, Tamaki T.
  Source: Biochemical and Biophysical Research Communications. 2002 May 24; 293(5): 1458-65.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12054679

- **Quercetin glucuronides inhibited 2-aminofluorene acetylation in human acute myeloid HL-60 leukemia cells.**
  Author(s): Kuo HM, Ho HJ, Chao PD, Chung JG.
  Source: Phytomedicine : International Journal of Phytotherapy and Phytopharmacology. 2002 October; 9(7): 625-31.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12487326

- **Quercetin in men with category III chronic prostatitis: a preliminary prospective, double-blind, placebo-controlled trial.**
  Author(s): Shoskes DA, Zeitlin SI, Shahed A, Rajfer J.
  Source: Urology. 1999 December; 54(6): 960-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10604689

- **Quercetin in our diet: from potent mutagen to probable anticarcinogen.**
  Author(s): Stavric B.
  Source: Clinical Biochemistry. 1994 August; 27(4): 245-8. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8001284

- **Quercetin induced apoptosis in human leukemia HL-60 cells.**
  Author(s): Xiao D, Zhu SP, Gu ZL.
  Source: Zhongguo Yao Li Xue Bao. 1997 May; 18(3): 280-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10072952

- **Quercetin induces type-II estrogen-binding sites in estrogen-receptor-negative (MDA-MB231) and estrogen-receptor-positive (MCF-7) human breast-cancer cell lines.**
  Author(s): Scambia G, Ranelletti FO, Panici PB, Piantelli M, De Vincenzo R, Ferrandina G, Bonanno G, Capelli A, Mancuso S.
  Source: International Journal of Cancer. Journal International Du Cancer. 1993 May 28; 54(3): 462-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8509221

- **Quercetin inhibits Ca2+ uptake but not Ca2+ release by sarcoplasmic reticulum in skinned muscle fibers.**
  Author(s): Shoshan V, Campbell KP, MacLennan DH, Frodis W, Britt BA.
  Source: Proceedings of the National Academy of Sciences of the United States of America. 1980 August; 77(8): 4435-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6449007

- **Quercetin inhibits collagen-stimulated platelet activation through inhibition of multiple components of the glycoprotein VI signaling pathway.**
  Author(s): Hubbard GP, Stevens JM, Cicmil M, Sage T, Jordan PA, Williams CM, Lovegrove JA, Gibbins JM.
  Source: Journal of Thrombosis and Haemostasis : Jth. 2003 May; 1(5): 1079-88.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12871380

- **Quercetin inhibits heat shock protein induction but not heat shock factor DNA-binding in human breast carcinoma cells.**
  Author(s): Hansen RK, Oesterreich S, Lemieux P, Sarge KD, Fuqua SA.
  Source: Biochemical and Biophysical Research Communications. 1997 October 29; 239(3): 851-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9367858

- **Quercetin inhibits hexose transport in a human diploid fibroblast.**
  Author(s): Salter DW, Custead-Jones S, Cook JS.
  Source: The Journal of Membrane Biology. 1978 April 20; 40(1): 67-76.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=650675

- **Quercetin inhibits human vascular smooth muscle cell proliferation and migration.**
  Author(s): Alcocer F, Whitley D, Salazar-Gonzalez JF, Jordan WD, Sellers MT, Eckhoff DE, Suzuki K, Macrae C, Bland KI.
  Source: Surgery. 2002 February; 131(2): 198-204.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11854699

- **Quercetin inhibits hydrogen peroxide (H2O2)-induced NF-kappaB DNA binding activity and DNA damage in HepG2 cells.**
  Author(s): Musonda CA, Chipman JK.
  Source: Carcinogenesis. 1998 September; 19(9): 1583-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9771928

- **Quercetin inhibits inducible ICAM-1 expression in human endothelial cells through the JNK pathway.**
  Author(s): Kobuchi H, Roy S, Sen CK, Nguyen HG, Packer L.
  Source: The American Journal of Physiology. 1999 September; 277(3 Pt 1): C403-11.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10484327

- **Quercetin inhibits lipopolysaccharide-induced expression of endothelial cell intracellular adhesion molecule-1.**
  Author(s): Middleton E Jr, Anne S.
  Source: International Archives of Allergy and Immunology. 1995 May-June; 107(1-3): 435-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7613204

- **Quercetin inhibits matrix metalloproteinase-1 expression in human vascular endothelial cells through extracellular signal-regulated kinase.**
  Author(s): Song L, Xu M, Lopes-Virella MF, Huang Y.
  Source: Archives of Biochemistry and Biophysics. 2001 July 1; 391(1): 72-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11414687

- **Quercetin inhibits p21-RAS expression in human colon cancer cell lines and in primary colorectal tumors.**
  Author(s): Ranelletti FO, Maggiano N, Serra FG, Ricci R, Larocca LM, Lanza P, Scambia G, Fattorossi A, Capelli A, Piantelli M.
  Source: International Journal of Cancer. Journal International Du Cancer. 2000 February 1; 85(3): 438-45.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10652438

- **Quercetin inhibits Shc- and phosphatidylinositol 3-kinase-mediated c-Jun N-terminal kinase activation by angiotensin II in cultured rat aortic smooth muscle cells.**
  Author(s): Yoshizumi M, Tsuchiya K, Kirima K, Kyaw M, Suzaki Y, Tamaki T.
  Source: Molecular Pharmacology. 2001 October; 60(4): 656-65.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11562426

- **Quercetin inhibits the action of 12-O-tetradecanoylphorbol-13-acetate, a tumor promoter.**
  Author(s): Nishino H, Nishino A, Iwashima A, Tanaka K, Matsuura T.
  Source: Oncology. 1984; 41(2): 120-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6200810

- **Quercetin inhibits the expression and function of the androgen receptor in LNCaP prostate cancer cells.**
  Author(s): Xing N, Chen Y, Mitchell SH, Young CY.
  Source: Carcinogenesis. 2001 March; 22(3): 409-14.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11238180

- **Quercetin inhibits the growth of a multidrug-resistant estrogen-receptor-negative MCF-7 human breast-cancer cell line expressing type II estrogen-binding sites.**
  Author(s): Scambia G, Ranelletti FO, Benedetti Panici P, Piantelli M, Bonanno G, De Vincenzo R, Ferrandina G, Pierelli L, Capelli A, Mancuso S.
  Source: Cancer Chemotherapy and Pharmacology. 1991; 28(4): 255-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1879042

- **Quercetin inhibits the growth of leukemic progenitors and induces the expression of transforming growth factor-beta 1 in these cells.**
  Author(s): Larocca LM, Teofili L, Sica S, Piantelli M, Maggiano N, Leone G, Ranelletti FO.
  Source: Blood. 1995 June 15; 85(12): 3654-61.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7780149

- **Quercetin inhibits the sulfation of r(-)-apomorphine in human brain.**
  Author(s): Vietri M, Vaglini F, Cantini R, Pacifici GM.
  Source: Int J Clin Pharmacol Ther. 2003 January; 41(1): 30-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12564743

- **Quercetin intake and the incidence of cerebrovascular disease.**
  Author(s): Knekt P, Isotupa S, Rissanen H, Heliovaara M, Jarvinen R, Hakkinen S, Aromaa A, Reunanen A.
  Source: European Journal of Clinical Nutrition. 2000 May; 54(5): 415-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10822289

- **Quercetin is recovered in human plasma as conjugated derivatives which retain antioxidant properties.**
  Author(s): Manach C, Morand C, Crespy V, Demigne C, Texier O, Regerat F, Remesy C.
  Source: Febs Letters. 1998 April 24; 426(3): 331-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9600261

- **Quercetin mediates the down-regulation of mutant p53 in the human breast cancer cell line MDA-MB468.**
  Author(s): Avila MA, Velasco JA, Cansado J, Notario V.
  Source: Cancer Research. 1994 May 1; 54(9): 2424-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8162591

- **Quercetin modifies reactive oxygen levels but exerts only partial protection against oxidative stress within HL-60 cells.**
  Author(s): Bestwick CS, Milne L.
  Source: Biochimica Et Biophysica Acta. 2001 September 3; 1528(1): 49-59.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11514098

- **Quercetin not only inhibits P-glycoprotein efflux activity but also inhibits CYP3A isozymes.**
  Author(s): Sarkar MA.
  Source: Cancer Chemotherapy and Pharmacology. 1995; 36(5): 448-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7634387

- **Quercetin potentiates the effect of adriamycin in a multidrug-resistant MCF-7 human breast-cancer cell line: P-glycoprotein as a possible target.**
  Author(s): Scambia G, Ranelletti FO, Panici PB, De Vincenzo R, Bonanno G, Ferrandina G, Piantelli M, Bussa S, Rumi C, Cianfriglia M, et al.
  Source: Cancer Chemotherapy and Pharmacology. 1994; 34(6): 459-64.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7923555

- **Quercetin potentiates TNF-induced antiviral activity.**
  Author(s): Ohnishi E, Bannai H.
  Source: Antiviral Research. 1993 December; 22(4): 327-31.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8279819

- **Quercetin prevents DNA single strand breakage and cytotoxicity caused by tert-butylhydroperoxide: free radical scavenging versus iron chelating mechanism.**
  Author(s): Sestili P, Guidarelli A, Dacha M, Cantoni O.
  Source: Free Radical Biology & Medicine. 1998 July 15; 25(2): 196-200.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9667496

- **Quercetin prevents the cytotoxicity of oxidized LDL on lymphoid cell lines.**
  Author(s): Negre-Salvayre A, Salvayre R.
  Source: Free Radical Biology & Medicine. 1992; 12(2): 101-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1559614

- **Quercetin protects cutaneous tissue-associated cell types including sensory neurons from oxidative stress induced by glutathione depletion: cooperative effects of ascorbic acid.**
  Author(s): Skaper SD, Fabris M, Ferrari V, Dalle Carbonare M, Leon A.
  Source: Free Radical Biology & Medicine. 1997; 22(4): 669-78.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9013129

- **Quercetin regulates growth of Ishikawa cells through the suppression of EGF and cyclin D1.**
  Author(s): Kaneuchi M, Sasaki M, Tanaka Y, Sakuragi N, Fujimoto S, Dahiya R.
  Source: International Journal of Oncology. 2003 January; 22(1): 159-64.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12469199

- **Quercetin suppresses heat shock response by down regulation of HSF1.**
  Author(s): Nagai N, Nakai A, Nagata K.
  Source: Biochemical and Biophysical Research Communications. 1995 March 28; 208(3): 1099-105.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7702609

- **Quercetin triglycoside from Capparis spinosa.**
  Author(s): Sharaf M, el-Ansari MA, Saleh NA.
  Source: Fitoterapia. 2000 February; 71(1): 46-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11449469

- **Quercetin, a bioflavonoid, inhibits the DNA synthesis of human leukemia cells.**
  Author(s): Uddin S, Choudhry MA.
  Source: Biochem Mol Biol Int. 1995 July; 36(3): 545-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7549953

- **Quercetin, a bioflavonoid, inhibits the induction of interleukin 8 and monocyte chemoattractant protein-1 expression by tumor necrosis factor-alpha in cultured human synovial cells.**
  Author(s): Sato M, Miyazaki T, Kambe F, Maeda K, Seo H.
  Source: The Journal of Rheumatology. 1997 September; 24(9): 1680-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9292787

- **Quercetin, a dietary-derived flavonoid, possesses antiangiogenic potential.**
  Author(s): Tan WF, Lin LP, Li MH, Zhang YX, Tong YG, Xiao D, Ding J.
  Source: European Journal of Pharmacology. 2003 January 17; 459(2-3): 255-62.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12524154

- **Quercetin, a potent and specific inhibitor of the human P-form phenosulfotransferase.**
  Author(s): Walle T, Eaton EA, Walle UK.
  Source: Biochemical Pharmacology. 1995 August 25; 50(5): 731-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7669078

- **Quercetin, a regulator of polymorphonuclear leukocyte (PMNL) functions.**
  Author(s): Schneider C, Berton G, Spisani S, Traniello S, Romeo D.
  Source: Advances in Experimental Medicine and Biology. 1979; 121(A): 371-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=547731

- **Quercetin, an in vitro inhibitor of CYP3A, does not contribute to the interaction between nifedipine and grapefruit juice.**
  Author(s): Rashid J, McKinstry C, Renwick AG, Dirnhuber M, Waller DG, George CF.
  Source: British Journal of Clinical Pharmacology. 1993 November; 36(5): 460-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12959295

- **Quercetin, an inhibitor of heat shock protein synthesis, inhibits the acquisition of thermotolerance in a human colon carcinoma cell line.**
  Author(s): Koishi M, Hosokawa N, Sato M, Nakai A, Hirayoshi K, Hiraoka M, Abe M, Nagata K.
  Source: Japanese Journal of Cancer Research : Gann. 1992 November; 83(11): 1216-22.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1483935

- **Quercetin, an inhibitor of lactate transport and a hyperthermic sensitizer of HeLa cells.**
  Author(s): Kim JH, Kim SH, Alfieri AA, Young CW.
  Source: Cancer Research. 1984 January; 44(1): 102-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6690027

- **Quercetin, apoptosis, heat shock.**
  Author(s): Jakubowicz-Gil J, Rzymowska J, Gawron A.
  Source: Biochemical Pharmacology. 2002 December 1; 64(11): 1591-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12429348

- **Quercetin: an inhibitor of antigen-induced human basophil histamine release.**
  Author(s): Middleton E Jr, Drzewiecki G, Krishnarao D.
  Source: Journal of Immunology (Baltimore, Md. : 1950). 1981 August; 127(2): 546-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6166675

- **Quercetin: synergistic action with carboxyamidotriazole in human breast carcinoma cells.**
  Author(s): Yeh YA, Herenyiova M, Weber G.
  Source: Life Sciences. 1995; 57(13): 1285-92.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7674820

- **Quercetin-dependent reduction of salivary nitrite to nitric oxide under acidic conditions and interaction between quercetin and ascorbic acid during the reduction.**
  Author(s): Takahama U, Yamamoto A, Hirota S, Oniki T.
  Source: Journal of Agricultural and Food Chemistry. 2003 September 24; 51(20): 6014-20.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=13129310

- **Quercetin-induced apoptosis in colorectal tumor cells: possible role of EGF receptor signaling.**
  Author(s): Richter M, Ebermann R, Marian B.
  Source: Nutrition and Cancer. 1999; 34(1): 88-99.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10453447

- **Quercetin-induced apoptosis in the monoblastoid cell line U937 in vitro and the regulation of heat shock proteins expression.**
  Author(s): Rong Y, Yang EB, Zhang K, Mack P.
  Source: Anticancer Res. 2000 November-December; 20(6B): 4339-45.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11205268

- **Regioselectivity of phase II metabolism of luteolin and quercetin by UDP-glucuronosyl transferases.**
  Author(s): Boersma MG, van der Woude H, Bogaards J, Boeren S, Vervoort J, Cnubben NH, van Iersel ML, van Bladeren PJ, Rietjens IM.
  Source: Chemical Research in Toxicology. 2002 May; 15(5): 662-70.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12018987

- **Regulation of heat shock protein synthesis by quercetin in human erythroleukaemia cells.**
  Author(s): Elia G, Santoro MG.
  Source: The Biochemical Journal. 1994 May 15; 300 (Pt 1): 201-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8198534

- **Relative bioavailability of the antioxidant flavonoid quercetin from various foods in man.**
  Author(s): Hollman PC, van Trijp JM, Buysman MN, van der Gaag MS, Mengelers MJ, de Vries JH, Katan MB.
  Source: Febs Letters. 1997 November 24; 418(1-2): 152-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9414116

- **Repair of amino acid radicals of apolipoprotein B100 of low-density lipoproteins by flavonoids. A pulse radiolysis study with quercetin and rutin.**
  Author(s): Filipe P, Morliere P, Patterson LK, Hug GL, Maziere JC, Maziere C, Freitas JP, Fernandes A, Santus R.
  Source: Biochemistry. 2002 September 10; 41(36): 11057-64.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12206678

- **Repair of quercetin-induced single-strand breaks by a cell free system.**
  Author(s): Uddin S.
  Source: Biochem Mol Biol Int. 1994 February; 32(2): 341-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8019439

- **Resveratrol and quercetin down-regulate tissue factor expression by human stimulated vascular cells.**
  Author(s): Di Santo A, Mezzetti A, Napoleone E, Di Tommaso R, Donati MB, De Gaetano G, Lorenzet R.
  Source: Journal of Thrombosis and Haemostasis : Jth. 2003 May; 1(5): 1089-95.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12871381

- **Review of the biology of Quercetin and related bioflavonoids.**
  Author(s): Formica JV, Regelson W.
  Source: Food and Chemical Toxicology : an International Journal Published for the British Industrial Biological Research Association. 1995 December; 33(12): 1061-80. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8847003

- **Ribavirin and quercetin synergistically downregulate signal transduction and are cytotoxic in human ovarian carcinoma cells.**
  Author(s): Li W, Shen F, Weber G.
  Source: Oncology Research. 1999; 11(5): 243-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10608619

- **Role of cyclic AMP in the inhibition of human platelet aggregation by quercetin, a flavonoid that potentiates the effect of prostacyclin.**
  Author(s): Beretz A, Stierle A, Anton R, Cazenave JP.
  Source: Biochemical Pharmacology. 1982 November 15; 31(22): 3597-600.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6295405

- **Rutin-induced beta-glucosidase activity in Streptococcus faecium VGH-1 and Streptococcus sp. strain FRP-17 isolated from human feces: formation of the mutagen, quercetin, from rutin.**
  Author(s): MacDonald IA, Bussard RG, Hutchison DM, Holdeman LV.
  Source: Applied and Environmental Microbiology. 1984 February; 47(2): 350-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6424566

- **Safety-assessment of 3-methoxyquercetin as an antirhinoviral compound for nasal application: effect on ciliary beat frequency.**
  Author(s): Dimova S, Mugabowindekwe R, Willems T, Brewster ME, Noppe M, Ludwig A, Jorissen M, Augustijns P.
  Source: International Journal of Pharmaceutics. 2003 September 16; 263(1-2): 95-103.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12954184

- **Selective inhibition of group II phospholipase A2 by quercetin.**
  Author(s): Lindahl M, Tagesson C.
  Source: Inflammation. 1993 October; 17(5): 573-82.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8225564

- **Sensitive fluorometric method for determination of quercetin in plasma or urine.**
  Author(s): Gugler R, Dengler HJ.
  Source: Clinical Chemistry. 1973 January; 19(1): 36-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4683363

- **Sensitivity of human melanoma cells to oestrogens, tamoxifen and quercetin: is there any relationship with type I and II oestrogen binding site expression?**
  Author(s): Lama G, Angelucci C, Bruzzese N, Iacopino F, Nori SL, D'Atri S, Turriziani M, Bonmassar E, Sica G.
  Source: Melanoma Research. 1998 August; 8(4): 313-22. Erratum In: Melanoma Res 1999 October; 9(5): 530.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9764806

- **Sensitization of human Ewing's tumor cells to chemotherapy and heat treatment by the bioflavonoid quercetin.**
  Author(s): Debes A, Oerding M, Willers R, Gobel U, Wessalowski R.
  Source: Anticancer Res. 2003 July-August; 23(4): 3359-66.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12926076

- **Solid-phase extraction and gas chromatography-mass spectrometry determination of kaempferol and quercetin in human urine after consumption of Ginkgo biloba tablets.**
  Author(s): Watson DG, Oliveira EJ.
  Source: J Chromatogr B Biomed Sci Appl. 1999 February 19; 723(1-2): 203-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10080647

- **Stimulation of endogenous adenosine release by oral administration of quercetin and resveratrol in man.**
  Author(s): Blardi P, De Lalla A, Volpi L, Di Perri T.
  Source: Drugs Exp Clin Res. 1999; 25(2-3): 105-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10370871
- **Structural determinants of phosphoinositide 3-kinase inhibition by wortmannin, LY294002, quercetin, myricetin, and staurosporine.**
  Author(s): Walker EH, Pacold ME, Perisic O, Stephens L, Hawkins PT, Wymann MP, Williams RL.
  Source: Molecular Cell. 2000 October; 6(4): 909-19.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11090628

- **Structural studies on bioactive compounds. 23. Synthesis of polyhydroxylated 2-phenylbenzothiazoles and a comparison of their cytotoxicities and pharmacological properties with genistein and quercetin.**
  Author(s): Stevens MF, McCall CJ, Lelieveld P, Alexander P, Richter A, Davies DE.
  Source: Journal of Medicinal Chemistry. 1994 May 27; 37(11): 1689-95.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8201603

- **Studies on the inhibitory effects of quercetin on the growth of HL-60 leukemia cells.**
  Author(s): Kang TB, Liang NC.
  Source: Biochemical Pharmacology. 1997 November 1; 54(9): 1013-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9374422

- **Sulfation of R(-)-apomorphine in the human liver and duodenum, and its inhibition by mefenamic acid, salicylic acid and quercetin.**
  Author(s): Vietri M, Vaglini F, Pietrabissa A, Spisni R, Mosca F, Pacifici GM.
  Source: Xenobiotica; the Fate of Foreign Compounds in Biological Systems. 2002 July; 32(7): 587-94.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12162854

- **Sulforaphane and quercetin modulate PhIP-DNA adduct formation in human HepG2 cells and hepatocytes.**
  Author(s): Bacon JR, Williamson G, Garner RC, Lappin G, Langouet S, Bao Y.
  Source: Carcinogenesis. 2003 December; 24(12): 1903-11. Epub 2003 August 29.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12949046

- **Superoxide--driven oxidation of quercetin and a simple sensitive assay for determination of superoxide dismutase.**
  Author(s): Kostyuk VA, Potapovich AI.
  Source: Biochem Int. 1989 November; 19(5): 1117-24.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2561443

- **Supplementation with quercetin markedly increases plasma quercetin concentration without effect on selected risk factors for heart disease in healthy subjects.**
  Author(s): Conquer JA, Maiani G, Azzini E, Raguzzini A, Holub BJ.
  Source: The Journal of Nutrition. 1998 March; 128(3): 593-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9482769

- **Suppression of insulin-like growth factor signalling pathway and collagen expression in keloid-derived fibroblasts by quercetin: its therapeutic potential use in the treatment and/or prevention of keloids.**
  Author(s): Phan TT, See P, Tran E, Nguyen TT, Chan SY, Lee ST, Huynh H.
  Source: The British Journal of Dermatology. 2003 March; 148(3): 544-52.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12653748

- **Synergetic anticancer effect of combined quercetin and recombinant adenoviral vector expressing human wild-type p53, GM-CSF and B7-1 genes on hepatocellular carcinoma cells in vitro.**
  Author(s): Shi M, Wang FS, Wu ZZ.
  Source: World Journal of Gastroenterology : Wjg. 2003 January; 9(1): 73-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12508355

- **Synergistic action of quercetin and genistein in human ovarian carcinoma cells.**
  Author(s): Shen F, Weber G.
  Source: Oncology Research. 1997; 9(11-12): 597-602.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9563007

- **Synergistic antiproliferative activity of quercetin and cisplatin on ovarian cancer cell growth.**
  Author(s): Scambia G, Ranelletti FO, Benedetti Panici P, Bonanno G, De Vincenzo R, Piantelli M, Mancuso S.
  Source: Anti-Cancer Drugs. 1990 October; 1(1): 45-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2131036

- **Synergistic cytotoxic effect of quercetin and heat treatment in a lymphoid cell line (OZ) with low HSP70 expression.**
  Author(s): Fujita M, Nagai M, Murata M, Kawakami K, Irino S, Takahara J.
  Source: Leukemia Research. 1997 February; 21(2): 139-45.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9112431

- **Synergistic down-regulation of signal transduction and cytotoxicity by tiazofurin and quercetin in human ovarian carcinoma cells.**
  Author(s): Shen F, Herenyiova M, Weber G.
  Source: Life Sciences. 1999; 64(21): 1869-76.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10353585

- **Synthesis and antiviral activity of 7-O-(omega-substituted)-alkyl-3-O-methylquercetin derivatives.**
  Author(s): Boers F, Lemiere G, Lepoivre JA, De Groot A, Dommisse R, De Bruyne T, Vlietinck AJ, Vanden Berghe DA.
  Source: Pharmazie. 1998 August; 53(8): 512-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9741060

- **Synthesis of inositol 2-phosphate-quercetin conjugates.**
  Author(s): Calias P, Galanopoulos T, Maxwell M, Khayat A, Graves D, Antoniades HN, d'Alarcao M.
  Source: Carbohydrate Research. 1996 October 4; 292: 83-90.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8870239

- **Synthesis, characterization, antioxidative and antitumor activities of solid quercetin rare earth(III) complexes.**
  Author(s): Zhou J, Wang LF, Wang JY, Tang N.
  Source: Journal of Inorganic Biochemistry. 2001 January 1; 83(1): 41-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11192698

- **Tamoxifen and quercetin interact with type II estrogen binding sites and inhibit the growth of human melanoma cells.**
  Author(s): Piantelli M, Maggiano N, Ricci R, Larocca LM, Capelli A, Scambia G, Isola G, Natali PG, Ranelletti FO.
  Source: The Journal of Investigative Dermatology. 1995 August; 105(2): 248-53.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7636308

- **Tea and coronary heart disease: the flavonoid quercetin is more bioavailable from rutin in women than in men.**
  Author(s): Erlund I, Alfthan G, Maenpaa J, Aro A.
  Source: Archives of Internal Medicine. 2001 August 13-27; 161(15): 1919-20.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11493148

- **Test of carcinogenicity of quercetin, a widely distributed mutagen in food.**
  Author(s): Saito D, Shirai A, Matsushima T, Sugimura T, Hirono I.
  Source: Teratogenesis, Carcinogenesis, and Mutagenesis. 1980; 1(2): 213-21.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6119812

- **The bioflavonoid quercetin inhibits neutrophil degranulation, superoxide production, and the phosphorylation of specific neutrophil proteins.**
  Author(s): Blackburn WD Jr, Heck LW, Wallace RW.
  Source: Biochemical and Biophysical Research Communications. 1987 May 14; 144(3): 1229-36.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3034275

- **The combination of quercetin and cytosine arabinoside synergistically inhibits leukemic cell growth.**
  Author(s): Teofili L, Pierelli L, Iovino MS, Leone G, Scambia G, De Vincenzo R, Benedetti-Panici P, Menichella G, Macri E, Piantelli M, et al.
  Source: Leukemia Research. 1992; 16(5): 497-503.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1625476

- **The dietary flavonoid quercetin modulates HIF-1 alpha activity in endothelial cells.**
  Author(s): Wilson WJ, Poellinger L.
  Source: Biochemical and Biophysical Research Communications. 2002 April 26; 293(1): 446-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12054621

- **The effect of cisplatin, etoposide and quercetin on Hsp72 expression.**
  Author(s): Jakubowicz-Gil J, Paduch R, Gawron A, Kandefer-Szerszen M.
  Source: Pol J Pathol. 2002; 53(3): 133-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12476615

- **The effect of heat shock, cisplatin, etoposide and quercetin on Hsp27 expression in human normal and tumour cells.**
  Author(s): Jakubowicz-Gil J, Paduch R, Gawron A, Kandefer-Szerszen M.
  Source: Folia Histochem Cytobiol. 2002; 40(1): 31-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11885806

- **The effect of quercetin on apoptosis and necrosis induction in human colon adenocarcinoma cell line LS180.**
  Author(s): Pawlikowska-Pawlega B, Jakubowicz-Gil J, Rzymowska J, Gawron A.
  Source: Folia Histochem Cytobiol. 2001; 39(2): 217-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11374833

- **The effect of quercetin on cell cycle progression and growth of human gastric cancer cells.**
  Author(s): Yoshida M, Sakai T, Hosokawa N, Marui N, Matsumoto K, Fujioka A, Nishino H, Aoike A.
  Source: Febs Letters. 1990 January 15; 260(1): 10-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2298289

- **The effect of quercetin on light-induced cytotoxicity of hypericin.**
  Author(s): Mirossay A, Onderkova H, Mirossay L, Sarissky M, Mojzis J.
  Source: Physiological Research / Academia Scientiarum Bohemoslovaca. 2001; 50(6): 635-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11829327

- **The effect of the flavonoids, quercetin, myricetin and epicatechin on the growth and enzyme activities of MCF7 human breast cancer cells.**
  Author(s): Rodgers EH, Grant MH.
  Source: Chemico-Biological Interactions. 1998 November 27; 116(3): 213-28.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9920463

- **The effects of the bioflavonoid quercetin on squamous cell carcinoma of head and neck origin.**
  Author(s): Castillo MH, Perkins E, Campbell JH, Doerr R, Hassett JM, Kandaswami C, Middleton E Jr.
  Source: American Journal of Surgery. 1989 October; 158(4): 351-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2802040

- **The flavonoid, quercetin, differentially regulates Th-1 (IFNgamma) and Th-2 (IL4) cytokine gene expression by normal peripheral blood mononuclear cells.**
  Author(s): Nair MP, Kandaswami C, Mahajan S, Chadha KC, Chawda R, Nair H, Kumar N, Nair RE, Schwartz SA.
  Source: Biochimica Et Biophysica Acta. 2002 December 16; 1593(1): 29-36.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12431781

- **The flavonoids quercetin and catechin synergistically inhibit platelet function by antagonizing the intracellular production of hydrogen peroxide.**
  Author(s): Pignatelli P, Pulcinelli FM, Celestini A, Lenti L, Ghiselli A, Gazzaniga PP, Violi F.
  Source: The American Journal of Clinical Nutrition. 2000 November; 72(5): 1150-5. Erratum In: Am J Clin Nutr 2001 February; 73(2): 360.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11063442

- **The flavonoids, quercetin and isorhamnetin 3-O-acylglucosides diminish neutrophil oxidative metabolism and lipid peroxidation.**
  Author(s): Zielinska M, Kostrzewa A, Ignatowicz E, Budzianowski J.
  Source: Acta Biochimica Polonica. 2001; 48(1): 183-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11440168

- **The inhibitory effect of curcumin, genistein, quercetin and cisplatin on the growth of oral cancer cells in vitro.**
  Author(s): Elattar TM, Virji AS.
  Source: Anticancer Res. 2000 May-June; 20(3A): 1733-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10928101

- **The interaction of quercetin with human serum albumin: a fluorescence spectroscopic study.**
  Author(s): Sengupta B, Sengupta PK.
  Source: Biochemical and Biophysical Research Communications. 2002 December 6; 299(3): 400-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12445814

- **The mutant androgen receptor T877A mediates the proliferative but not the cytotoxic dose-dependent effects of genistein and quercetin on human LNCaP prostate cancer cells.**
  Author(s): Maggiolini M, Vivacqua A, Carpino A, Bonofiglio D, Fasanella G, Salerno M, Picard D, Ando S.
  Source: Molecular Pharmacology. 2002 November; 62(5): 1027-35.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12391264

- **The poliovirus-induced shut-off of cellular protein synthesis persists in the presence of 3-methylquercetin, a flavonoid which blocks viral protein and RNA synthesis.**
  Author(s): Vrijsen R, Everaert L, Van Hoof LM, Vlietinck AJ, Vanden Berghe DA, Boeye A.
  Source: Antiviral Research. 1987 January; 7(1): 35-42.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3026245

- **The quantitation of metabolites of quercetin flavonols in human urine.**
  Author(s): Gross M, Pfeiffer M, Martini M, Campbell D, Slavin J, Potter J.
  Source: Cancer Epidemiology, Biomarkers & Prevention : a Publication of the American Association for Cancer Research, Cosponsored by the American Society of Preventive Oncology. 1996 September; 5(9): 711-20.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8877063

- **The red wine phenolics trans-resveratrol and quercetin block human platelet aggregation and eicosanoid synthesis: implications for protection against coronary heart disease.**
  Author(s): Pace-Asciak CR, Hahn S, Diamandis EP, Soleas G, Goldberg DM.
  Source: Clinica Chimica Acta; International Journal of Clinical Chemistry. 1995 March 31; 235(2): 207-19.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7554275

- **The study of the quercetin action on human erythrocyte membranes.**
  Author(s): Pawlikowska-Pawlega B, Gruszecki WI, Misiak LE, Gawron A.
  Source: Biochemical Pharmacology. 2003 August 15; 66(4): 605-12.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12906925

- **The two phyto-oestrogens genistein and quercetin exert different effects on oestrogen receptor function.**
  Author(s): Miodini P, Fioravanti L, Di Fronzo G, Cappelletti V.
  Source: British Journal of Cancer. 1999 June; 80(8): 1150-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10376965

- **Transport of quercetin and its glucosides across human intestinal epithelial Caco-2 cells.**
  Author(s): Walgren RA, Walle UK, Walle T.
  Source: Biochemical Pharmacology. 1998 May 15; 55(10): 1721-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9634009

- **Treatment of interstitial cystitis with a quercetin supplement.**
  Author(s): Katske F, Shoskes DA, Sender M, Poliakin R, Gagliano K, Rajfer J.
  Source: Tech Urol. 2001 March; 7(1): 44-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11272677

- **Type II estrogen binding sites and antiproliferative activity of quercetin in human meningiomas.**
  Author(s): Piantelli M, Rinelli A, Macri E, Maggiano N, Larocca LM, Scerrati M, Roselli R, Iacoangeli M, Scambia G, Capelli A, et al.
  Source: Cancer. 1993 January 1; 71(1): 193-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8416715

- **Ultrasensitive assay for three polyphenols (catechin, quercetin and resveratrol) and their conjugates in biological fluids utilizing gas chromatography with mass selective detection.**
  Author(s): Soleas GJ, Yan J, Goldberg DM.
  Source: J Chromatogr B Biomed Sci Appl. 2001 June 5; 757(1): 161-72.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11419741

- **Urine recovery experiments with quercetin and other mutagens using the Ames test.**
  Author(s): Busch DB, Hatcher JF, Bryan GT.
  Source: Environ Mutagen. 1986; 8(3): 393-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3086073

- **Validated method for the quantitation of quercetin from human plasma using high-performance liquid chromatography with electrochemical detection.**
  Author(s): Erlund I, Alfthan G, Siren H, Ariniemi K, Aro A.
  Source: J Chromatogr B Biomed Sci Appl. 1999 April 30; 727(1-2): 179-89.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10360437

- **Vitamin C and quercetin modulate DNA-damaging effect of N-methyl-N'-nitro-N-nitrosoguanidine (MNNG).**
  Author(s): Blasiak J, Trzeciak A, Gasiorowska A, Drzewoski J, Malecka-Panas E.
  Source: Plant Foods for Human Nutrition (Dordrecht, Netherlands). 2002 Winter; 57(1): 53-61.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11855621

CHAPTER 2. NUTRITION AND QUERCETIN

Overview

In this chapter, we will show you how to find studies dedicated specifically to nutrition and quercetin.

Finding Nutrition Studies on Quercetin

The National Institutes of Health's Office of Dietary Supplements (ODS) offers a searchable bibliographic database called the IBIDS (International Bibliographic Information on Dietary Supplements; National Institutes of Health, Building 31, Room 1B29, 31 Center Drive, MSC 2086, Bethesda, Maryland 20892-2086, Tel: 301-435-2920, Fax: 301-480-1845, E-mail: ods@nih.gov). The IBIDS contains over 460,000 scientific citations and summaries about dietary supplements and nutrition as well as references to published international, scientific literature on dietary supplements such as vitamins, minerals, and botanicals.[7] The IBIDS includes references and citations to both human and animal research studies.

As a service of the ODS, access to the IBIDS database is available free of charge at the following Web address: **http://ods.od.nih.gov/databases/ibids.html**. After entering the search area, you have three choices: (1) IBIDS Consumer Database, (2) Full IBIDS Database, or (3) Peer Reviewed Citations Only.

Now that you have selected a database, click on the "Advanced" tab. An advanced search allows you to retrieve up to 100 fully explained references in a comprehensive format. Type "quercetin" (or synonyms) into the search box, and click "Go." To narrow the search, you can also select the "Title" field.

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[7] Adapted from **http://ods.od.nih.gov**. IBIDS is produced by the Office of Dietary Supplements (ODS) at the National Institutes of Health to assist the public, healthcare providers, educators, and researchers in locating credible, scientific information on dietary supplements. IBIDS was developed and will be maintained through an interagency partnership with the Food and Nutrition Information Center of the National Agricultural Library, U.S. Department of Agriculture.

The following information is typical of that found when using the "Full IBIDS Database" to search for "quercetin" (or a synonym):

- **Caffeic acid and quercetin decrease peripheral blood mononuclear cell proliferation and glutathione concentration in dietary-induced hypercholesterolemia.**
  Author(s): Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione (INRAN), Rome (Italy) Universita della Tuscia, Viterbo (Italy). Dipartimento di Scienze Ambientali
  Source: D'Aquino, M. Merendino, N. Tomassi, G. Rivista-di-Scienza-dell'Alimentazione (Italy). (February 2001). volume 30(1) page 1-4.

Additional physician-oriented references include:

- **Application of micellar electrokinetic capillary chromatography for quantitative analysis of quercetin in plant materials.**
  Author(s): Department of Chemistry, Faculty of Agriculture, University of South Bohemia, Ceske Budejovice, Czech Republic. dadakova@zf.jcu.cz
  Source: Dadakova, E Prochazkova, E Krizek, M Electrophoresis. 2001 May; 22(8): 1573-8 0173-0835
- **Arrhythmogenic peroxynitrite-induced alterations in mammalian heart contractility and its prevention with quercetin-filled liposomes.**
  Author(s): Institute of Pharmacology and Toxicology, Academy of Medical Sciences, 03057 Kiev, Ukraine. s.a.pharm@naverex.kiev.ua
  Source: Soloviev, A StefaNovember, A Parshikov, A Khromov, A Moibenko, A Kvotchina, L Balavoine, G Geletii, Y Cardiovasc-Toxicol. 2002; 2(2): 129-39 1530-7905
- **Cardiovascular effects of isorhamnetin and quercetin in isolated rat and porcine vascular smooth muscle and isolated rat atria.**
  Author(s): Department of Pharmacology, School of Medicine, University Complutense of Madrid, Madrid, Spain.
  Source: Ibarra, Manuel Perez Vizcaino, Francisco Cogolludo, Angel Duarte, Juan Zaragoza Arnaez, Francisco Lopez Lopez, Jose Gustavo Tamargo, Juan Planta-Med. 2002 April; 68(4): 307-10 0032-0943
- **Crystal structure of the copper-containing quercetin 2,3-dioxygenase from Aspergillus japonicus.**
  Author(s): Laboratory of Biophysical Chemistry, Department of Chemistry, University of Groningen, Nijenborgh 4, 9747 AG Groningen, The Netherlands.
  Source: Fusetti, Fabrizia Schroter, Klaus H Steiner, Roberto A van Noort, Paula I Pijning, Tjaard Rozeboom, Henriette J Kalk, Kor H Egmond, Maarten R Dijkstra, Bauke W Structure-(Camb). 2002 February; 10(2): 259-68 0969-2126
- **Determinations of morin, quercetin and their conjugate metabolites in serum.**
  Author(s): School of Pharmacy, China Medical College, Taichung, Taiwan, ROC.
  Source: Hsiu, S L Tsao, C W Tsai, Y C Ho, H J Chao, P D Biol-Pharm-Bull. 2001 August; 24(8): 967-9 0918-6158
- **Effects of combined quercetin and coenzyme Q(10) treatment on oxidative stress in normal and diabetic rats.**
  Author(s): Medical Sciences Program, Indiana University School of Medicine, Bloomington, Indiana 47405-7005, USA.
  Source: Coldiron, A D Jr Sanders, R A Watkins, J B 3rd J-Biochem-Mol-Toxicol. 2002; 16(4): 197-202 1095-6670

- **Effects of intestinal microflora on the bioavailability of dietary quercetin in adult mice.**
  Source: Tamura, M. Suzuki, H. Shinohara, K. Food-sci-technol-res. Tsukuba, Ibaraki : Japanese Society for Food Science and Technology, c1999-. November 2000. volume 6 (4) page 291-293. 1344-6606

- **Effects of quercetin on antioxidant defense in streptozotocin-induced diabetic rats.**
  Author(s): Medical Sciences Program, Indiana University School of Medicine, Bloomington, IN 47405-7005, USA.
  Source: Sanders, R A Rauscher, F M Watkins, J B 3rd J-Biochem-Mol-Toxicol. 2001; 15(3): 143-9 1095-6670

- **EPR characterization of the mononuclear Cu-containing Aspergillus japonicus quercetin 2,3-dioxygenase reveals dramatic changes upon anaerobic binding of substrates.**
  Author(s): Unilever Research Vlaardingen, The Netherlands.
  Source: Kooter, Ingeborg M Steiner, Roberto A Dijkstra, Bauke W van Noort, Paula I Egmond, Maarten R Huber, Martina Eur-J-Biochem. 2002 June; 269(12): 2971-9 0014-2956

- **Identification of o-quinone/quinone methide metabolites of quercetin in a cellular in vitro system.**
  Author(s): Laboratory of Biochemistry, Wageningen University, Dreijenlaan 3, 6703 HA Wageningen, The Netherlands.
  Source: Awad, Hanem M Boersma, Marelle G Boeren, Sjef van der Woude, Hester van Zanden, Jelmer van Bladeren, Peter J Vervoort, Jacques Rietjens, Ivonne M C M FEBS-Lett. 2002 June 5; 520(1-3): 30-4 0014-5793

- **Inhibitory action of quercetin on xanthine oxidase and xanthine dehydrogenase activity.**
  Source: Bindoli, A Valente, M Cavallini, L Pharmacol-Res-Commun. 1985 September; 17(9): 831-9 0031-6989

- **Mechanisms of relaxant action of 3-O-methylquercetin in isolated guinea pig trachea.**
  Author(s): Graduate Institute of Medical Sciences, Taipei Medical University, Taipei, Taiwan, ROC. wc_ko@tmu.edu.tw
  Source: Ko, Wun Chang Wang, Han Lang Lei, Chien Bang Shih, Chih Hsien Chung, Mei Ing Lin, Chung Nan Planta-Med. 2002 January; 68(1): 30-5 0032-0943

- **Modulation of DMBA induced genotoxicity in bone marrow by quercetin during skin carcinogenesis.**
  Author(s): Dept. of Cancer Chemoprevention, Chittaranjan National Cancer Institute, Calcutta, India.
  Source: Sengupta, A Ghosh, S Das, S J-Exp-Clin-Cancer-Res. 2001 March; 20(1): 131-4 0392-9078

- **Quercetin 3,7-dimethyl ether: a vasorelaxant flavonoid isolated from Croton schiedeanus Schlecht.**
  Author(s): Laboratorio de Farmacognosia y Farmacologia, Facultad de Farmacia, Universidad de Salamanca, E-37007 Salamanca, Spain.
  Source: Guerrero, M F Puebla, P Carron, R Martin, M L San Roman, L J-Pharm-Pharmacol. 2002 October; 54(10): 1373-8 0022-3573

- **Quercetin, a bioflavonoid, protects against oxidative stress-related renal dysfunction by cyclosporine in rats.**
  Author(s): Pharmacology Division, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India.

Source: Satyanarayana, P S Singh, D Chopra, K Methods-Find-Exp-Clin-Pharmacol. 2001 May; 23(4): 175-81 0379-0355

- **The antioxidative and antihistaminic properties of quercetin in ethanol-induced gastric lesions.**
  Author(s): Department of Biochemistry, The School of Medicine, Kocatepe University, Afyon 03200, Turkey. ahmetkah@aku.edu.tr
  Source: Kahraman, A Erkasap, N Koken, T Serteser, M Aktepe, F Erkasap, S Toxicology. 2003 February 1; 183(1-3): 133-42 0300-483X
- **The inhibitory action of quercetin on lipopolysaccharide-induced nitric oxide production in RAW 264.7 macrophage cells.**
  Author(s): Department of Microbiology and Immunology and Division of Bacterial Toxin, Research Center for Infectious Disease, Aichi Medical University School of Medicine, Nagakute, Aichi, Japan.
  Source: Mu, M M Chakravortty, D Sugiyama, T Koide, N Takahashi, K Mori, I Yoshida, T Yokochi, T J-Endotoxin-Res. 2001; 7(6): 431-8 0968-0519
- **Time resolved fluorescence spectroscopy of quercetin and morin complexes with Al3+.**
  Author(s): Instituto de Quimica de Sao Carlos, Universidade de Sao Paulo, Brazil.
  Source: Gutierrez, Amanda C Gehlen, Marcelo H Spectrochim-Acta-A-Mol-Biomol-Spectrosc. 2002 January 1; 58(1): 83-9 1386-1425

Federal Resources on Nutrition

In addition to the IBIDS, the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) provide many sources of information on general nutrition and health. Recommended resources include:

- healthfinder®, HHS's gateway to health information, including diet and nutrition: **http://www.healthfinder.gov/scripts/SearchContext.asp?topic=238&page=0**
- The United States Department of Agriculture's Web site dedicated to nutrition information: **www.nutrition.gov**
- The Food and Drug Administration's Web site for federal food safety information: **www.foodsafety.gov**
- The National Action Plan on Overweight and Obesity sponsored by the United States Surgeon General: **http://www.surgeongeneral.gov/topics/obesity/**
- The Center for Food Safety and Applied Nutrition has an Internet site sponsored by the Food and Drug Administration and the Department of Health and Human Services: **http://vm.cfsan.fda.gov/**
- Center for Nutrition Policy and Promotion sponsored by the United States Department of Agriculture: **http://www.usda.gov/cnpp/**
- Food and Nutrition Information Center, National Agricultural Library sponsored by the United States Department of Agriculture: **http://www.nal.usda.gov/fnic/**
- Food and Nutrition Service sponsored by the United States Department of Agriculture: **http://www.fns.usda.gov/fns/**

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering food and nutrition. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=174&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/med_nutrition.html**
- Google: **http://directory.google.com/Top/Health/Nutrition/**
- Healthnotes: **http://www.healthnotes.com/**
- Open Directory Project: **http://dmoz.org/Health/Nutrition/**
- Yahoo.com: **http://dir.yahoo.com/Health/Nutrition/**
- WebMD®Health: **http://my.webmd.com/nutrition**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,00.html**

The following is a specific Web list relating to Quercetin; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **Vitamins**

  Vitamin C and Flavonoids
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,935,00.html

- **Minerals**

  Bromelain/Quercetin
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,941,00.html

  Quercetin
  Source: Healthnotes, Inc.; www.healthnotes.com

  Quercetin
  Source: Integrative Medicine Communications; www.drkoop.com

  Quercetin
  Source: Prima Communications, Inc.www.personalhealthzone.com

  Quercetin
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10053,00.html

- **Food and Diet**

  Almonds
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/foods_view/0,1523,113,00.html

  Apples
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/foods_view/0,1523,44,00.html

  Cancer Prevention and Diet
  Source: Healthnotes, Inc.; www.healthnotes.com

  Cherries
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/foods_view/0,1523,49,00.html

  Onions
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/foods_view/0,1523,27,00.html

  Spinach
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/foods_view/0,1523,35,00.html

  Tea
  Source: Healthnotes, Inc.; www.healthnotes.com

CHAPTER 3. DISSERTATIONS ON QUERCETIN

Overview

In this chapter, we will give you a bibliography on recent dissertations relating to quercetin. We will also provide you with information on how to use the Internet to stay current on dissertations. **IMPORTANT NOTE:** When following the search strategy described below, you may discover non-medical dissertations that use the generic term "quercetin" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on quercetin, we have not necessarily excluded non-medical dissertations in this bibliography.

Dissertations on Quercetin

ProQuest Digital Dissertations, the largest archive of academic dissertations available, is located at the following Web address: **http://wwwlib.umi.com/dissertations**. From this archive, we have compiled the following list covering dissertations devoted to quercetin. You will see that the information provided includes the dissertation's title, its author, and the institution with which the author is associated. The following covers recent dissertations found when using this search procedure:

- **Comparison of the Uptake and Antioxidative Effect of Quercetin and Rutin in Erythrocytes and Ghosts Cells Following Their Delivery As Liposomes and Solutions** by Ciccone, Giuseppe; PhD from St. John's University (New York), School of Pharmacy, 2003, 202 pages
  http://wwwlib.umi.com/dissertations/fullcit/3095073
- **Natural Products As Potential Herbicide Adjuvants: Citric Acid Esters and Quercetin** by Johnson, Heather Enid; MS from Michigan State University, 2003, 67 pages
  http://wwwlib.umi.com/dissertations/fullcit/1414655
- **Supercritical Fluid Extraction of Quercetin from Onion Skins** by Martino, Karina Gorostiaga; MS from Michigan State University, 2003, 87 pages
  http://wwwlib.umi.com/dissertations/fullcit/1414670
- **The Development of General Pharmacokinetic Model for Combined Quercetin and Metabolites: A Low Bioavailable Compound with High Bioavailable Metabolites** by

Chen, Xiao; PhD from Chinese University of Hong Kong (People's Republic of China), 2003, 195 pages
http://wwwlib.umi.com/dissertations/fullcit/3104880

Keeping Current

Ask the medical librarian at your library if it has full and unlimited access to the *ProQuest Digital Dissertations* database. From the library, you should be able to do more complete searches via **http://wwwlib.umi.com/dissertations**.

CHAPTER 4. CLINICAL TRIALS AND QUERCETIN

Overview

In this chapter, we will show you how to keep informed of the latest clinical trials concerning quercetin.

Recent Trials on Quercetin

The following is a list of recent trials dedicated to quercetin.[8] Further information on a trial is available at the Web site indicated.

- **Investigating the Use of Quercetin on Glucose Absorption in Obesity, and Obesity with Type 2 Diabetes**

  Condition(s): Diabetes Mellitus; Obesity

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

  Purpose - Excerpt: Quercetin is a compound naturally found in various foods. It may have some role in the treatment of obesity and diabetes. The purpose of this study is to investigate research volunteers with obesity or obesity with type 2 diabetes to determine whether **quercetin** affects the way glucose is absorbed by the body. Thirty two participants aged 19 to 65 who are considered to be medically obese or obese with type 2 diabetes will be enrolled in this study. Before the onset of treatment, they will undergo a medical history, physical exam, blood work, and urinalysis. During the study, participants will be given an oral glucose tolerance test three times; during these tests they will receive 1 or 2 grams of **quercetin,** or placebo. Researchers will collect blood samples and analyze the effect of the treatment on blood glucose.

  Phase(s): Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00065676

[8] These are listed at **www.ClinicalTrials.gov**.

Keeping Current on Clinical Trials

The U.S. National Institutes of Health, through the National Library of Medicine, has developed ClinicalTrials.gov to provide current information about clinical research across the broadest number of diseases and conditions.

The site was launched in February 2000 and currently contains approximately 5,700 clinical studies in over 59,000 locations worldwide, with most studies being conducted in the United States. ClinicalTrials.gov receives about 2 million hits per month and hosts approximately 5,400 visitors daily. To access this database, simply go to the Web site at **http://www.clinicaltrials.gov/** and search by "quercetin" (or synonyms).

While ClinicalTrials.gov is the most comprehensive listing of NIH-supported clinical trials available, not all trials are in the database. The database is updated regularly, so clinical trials are continually being added. The following is a list of specialty databases affiliated with the National Institutes of Health that offer additional information on trials:

- For clinical studies at the Warren Grant Magnuson Clinical Center located in Bethesda, Maryland, visit their Web site: **http://clinicalstudies.info.nih.gov/**
- For clinical studies conducted at the Bayview Campus in Baltimore, Maryland, visit their Web site: **http://www.jhbmc.jhu.edu/studies/index.html**
- For cancer trials, visit the National Cancer Institute: **http://cancertrials.nci.nih.gov/**
- For eye-related trials, visit and search the Web page of the National Eye Institute: **http://www.nei.nih.gov/neitrials/index.htm**
- For heart, lung and blood trials, visit the Web page of the National Heart, Lung and Blood Institute: **http://www.nhlbi.nih.gov/studies/index.htm**
- For trials on aging, visit and search the Web site of the National Institute on Aging: **http://www.grc.nia.nih.gov/studies/index.htm**
- For rare diseases, visit and search the Web site sponsored by the Office of Rare Diseases: **http://ord.aspensys.com/asp/resources/rsch_trials.asp**
- For alcoholism, visit the National Institute on Alcohol Abuse and Alcoholism: **http://www.niaaa.nih.gov/intramural/Web_dicbr_hp/particip.htm**
- For trials on infectious, immune, and allergic diseases, visit the site of the National Institute of Allergy and Infectious Diseases: **http://www.niaid.nih.gov/clintrials/**
- For trials on arthritis, musculoskeletal and skin diseases, visit newly revised site of the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health: **http://www.niams.nih.gov/hi/studies/index.htm**
- For hearing-related trials, visit the National Institute on Deafness and Other Communication Disorders: **http://www.nidcd.nih.gov/health/clinical/index.htm**
- For trials on diseases of the digestive system and kidneys, and diabetes, visit the National Institute of Diabetes and Digestive and Kidney Diseases: **http://www.niddk.nih.gov/patient/patient.htm**
- For drug abuse trials, visit and search the Web site sponsored by the National Institute on Drug Abuse: **http://www.nida.nih.gov/CTN/Index.htm**

- For trials on mental disorders, visit and search the Web site of the National Institute of Mental Health: **http://www.nimh.nih.gov/studies/index.cfm**
- For trials on neurological disorders and stroke, visit and search the Web site sponsored by the National Institute of Neurological Disorders and Stroke of the NIH: **http://www.ninds.nih.gov/funding/funding_opportunities.htm#Clinical_Trials**

CHAPTER 5. PATENTS ON QUERCETIN

Overview

Patents can be physical innovations (e.g. chemicals, pharmaceuticals, medical equipment) or processes (e.g. treatments or diagnostic procedures). The United States Patent and Trademark Office defines a patent as a grant of a property right to the inventor, issued by the Patent and Trademark Office.[9] Patents, therefore, are intellectual property. For the United States, the term of a new patent is 20 years from the date when the patent application was filed. If the inventor wishes to receive economic benefits, it is likely that the invention will become commercially available within 20 years of the initial filing. It is important to understand, therefore, that an inventor's patent does not indicate that a product or service is or will be commercially available. The patent implies only that the inventor has "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States. While this relates to U.S. patents, similar rules govern foreign patents.

In this chapter, we show you how to locate information on patents and their inventors. If you find a patent that is particularly interesting to you, contact the inventor or the assignee for further information. **IMPORTANT NOTE:** When following the search strategy described below, you may discover non-medical patents that use the generic term "quercetin" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on quercetin, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Quercetin

By performing a patent search focusing on quercetin, you can obtain information such as the title of the invention, the names of the inventor(s), the assignee(s) or the company that owns or controls the patent, a short abstract that summarizes the patent, and a few excerpts from the description of the patent. The abstract of a patent tends to be more technical in nature, while the description is often written for the public. Full patent descriptions contain much more information than is presented here (e.g. claims, references, figures, diagrams, etc.). We

[9] Adapted from the United States Patent and Trademark Office: **http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm**.

will tell you how to obtain this information later in the chapter. The following is an example of the type of information that you can expect to obtain from a patent search on quercetin:

- **.alpha.-glycosyl quercetin, and its preparation and uses**

  Inventor(s): Iritani; Satoshi (Okayama, JP), Miyake; Toshio (Okayama, JP), Yoneyama; Masaru (Okayama, JP)

  Assignee(s): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo (okayama, Jp)

  Patent Number: 5,565,435

  Date filed: February 15, 1995

  Abstract: A novel.alpha.-glycosyl **quercetin,** wherein at least equimolar D-glucose residues are attached to **quercetin** via the.alpha.-bond, has a satisfactory water-solubility, light tolerance and stability, and exerts the inherent activity of **quercetin** in vivo. The.alpha.-glycosyl **quercetin** is prepared by a process comprising subjecting a solution containing **quercetin** and an.alpha.-glucosyl saccharide to the action of a saccharide-transferring enzyme to form an.alpha.-glycosyl **quercetin,** and recoverying the resultant.alpha.-glycosyl **quercetin.** The.alpha.-glycosyl **quercetin** can be advantageously used in combination with other materials in food products, cosmetic compositions and pharmaceutical compositions as a highly-safe and natural vitamin P-enriched agent, yellow-color-imparting agent, antioxidant, deodorant, stabilizer, quality-improving agent, antiseptic, prophylactic agent, therapeutic agent and ultraviolet-absorbing agent.

  Excerpt(s): The present invention relates to a novel.alpha.-glycosyl **quercetin,** and its preparation and uses, more particularly, it relates to (i) an.alpha.-glycosyl **quercetin** wherein at least equimolar D-glucose residues are attached to **quercetin** via the.alpha.-bond; (ii) a process for preparing.alpha.-glycosyl **quercetin** comprising subjecting a solution containing **quercetin** and an.alpha.-glucosyl saccharide to the action of a saccharide-transferring enzyme to form an.alpha.-glycosyl **quercetin;** and recoverying the resultant.alpha.-glycosyl **quercetin,** and (iii) a composition, for example, food products, cosmetics and pharmaceuticals for susceptive diseases, into which said.alpha.-glycosyl **quercetin** is incorporated. Usually, **quercetin** is widely distributed in the plant kingdom as a glycoside, i.e. rutin wherein a saccharide is attached to **quercetin** via the.beta.-bond, and can be prepared by extracting and separating such a glycoside from plants and hydrolyzing the resultant glycoside with an acid or an enzyme to remove saccharides therefrom. Quercetin has a relatively-large resonance structure in terms of the chemical structure, and this exhibits a yellow-color-imparting ability, antioxidation activity, vitamin-P activity and ultraviolet-absorbing activity. Thus, **quercetin** could be useful in the fields of food products, pharmaceuticals and cosmetics.

  Web site: http://www.delphion.com/details?pn=US05565435__

- **3-hydroxyflavones: their preparation and therapeutic application**

  Inventor(s): Creuzet; Marie-Helene (Bordeaux, FR), Feniou; Claude (Pessac, FR), Guichard; Francoise (Bordeaux, FR), Mosser; Jacqueline (Saint-Medard-En-Jalles, FR), Pontagnier; Henri (Pessac, FR), Prat; Gisele (Talence, FR)

  Assignee(s): Societe Cortial, S.a. (paris, Fr)

  Patent Number: 4,591,600

  Date filed: March 29, 1984

  Abstract: This invention relates to **quercetin** or fisetin derivatives substituted on the oxygen in the 3 position by groups such as lower alkyl, cycloalkyl, methanesulfonyl or paratoluenesulfonyl.The derivatives substituted by methanesulfonyl or paratoluenesulfonyl are obtained from a 3-O-glycoside whose phenol OH groups are blocked in the form of benzoate, and from which the OH in the 3 position is released by the action of concentrated HCl; this OH is esterified by mesityl chloride or paratoluenesulfonic acid chloride, and the benzoate groups are eliminated by soda treatment. The O derivatives substituted by alkyl or cycloakyl are prepared from a suitably substituted acetonitrile or metadiphenol; the resulting derivative reacts with 3,4-dibenzyloxybenzoic acid and the resulting flavone is debenzylated by hydrogenolysis.The derivatives, object of this invention, are useful in preventive or curative therapy of ocular and nervous complications from diabetes and are also useful as hypolipidemic or hypoglycemic agents.

  Excerpt(s): This invention relates to new 3-hydroxyflavones variously substituted on the oxygen in the 3 position, the method of preparing them and their therapeutic application. The products where R.sub.1 is OH are **quercetin** derivatives; the products where R.sub.1 is H are fisetin derivatives. Some methyl ethers of flavonols and in particular 3-O-methyl flavanols are already known. A certain number of these are natural derivatives. The Biosedra company on May 21, 1970 under No. 70 18458 patented pentabenzylquercetin used in therapy in the standard indications of flavonoids (inhibition of hyperpermeability and reduction of capillary fragility).

  Web site: http://www.delphion.com/details?pn=US04591600__

- **Analogues or derivatives of quercetin (prodrugs)**

  Inventor(s): Golding; Bernard Thomas (Newcastle Upon Tyne, GB), Griffin; Roger John (Morpeth, GB), Quarterman; Charmaine Paulina (Redditch, GB), Slack; John Alfred (Solihull, GB), Williams; Jonathan Gareth (Nuneaton, GB)

  Assignee(s): Cobra Therapeutics Limited (gb)

  Patent Number: 6,258,840

  Date filed: July 20, 1999

  Abstract: Novel carbamate ester analogues or derivatives of **Quercetin** (prodrugs) are provided which have enhanced aqueous solubility and which are especially suitable for use as biodegradable prodrugs in pharmaceutical compositions formulated for clinical use.

  Excerpt(s): The present invention relates to the field of biochemistry and medicine. More particularly it relates to **Quercetin** analogues or derivatives and preparations thereof. These compounds are potentially useful in tumour chemotherapy, treatment of inflammation and allergy. The flavonoid **Quercetin** (3,3',4',5,7-pentahydroxyflavone)

has been shown to inhibit the activity of a variety of enzymes including the calcium- and phospholipid dependent protein kinase (protein kinase C) in vivo and in vitro. Furthermore, it synergistically enhances the antiproliferative activity of cis-diaminedichloroplatinum II (cis-DDP) both in vitro and in vivo and therefore is of interest as a promising therapeutic agent for use in the chemotherapy of human tumours. However, Phase I clinical trials have proved problematic owing to the limited solubility of **Quercetin** in pharmaceutically acceptable solvents, and this characteristic has prevented its further clinical development. The present invention has developed from efforts to produce analogues or derivatives of **Quercetin** having greater aqueous solubility, more suitable for use in pharmaceutical formulations and capable of acting as prodrugs which can be biologically degraded or broken down to release **Quercetin** within the body after being administered to a patient in need of treatment.

Web site: http://www.delphion.com/details?pn=US06258840__

- **Antioxidant derived from lentil and its preparation and uses**

  Inventor(s): Muanza; David N. (Houston, TX), Ronzio; Robert A. (Houston, TX), Sparks; William S. (Bellaire, TX)

  Assignee(s): Biotics Research Corporation (stafford, Tx)

  Patent Number: 5,762,936

  Date filed: September 4, 1996

  Abstract: The preparation of extracts of seed coats of lentil (Lens esculenta) as a representative member of the Leguminosae, extracted with a range of volatile solvents, such as methanol, acetone, singly or a mixture with water, and food solvents, such as ethyl acetate and ethanol, to yield such extracts that are water-soluble, which contain a rich mixture of condensed tannins (procyanidins and prodciphinidin as glycosides), together with a flavanone (luteolin) and flavonols (quercetin, kaempferol) and phenolic acids (ferulic acid, protocatechuic acid, caffeic acid) and which possess the ability to quench organic free radicals, to scavenge superoxide, to inhibit the oxidation of water soluble nutrients such as vitamin C, as well as the oxidation of fat-soluble nutrients such as essential fatty acids, and to limit damage due to oxidants linked to inflammatory conditions, and to inhibit certain cells responsible for inflammation, is disclosed.

  Excerpt(s): In one aspect, the invention relates to an antioxidant derived from lentil seed husks. In another aspect, the invention relates to a process for preparing the antioxidant. In yet another aspect, the invention relates to uses for the antioxidant. Plant seed coats sometimes possess antioxidants that protect the seed and embryo against oxidative damage during seed storage and germination. For example, the antioxidative components of seed coats of tamarind (Tamrindus indica L.) were studied by Tsuda et al (J. Agric. Food Chem. 1994:42:2641-2674). Seed coats were extracted with ethanol, ethyl acetate, an ethyl acetate-ethanol mixture or methanol. All of the solvent extracts inhibited the oxidation of linoleic acid, with the ethyl acetate extract being somewhat more active. The major active components were identified as ethyl 3,4 dihydroxybenzoate, 2-hydroxy 3,4 dihydroxyacetophenone, 3,4 dihydroxyphenyl acetate and epicatechin. Essentially no antioxidant activity was detected in the germ. It was reported in Tsuda et al. (J. Agric. Food Chem. 1994:42:248-251) that pigments from red and green pea bean (Phaseola vulgaris L.) blocked the autoxidation of linoleic acid. Pelargonidin glucoside, delphinidin glucoside and cyanidin glucoside were identified in an extract prepared from 0.5% trifluroacetic and 80% ethanol. Later studies

demonstrated that cyanidin and its glucoside block lipid peroxidation of erythrocyte membranes and liposomes. (Tsuda et al., J. Agric. Food Chem. 1994:42:2407-10).

Web site: http://www.delphion.com/details?pn=US05762936__

- **Composition and process for dissolving a sparingly water-soluble flavonoid**

  Inventor(s): Horikawa; Hiroshi (Osaka, JP), Moriwaki; Masamitsu (Osaka, JP), Nishimura; Masato (Osaka, JP)

  Assignee(s): San-ei Chemical Industries, Ltd. (osaka, Jp)

  Patent Number: 5,122,381

  Date filed: August 20, 1990

  Abstract: A process for dissolving a sparingly water-soluble flavonoid in an aqueous medium by use of one or more kinds of quercetin-3-0-glycosides, which is applicable to the case of using the sparingly water-soluble flavonoid as an antifading agent for colored drinks.

  Excerpt(s): The present invention relates to a process for dissolving a sparingly water-soluble flavonoid. Rutin, which is one of the typical sparingly water-soluble flavonoids, has pharmacological actions such as antioxidizing action, blood vessel reinforcing action and the like. Alternatively, rutin has been frequently used as an antifading agent for colored drinks. Where rutin is used as the antifading agent, it is desirable that at least about 0.01 W/V% of rutin be present in the aqueous solution. However, rutin is sparingly water-soluble, and its solubility is about 0.008 % in water at an ordinary temperature. Some methods for dissolving rutin in water for pharmaceutical purpose are known, i.e., adding an aliphatic compound having an amino group to rutin (Japanese Published Examined Patent Application No. 1677/1950), and allowing a halogenated acetic acid or Rongalite to act on rutin for improving in its water-solubility (Japanese Published Examined Patent Application No. 2724/1951; No. 1285/1954).

  Web site: http://www.delphion.com/details?pn=US05122381__

- **Compositions and methods for regulating metabolism and balancing body weight**

  Inventor(s): Jiang; David (Irvine, CA), Yegorova; Inna (Northridge, CA)

  Assignee(s): Braswell; A. Glenn (miami, Fl)

  Patent Number: 6,399,089

  Date filed: May 15, 2000

  Abstract: Compositions and methods for balancing body weight by inhibiting re-uptake of serotonin, regulating metabolism, potentiating insulin, and inhibiting lipogenesis, in a mammal. The compositions comprise chromium, fat-free cocoa powder, Hypericum perforatum extract, Garcinia cambogia extract, Ginkgo biloba extract, Panax ginseng extract, and **quercetin.**

  Excerpt(s): The present invention relates to the administration of compositions and methods for balancing body weight by inhibiting re-uptake of serotonin, regulating metabolism, potentiating insulin, and inhibiting lipogenesis, in a mammal. Obesity is a serious heath problem both in the United States as well as world-wide. Results from the National Health and Nutrition Examination Survey III show that one in three Americans

are at least twenty percent overweight. Kuczmarski et al., 272 JAMA 205-211 (1994). Other studies have shown that the prevalence of obesity increases threefold between the ages of 20 and 50, however, this varies for men and women. In particular, the weights of men appear to stabilize after age 50 and then begin to decline around age 60. Women, however, generally continue to gain weight until age 60, and it is not until after age 60 that their weight begins to decline. Kaplan and Sadock, SYNOPSIS OF PSYCHIATRY 731 (1998). Obesity is a condition characterized by excessive accumulation of fat on the body. Obesity can be measured by either body weight or by body mass index (BMI). By convention, obesity is said to be present when body weight exceeds by 20 percent the weight listed in typical height-weight index tables. The other measurement of obesity, BMI, is the amount of fat present in the body and is considered a reliable indication of fatness in non-athletic adults. The BMI may be calculated by using the following formula: BMI equals [body weight in kg] divided by [height in meters].sup.2. In general, a normal BMI is between the range of 20 to 25, whereas the BMI of obese individuals is greater than or equal to 30.

Web site: http://www.delphion.com/details?pn=US06399089__

- **Food supplement formulation**

  Inventor(s): Green; Lonny S. (10825 Cherry Hill Dr., Glen Allen, VA 23059)

  Assignee(s): None Reported

  Patent Number: 6,605,306

  Date filed: July 1, 2002

  Abstract: A food supplement formulation comprises **quercetin,** bromelain, papain, passiflora incarnata, valeriana officinalis, gotu kola, usnea barbata, althea officinalis, and L-arginine.

  Excerpt(s): The present invention relates generally to a food supplement formulation. More particularly the invention is directed to a food supplement formulation which may additionally aid the relief of interstitial cystitis. Herbal formulations have been used as dietary supplements and natural medicaments for many years. In addition to providing compounds necessary to the human body for good nutrition, such formulations additionally may aid the body in dealing with a number of urinary tract maladies. In addition to desiring a supplement to the daily diet, many persons suffer from a condition known as interstitial cystitis in which the afflicted person experiences frequent urination, pain in the genital/pelvic region, pain with sexual activity, and like maladies.

  Web site: http://www.delphion.com/details?pn=US06605306__

- **Herbal caffeine replacement composition and food products incorporating same**

  Inventor(s): Zhou; James H. (32 Hallmark Dr., Wallingford, CT 06492)

  Assignee(s): None Reported

  Patent Number: 6,416,806

  Date filed: March 20, 2000

  Abstract: A caffeine replacement composition including a first plant extract portion containing at least one flavoglycoside selected from the group consisting of **quercetin,** quercetagetin, ginkgetin, biloba, isorhamnetin, kaempferol, rutin, isoginkgetin, ginnol,

and mixtures thereof; a second plant extract portion containing Ginkgolactones; and a third plant extract portion containing a component selected from the group consisting of puerarin, acetylpuerarin, puerarin-xyloside and combinations thereof. These extracts are preferably obtained from Ginkgo biloba and kudzu (Pueraria).

Excerpt(s): Coffee is heavily consumed around the world for various reasons, one of which is the enhanced alertness provided by the caffeine contained in coffee. Unfortunately, caffeine is quite addictive. Approximately 2.1 billion cups of coffee are consumed per day worldwide, with four hundred twenty million cups being consumed daily in the United States. Numerous other products such as chocolate, cola, and the like also contain caffeine and are consumed in large quantities.

Web site: http://www.delphion.com/details?pn=US06416806__

- **Insulin sensitivity maintenance and blood sugar level maintenance formulation for the prevention and treatment of diabetes**

  Inventor(s): Gorsek; Wayne F. (Boynton Beach, FL)

  Assignee(s): Vitacost.com, Inc. (boynton Beach, Fl)

  Patent Number: 6,572,897

  Date filed: July 3, 2002

  Abstract: A composition that contains the most potent combination of nutrients with clinical studies proven to assist in the maintenance of insulin sensitivity and healthy blood sugar levels. The formulation contains essential amounts of Alpha Lipoic Acid, Chromium, Lutein, Bioflavonoids(quercetin and rutin), Mormordica Charantia extract, Corosolic Acid, and Gymnema Sylvestre Extract, as well as other ingredients and healthy filler ingredients.

  Excerpt(s): The invention relates to a composition that contains the most potent combination of nutrients with clinical studies proven to assist in the maintenance of insulin sensitivity and healthy blood sugar levels. The advanced formulation is designed to promote healthy blood sugar levels as people age which is critical to good health. High levels of blood sugar are associated with adverse affects on our vision, heart/circulation, kidneys and nervous system. This is commonly associated with the disease of diabetes. Individual vitamins, minerals, herbs and antioxidants have been studied for their efficacy at promoting healthy blood sugar and protecting cells from the damage of elevated blood sugar levels. This prevents heart disease and strokes.

  Web site: http://www.delphion.com/details?pn=US06572897__

- **Medical food for treating inflammation-related diseases**

  Inventor(s): Bland; Jeffrey S. (Fox Island, WA), Darland; Gary K. (Gig Harbor, WA), Irving; Tracey A. (Gig Harbor, WA), Liska; DeAnn J. (Gig Harbor, WA), Lukaczer; Daniel O. (Gig Harbor, WA)

  Assignee(s): Healthcomm International, Inc. (gig Harboor, Wa)

  Patent Number: 6,210,701

  Date filed: April 30, 1999

Abstract: The present invention provides dietary supplements, medical foods and methods effective to ameliorate at least one of the symptoms, preferably all of the symptoms, of an inflammation-related disease. The dietary supplements of the present invention include rosemary, curcumin and at least one component selected from the group consisting of **quercetin** and rutin. The medical foods of the present invention include rosemary and at least one component selected from the group consisting of curcumin, **quercetin** and rutin. The medical foods of the present invention also include macronutrients. The methods of the present invention include the step of administering to a person suffering from an inflammation-related disease an effective amount of a dietary supplement or medical food of the present invention.

Excerpt(s): The present invention relates to dietary supplements and medical foods for treating inflammation-related diseases. The compositions of the present invention include rosemary. In 1948, the World Health Organization defined health as not only the absence of disease, but also the presence of physical, mental, and social well-being. (Constitution of the World Health Organization. In: World Health Organization, Handbook of Basic Documents. 5th ed. Geneva: Palais des Nations, 3-20 (1952)). The status of a patient's physical, mental, and social functioning is often referred to in the literature as quality-of-life and is used as a measure of health outcome. In the past 25 years, there has been a nearly exponential increase in the evaluation of quality-of-life as a technique of clinical research as a component of determining clinical benefit from an intervention protocol. For example, in 1973, only five articles listed quality-of-life as a key word in the Medline database, whereas in the subsequent four years there were successively 195, 273, 490, and 1,252 such articles. (Testa M A and Simonson D C, N Eng J Med. 334:835-840 (1996). In 1998, approximately 3,724 articles listed quality-of-life as a key word. Thus, the health outcome, or quality-of-life, associated with a clinical intervention has been recognized as an important tool in measuring effectiveness and costs of medical care. (Wilson I B and Cleary P D., JAMA., 273:59-65 (1995)). Extensive research has resulted in the development of instruments that measure health outcome using quality-of-life tools that follow academically well-established and statistically validated psychometric principles. (Ware J E Jr., J Chronic Dis., 40:473-480 (1987); Spilker B., Quality of Life and Pharmacoeconomics in Clinical Trials, 2nd ed. Philadelphia, Pa.: Lippincott-Raven Co; 1995.) One such tool is the SF-36 (Short form-36), which has been widely used in clinical trials and in clinical practice to assess health outcome. (Clancy C M and Eisenberg J M, Science, 282:245-246 (1998)). The SF-36 was derived from the Medical Outcomes Study, which involved 11,336 patients from 523 different clinical sites. (Ware J E, Sherbourne C D, Davies A R. Developing and testing the MOS 20-item short-form health survey. In: Stewart A L and Ware J E, eds., Measuring functioning and well-being: The Medical Outcomes Study approach. Durham, N.C.: University Press, 277-290 (1992); Ware J E. SF-36 Health Survey: manual and interpretation guide. Boston, Mass.: Nimrod Press; 2:1-3:22 (1993)). The validity and reliability of the SF-36 has been proven in several studies in which researchers tested internal consistency, within subject reliability, and differentiation between patient populations. (McHorney C A, et al., Medical Care, 31:247-263 (1993); McHorney C A, et al., Medical Care, 30:S253-S265 (1992); Jenkinson C, et al., Br Med J, 306:1436-1440 (1993); Brazier J E, et al., Br Med J. 305:160-164 (1992)). The SF-36 has been shown to predict the course of depression during a two-year study, and to be lower overall in patients who experience chronic health disorders. (Wells K B, et al., Archives General Psychiatry, 49:788-794 (1992); Schlenk E A, et al., Quality of Life Res., 7:57-65 (1998)).

Web site: http://www.delphion.com/details?pn=US06210701__

- **Method of frying foods in the presence of a spice antioxidant**

  Inventor(s): Kanamori; Takeshi (Chiba, JP), Kimura; Yukichi (Narashino, JP)

  Assignee(s): Lion Corporation (tokyo, Jp)

  Patent Number: 4,363,823

  Date filed: November 18, 1980

  Abstract: Fried foods are produced by adding an antioxidant to a frying oil and then frying a desired food stuff therein at 100.degree.-250.degree. C. The antioxidant is obtained by subjecting a starting material, selected from the group consisting of herb family spices, residues obtained after the recovery of essential oils from herb family spices, oleoresins obtained from the extraction of herb family spices with a polar solvent, and oleoresins and extracted residues obtained from the extraction of herb family spices with a non-polar solvent, to an extraction treatment with a polar solvent to obtain an extract, decoloring the extract with an adsorbent, concentrating the extract after separation of the adsorbent, forming an aqueous dispersion from the concentrate, steam distilling the aqueous dispersion to produce a steam distilled residue and recovering an insoluble part from the steam distilled residue. At least one additive selected from the group consisting of a mixture of dihydroxyacetone and amino acid, **quercetin,** citric acid, miso peptide, casein peptied, and phytic acid is added to the frying oil and/or the food stuff.

  Excerpt(s): The present invention relates to a method of producing fried foods such as fried noodles, fried potato chips, fried corn chips, fried nuts, fried crackers and the like, and more particularly to a method of producing fried foods which are resistant to oil oxidation and have an improved shelf life. In the production of fried foods such as fried noodles, potato chips, fried crackers and the like, a frying oil containing a synthetic antioxidant such as BHA (butylhydroxy anisole) has hitherto been used in order to prevent oxidation of oil in the fried foods to improve the shelf life thereof. However, the use of such synthetic antioxidants as BHA is strictly restricted with respect to addition amount, kind of foods to be fried with and the like according to food regulations. For this reason, it has also been proposed to add tocopherol (vitamin E), vitamin C, a mixture of tocopherol and melanoidin, citric acid or the like as an antioxidant to frying oil. However, the addition effect of such antioxidants is fairly poor as compared with that of BHA.

  Web site: http://www.delphion.com/details?pn=US04363823__

- **Methods for modulating T cell responses by manipulating intracellular signal transduction**

  Inventor(s): June; Carl H. (Rockville, MD)

  Assignee(s): The United States of America AS Represented by the Secretary of the Navy (washington, Dc)

  Patent Number: 6,632,789

  Date filed: April 29, 1994

  Abstract: Methods for modulating T cell responses by manipulating intracellular signals associated with T cell costimulation are disclosed. The methods involve inhibiting or stimulating the production of at least one D3-phosphoinositide in a T cell. Production of D3-phosphoinositides can be manipulated by contacting a T cell with an inhibitor or

activator of phosphatidylinositol 3-kinase. Inhibitors of phosphatidylinositol 3-kinase for use in the methods of the invention include wortmannin and **quercetin,** or derivatives or analogues thereof. The methods of the invention can further comprise modulating other intracellular signals associated with costimulation, such as protein tyrosine phosphorylation, for example by modulating the activity of a protein tyrosine kinase or a protein tyrosine phosphatase in the T cell. Inhibition of a T cell response in accordance with the disclosed methods is useful therapeutically in situations where it is desirable to inhibit an immune response to an antigen(s), for example in organ or bone marrow transplantation and autoimmune diseases. Alternatively, stimulation of a T cell response in accordance with the disclosed methods is useful therapeutically to enhance an immune response to an antigen(s), for example to stimulate an anti-tumor response in a subject with a tumor, to stimulate a response against a pathogenic agent or increase the efficacy of vaccination. Novel screening assays for identifying inhibitors or activators of phosphatidylinositol 3-kinase, which can be used to inhibit or stimulate a T cell response, are also disclosed.

Excerpt(s): The induction of antigen-specific T cell responses involves multiple interactions between cell surface receptors on T cells and ligands on antigen presenting cells (APCs). The primary interaction is between the T cell receptor (TCR)/CD3 complex on a T cell and a major histocompatibility complex (MHC) molecule/antigenic peptide complex on an antigen presenting cell. This interaction triggers a primary, antigen-specific, activation signal in the T cell. In addition to the primary activation signal, induction of T cell responses requires a second, costimulatory signal. In the absence of proper costimulation, TCR signaling can induce a state of anergy in the T cell. Subsequent appropriate presentation of antigen to an anergic T cell fails to elicit a proper response (see Schwartz, R. H. (1990) Science 248:1349). A costimulatory signal can be triggered in a T cell through a T cell surface receptor, such as CD28. For example, it has been demonstrated that suboptimal polyclonal stimulation of T cells (e.g. by anti-CD3 antibodies or phorbol ester, either of which can provide a primary activation signal) can be potentiated by crosslinking of CD28 with anti-CD28 antibodies (Linsley, P. S. et al. (1991) J. Exp. Med. 173:721; Gimmi, C. D. et al. (1991) Proc. Natl. Acad. Sci. USA 88:6575). Moreover, stimulation of CD28 can prevent the induction of anergy in T cell clones (Harding, F. A. (1992) Nature 356:607-609). Natural ligands for CD28 have been identified on APCs. CD28 ligands include members of the B7 family of proteins, such as B7-1(CD80) and B7-2 (B70) (Freedman, A. S. et al. (1987) J. Immunol. 137:3260-3267; Freeman, G. J. et al. (1989) J. Immunol. 143:2714-2722; Freeman, G. J. et al. (1991) J. Exp. Med. 174:625-631; Freeman, G. J. et al. (1993) Science 26:909-911; Azuma, M. et al. (1993) Nature 366:76-79; Freeman, G. J. et al. (1993) J. Exp. Med. 178:2185-2192). In addition to CD28, proteins of the B7 family have been shown to bind another surface receptor on T cells related to CD28, termed CTLA4, which may also play a role in T cell costimulation (Linsley, P. S. (1991) J. Exp. Med. 174:561-569; Freeman, G. J. et al. (1993) Science 262:909-911). The elucidation of the receptor:ligand relationship of CD28/CTLA4 and the B7 family of proteins, and the role of this interaction in costimulation, has led to therapeutic approaches involving manipulation of the extracellular interactions of surface receptors on T cells which bind costimulatory molecules. For example, a CTLA4Ig fusion protein, which binds to both B7-1 and B7-2 and blocks their interaction with CD28/CTLA4, has been used to inhibit rejection of allogeneic and xenogeneic grafts (see e.g., Turka, L. A. et al. (1992) Proc. Natl. Acad. Sci. USA 89:11102-11105; Lenschow, D. J. et al. (1992) Science 257:789-792). Similarly, antibodies reactive with B7-1 and/or B7-2 have been used to inhibit T cell proliferation and IL-2 production in vitro and inhibit primary immune responses to antigen in vivo (Hathcock K. S. et al. (1993) Science 262:905-907; Azuma, M. et al. (1993) Nature 366:76-

79; Powers, G. D. et al. (1994) Cell. Immunol. 153:298-311; Chen C. et al. (1994) J. Immunol. 152:2105-2114). Together, these studies indicate that T cell surface receptors which bind costimulatory molecules such as B7-1 and B7-2 are desirable targets for manipulating immune responses.

Web site: http://www.delphion.com/details?pn=US06632789__

- **Pharmaceutical composition from Tienchi**

  Inventor(s): Liu; Yaguang (67-08 168th Street, Fresh Meadows, NY 11365)

  Assignee(s): None Reported

  Patent Number: 4,755,504

  Date filed: December 22, 1986

  Abstract: A pharmaceutical composition containing saponin and **quercetin,** derived from Tienchi, is effective in treatment of circulatory disease and as health food. Processes for producing these components are provided.

  Excerpt(s): This invention relates to a new pharmaceutical composition comprising two active ingredients: **quercetin** and saponin derived from the root Tienchi, the Chinese name of Panax Notoginseng (Burk) F. H. Chen, a member of the ginseng family growing in the provinces of Yunnan and Guangxi in Southern China. Tienchi is the source of a valuable Chinese traditional medicine for human consumption. In recent years, there has been much interest in plant-derived health foods and medicines, particularly ginseng. There are many varieties of ginseng and each variety of the ginseng plant contains many pharmacologically active components. Correctly chosen mixtures of such components often have unexpected benefical effects. The prior art usually addresses the preparation of such components alone in pure form. U.S. Pat. No. 3,661,890 discloses a process for converting rutin into 3-O-alkyl **quercetin** by organic synthsis. Two alkyl **quercetin** derivatives are reported to have antimicrobial activity.

  Web site: http://www.delphion.com/details?pn=US04755504__

- **Pharmaceutical compositions and methods for improving wrinkles and other skin conditions**

  Inventor(s): Murad; Howard (4316 Marina City Dr., Marina del Rey, CA 90292)

  Assignee(s): None Reported

  Patent Number: 5,804,594

  Date filed: January 22, 1997

  Abstract: This application relates to a pharmaceutical composition for the prevention and treatment of skin conditions in a patient having a sugar compound that is converted to a glycosaminoglycan in the patient in an amount sufficient to thicken the skin, a primary antioxidant component in an amount sufficient to substantially inhibit the formation of collagenase and elastase, at least one amino acid component in an amount sufficient to assist in the thickening of the skin, and at least one transition metal component in an amount effective to bind collagen and elastic fibers and rebuild skin. In one preferred form, the composition further includes a catechin-based preparation, a glucosamine or a pharmaceutically acceptable salt or ester thereof, and a chondroitin or a pharmaceutically acceptable salt or ester thereof. In a more preferred form, the

invention further includes a vitamin E source, a cysteine source, a vitamin B.sub.3 source, **quercetin** dihydrate, pyridoxal 5 phosphate-Co B.sub.6, a methionine source, and a vitamin A source. The invention further relates to a method for the prevention or treatment of skin conditions by administering the pharmaceutical composition in an amount therapeutically effective to modify the thickness of the skin to prevent or treat at least one skin condition.

Excerpt(s): This application relates to pharmaceutical compositions, as well as methods, to supplement collagen and elastic tissues and thicken the dermis for the treatment of wrinkles and other skin conditions. Human skin is a composite material of the epidermis and the dermis. The topmost part of the epidermis is the stratum corneum. This layer is the stiffest layer of the skin, as well as the one most affected by the surrounding environment. Below the stratum corneum is the internal portion of the epidermis. Below the epidermis, the topmost layer of the dermis is the papillary dermis, which is made of relatively loose connective tissues that define the micro-relief of the skin. The reticular dermis, disposed beneath the papillary dermis, is tight, connective tissue that is spatially organized. The reticular dermis is also associated with coarse wrinkles. At the bottom of the dermis lies the subcutaneous layer. The principal functions of the skin include protection, excretion, secretion, absorption, thermoregulation, pigmentogenesis, accumulation, sensory perception, and regulation of immunological processes. These functions are detrimentally affected by the structural changes in the skin due to aging and excessive sun exposure. The physiological changes associated with skin aging include impairment of the barrier function and decreased turnover of epidermal cells, for example. ›Cerimele, D., et al., Br. J. Dermatol., 122 Suppl. 35, p. 13-20 (April 1990)!.

Web site: http://www.delphion.com/details?pn=US05804594__

- **Process for enhancing the sunlight stability of rubrolone**

  Inventor(s): Iacobucci; Guillermo A. (Atlanta, GA), Sweeny; James G. (Atlanta, GA)

  Assignee(s): The Coca-cola Company (atlanta, Ga)

  Patent Number: 4,285,985

  Date filed: March 25, 1980

  Abstract: Disclosed herein is a process for reducing the tendency of the pigment rubrolone to fade upon exposure to direct sunlight wherein the pigment is combined with quercetin-5'-sulfonate. Pigment compositions comprised of rubrolone and quercetin-5'-sulfonate as well as food compositions containing these components are also disclosed.

  Excerpt(s): The present invention relates generally to the stabilization of pigments against sunlight-induced bleaching and, in particular, relates to such stabilization of the pigment rubrolone. The preparation and structural analysis of rubrolone is described in Palleroni, et al., The Journal of Antibiotics, vol. 31, no. 12, p. 1218 (1978); Schuep, et al., The Journal of Antibiotics, vol. 31, no. 12, p. 1226 (1978); and U.S. Pat. No. 4,057,533. Although the significant water solubility of rubrolone makes it attractive as a colorant for foods, and particularly for water-based products such as beverages, we have found that rubrolone undergoes degradation upon direct exposure to sunlight with a resultant color loss in products colored therewith.

  Web site: http://www.delphion.com/details?pn=US04285985__

- **Production of quercetin glucuronide**

  Inventor(s): Kinoshita; Yasuhiro (Neyagawa, JP), Yamamoto; Yoshikazu (Neyagawa, JP)

  Assignee(s): Nippon Paint Co., Ltd. (osaka, Jp)

  Patent Number: 5,212,076

  Date filed: September 16, 1991

  Abstract: The present invention provides a dye other than red and purple which is obtained from cultured cells of Euphorbia milli. The present invention also provides cultured cells containing **quercetin** glucuronide in a large amount, derived from tissues or cells of Euphorbia milli.

  Excerpt(s): The present invention relates to a process for preparing **quercetin** glucuronide obtained from cultured cells derived from plant tissues and cells of Euphorbia milli. A dye is generally formulated in food as a food colorant to make it clear or vivid, but synthetic colorants are restrictively used because of toxicity (e.g. mutability). A colorant which is derived from natural materials, especially natural plants, is therefore much desired in practical use in view of safety. However, the growth of the natural plants is dependent on surrounding conditions, such as season, climate, temperature, latitude, land shape, water transportation, soil and the like, the colorants derived from the natural plants are not constantly and stably supplied. A large cultivation using arable land contends with food production and therefore the supply of the natural plants has a limit. Also, as mentioned above, the productivity of the plants has a limit which makes cost-up.

  Web site: http://www.delphion.com/details?pn=US05212076__

- **Proteoglycan compositions for treatment of cardiovascular inflammatory diseases**

  Inventor(s): Theoharides; Theoharis C. (14 Parkman St., Brookline, MA 02446)

  Assignee(s): None Reported

  Patent Number: 6,624,148

  Date filed: December 27, 2002

  Abstract: Compositions with synergistic anti-inflammatory effects in inflammatory diseases resulting from activation and consequent degranulation of mast cells and followed by secretion of inflammatory biomolecules from the activated mast cells, composed of a heavily sulfated, non-bovine proteoglycan such as shark cartilage chondroitin sulfate C, and one or more of a hexosamine sulfate such as D-glucosamine sulfate, a flavone such as **quercetin,** an unrefined olive kernel extract that increases absorption of these compositions in various routes of administration, S-adenosylmethionine, a histamine-1 receptor antagonist, a histamine-3 receptor agonist, an antagonist of the actions of CRH, caffeine, and a polyamine.

  Excerpt(s): The invention is generally related to the treatment of inflammatory conditions. More specifically, the invention is related to compositions containing inhibitors of mast cell activation and secretion such as a proteoglycan that are designed to be used as dietary supplements or adjuvants to conventional approved medications for the relief of inflammatory conditions. There have been a number of mostly anecdotal reports that the proteoglycan chondroitin sulfate, as well as glucosamine sulfate, a product of the intestinal breakdown of proteoglycans, may be helpful in relieving the pain of osteoarthritis:--Shute N. Aching for an arthritis cure. US News and World

Report, Feb. 10, 1997.--Cowley G. The arthritis cure? Newsweek, Feb. 17, 1997; Foreman J., People, and their pets, tout arthritis remedy. The Boston Globe, Apr. 7, 1997; Tye L. Treatment gains scientific attention. The Boston Globe, Sep. 25, 2000. A recent meta-analysis showed potential therapeutic benefit of chondroitin sulfate and/or glucosamine in osteoarthritis [McAlindon et al. J Am Med Assn. 283:1469 (2000)], while a double-blind clinical trial with glucosamine showed definite benefits in osteoarthritis with respect to both pain and radiographic joint appearance [Reginster et al., Lancet 337:252 (2001)]. However, less than 5% of the chondroitin sulfate in commercially available preparations is absorbed orally, because the size of the molecule and the degree of sulfation impede its absorption from the gastrointestinal tract. Furthermore, such commercial preparations use chondroitin sulfate obtained from cow trachea, with the possible danger of contracting spongiform encephalopathy or "mad cow disease". In fact, the European Union has banned even cosmetics that contain bovine-derived products.

Web site: http://www.delphion.com/details?pn=US06624148__

- **Quercetin chalcone and methods related thereto**

  Inventor(s): Birdsall; Timothy C (Sandpoint, ID), Czap; Al F (Sandpoint, ID)

  Assignee(s): Thorne Research, Inc. (sandpoint, Id)

  Patent Number: 5,977,184

  Date filed: September 15, 1995

  Abstract: Quercetin chalcone, an effective, soluble and bioavailable bioflavonoid, is disclosed. Also disclosed are compositions containing **quercetin** chalcone in combination with an acceptable carrier and/or diluent, as well as methods for administration thereof to warm-blooded animals. Such administration is beneficial in generally maintaining good health of the animal and, more specifically, for the treatment of allergies.

  Excerpt(s): The present invention relates to a **quercetin** derivative, **quercetin** chalcone, as well as compositions and methods for preparation and use thereof. Bioflavonoids are a group of naturally occurring compounds and are widely distributed among plants, including most all citrus fruits, rose hips and black currants. Such compounds are generally isolated from the rinds of oranges, tangerines, lemons, limes, kumquats and grapefruits by commercial extraction methods. Bioflavonoids have been determined to be involved with homeostasis of the walls of small blood vessels. In addition, these compounds have been found to contribute to the maintenance of normal blood vessel conditions by decreasing capillary permeability and fragility. Bioflavonoids have also been found to have activity as a histamine release blocker (treatment of allergies), a xanthine oxidase inhibitor (treatment of gout), an aldose reductase inhibitor (prevention of diabetic complications), a phospholiphase A2 and lipoxygenase inhibitor (anti-inflammatory), an aerobic glycosis inhibitor (an anti-cancer agent), and a tumor necrosis factor potentiator (an antiviral agent.

  Web site: http://www.delphion.com/details?pn=US05977184__

- **Quercetin pentamethyl carbamate and a process for its preparation**

  Inventor(s): Aedo; Dionisio M. (Barcelona, ES), Ricard; Rene (Barcelona, ES), Taya; Miguel M. (Barcelona, ES)

  Assignee(s): Rogador Sociedad Anonima (esplugas DE Lloebregat, Es)

  Patent Number: 4,202,825

  Date filed: March 7, 1978

  Abstract: A derivative of **quercetin, quercetin** pentamethyl carbamate, with therapeutical properties and a process for its preparation.

  Excerpt(s): This new **quercetin** derivative has capillary protective and tonifying properties for the venous wall, which properties are of great interest for patients suffering from internal and external varicose veins of the legs, patients suffering from haemorrhoids, capillarites in diabetic retinitis, essential arterial hypertension, etc. This compound, the chemical skeleton of which is **quercetin,** contains the free hydroxyls thereof protected by methylcarbamate radicals. In this way there is obtained a product which retains the recognised vasoprotector action of the flavonoids, at the same time as it becomes very absorbable orally.

  Web site: http://www.delphion.com/details?pn=US04202825__

- **Quercetin-containing coloring**

  Inventor(s): Kuwahara; Nobuhiro (Yokohama, JP), Okemoto; Hisashi (Yokohama, JP), Tanaka; Takemi (Yokohama, JP)

  Assignee(s): Ensuiko Sugar Refining Co., Ltd. (yokohama, Jp)

  Patent Number: 5,445,842

  Date filed: November 22, 1993

  Abstract: A quercetin-containing colorant which has as an effective component a **quercetin** included by cyclodextrin. Effective use thereof as a colorant is possible by imparting thereto resistance against light, heat and chemicals to **quercetin** which is a flavonoid yellow substance. The colorant may be added to various food products for use of **quercetin** as a stable coloring matter.

  Excerpt(s): The present invention relates to a quercetin-containing colorant, and specifically it relates to a quercetin-containing colorant which has been stabilized by forming an inclusion complex with cyclodextrin. **Quercetin** is a yellow substance contained in plants such as Japanese pagoda, onion and the like, and according to the present invention it is stabilized for use as a colorant. A method has been proposed for using **quercetin** in food preservation, for the improvement of solubility and as an antioxidant, by its inclusion complex with cyclodextrin (Japanese Patent Publication No. Hei 2-268643), but no method has been heretofore known for the use of quercetin/cyclodextrin inclusion complexes as pigments. Quercetin is alkali-soluble, but at pHs lower than neutral it becomes poorly soluble and its color changes considerably.

  Web site: http://www.delphion.com/details?pn=US05445842__

- **Skin care compositions containing naringenin and/or quercetin and a retinoid**

  Inventor(s): Burger; Allan Robert (Passaic, NJ), Granger; Stewart Paton (Paramus, NJ), Scott; Ian Richard (Allendale, NJ)

  Assignee(s): Chesebrough-pond's Usa Co., Division of Conopco, Inc. (greenwich, Ct)

  Patent Number: 5,665,367

  Date filed: September 27, 1996

  Abstract: Quercetin and/or naringenin in combination with either retinol or retinyl ester resulted in a synergistic inhibition of keratinocyte differentiation. The effects of the retinol or retinyl esters in combination with naringenin and/or **quercetin** were analogous to treatment with retinoic acid.

  Excerpt(s): The invention relates to skin care compositions containing specific flavonoids and a retinoid, preferably retinol or retinyl ester. Retinol (vitamin A) is an endogenous compound which occurs naturally in the human body and is essential for normal epithelial cell differentiation. Natural and synthetic vitamin A derivatives have been used extensively in the treatment of a variety of skin disorders and have been used as skin repair or renewal agents. Retinoic acid has been employed to treat a variety of skin conditions, e.g., acne, wrinkles, psoriasis, age spots and discoloration. See e.g., Vahlquist, A. et al., J. Invest. Dermatol., Vol. 94, Holland D. B. and Cunliffe, W. J. (1990), pp. 496-498; Ellis, C. N. et al., "Pharmacology of Retinols in Skin", Vasel, Karger, Vol. 3, (1989), pp. 249-252; Lowe, N. J. et al., "Pharmacology of Retinols in Skin", Vol. 3, (1989), pp. 240-248; PCT Patent Application No. WO 93/19743. It is believed that the use of retinol or esters of retinol would be preferred over retinoic acid. Retinol is an endogenous compound which occurs naturally in the human body and is essential for normal epithelial cell differentiation. Retinol is also considered much safer than retinoic acid. Esters of retinol hydrolyze in-vivo to produce retinol. retinol and retinyl esters are considered ,safer than retinoic acid. Unfortunately, retinol and retinyl esters are less effective than retinoic acid at providing skin benefits. The present invention is based, in part, on the discovery that a combination of retinol or retinyl esters with specific flavonoids results in a synergistic inhibition in keratinocyte differentiation. The effects of the flavonoids (specifically, naringenin and quercetin) combined with retinol or a retinyl ester were analogous to the effects of retinoic acid. Thus, a mixture of the specific flavonoids with retinol or retinyl esters mimics retinoic acid yet is easier and safer to use than retinoic acid.

  Web site: http://www.delphion.com/details?pn=US05665367__

Patent Applications on Quercetin

As of December 2000, U.S. patent applications are open to public viewing.[10] Applications are patent requests which have yet to be granted. (The process to achieve a patent can take several years.) The following patent applications have been filed since December 2000 relating to quercetin:

[10] This has been a common practice outside the United States prior to December 2000.

- **Antioxidant composition comprising propionyl L-carnitine and a flavonoid against throm-bosis and atherosclerosis**

  Inventor(s): Cavazza, Claudio; (Roma, IT)

  Correspondence: Nixon & Vanderhye, PC; 1100 N Glebe Road; 8th Floor; Arlington; VA; 22201-4714; US

  Patent Application Number: 20030206895

  Date filed: June 4, 2003

  Abstract: A composition is disclosed which comprises as characterizing active ingredients propionyl L-carnitine and a flavonoid, typically **quercetin** or its 3-rutinoside, rutin, for the prevention and/or therapeutic treatment of various alterations and pathological states induced by free radicals and by thrombotic or atherosclerotic abnormalities, that may take the form of a dietary supplement, dietetic support or of an actual medicine.

  Excerpt(s): The present invention relates to a composition for the prevention and/or treatment of thrombotic or atherosclerotic abnormalities, allergic inflammatory reactions, diseases brought about by the release of free radicals and by increased platelet aggregation. Accordingly, the composition may take the form and exert the action of a dietary supplement or of an actual medicine, depending upon the support or preventive action, or the strictly therapeutic action, which the composition is intended to exert in relation to the particular individuals it is to be used in. (b) a flavonoid, preferably selected from the group comprising **quercetin,** rutin, myricetin, myricitrin or mixtures thereof or extracts of natural vegetable products containing such flavonoids.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Avocado concentrate and process for preparing same**

  Inventor(s): Carre, Eric; (Grayslake, IL)

  Correspondence: Gerald T. Shekleton, ESQ.; Welsh & Katz, LTD.; 22nd Floor; 120 S. Riverside Plaza; Chicago; IL; 60606; US

  Patent Application Number: 20030165598

  Date filed: February 27, 2002

  Abstract: A composition for stabilizing avocado meat is disclosed that comprises acids from cultured dextrose, erythorbic acid, ascorbic acid, **quercetin** and inulin that are present in weight ratios of about 1:2-2.5:2.25-2.75:0.9-1.1:6-7, respectively. That composition is admixed in a color-stabilizing amount with avocado meat to form a color-stabilized avocado concentrate. A method for the preparation of a color-stabilized avocado concentrate is also disclosed.

  Excerpt(s): This invention pertains to the preparation of food stuffs. More particularly, the present invention relates to a composition for stabilizing avocado meat, a stabilized avocado concentrate suitable for eating itself or for the preparation of a food such as guacamole, and a process for preparing a stabilized avocado concentrate. Browning, or oxidative darkening, of food products can result from both enzymatic and non-enzymatic chemical reactions in food. Both enzymatic and non-enzymatic browning constitute serious problems for the food industry and result in millions of pounds of wasted food products each year. Several physical methods have been developed for inhibiting oxidation and the resultant browning. One of the most common and well-

known methods is heat inactivation of the enzymes through pasteurization or similar processes. Additional physical methods involve vacuum, dehydration, and the like, all of which have drawbacks either in the loss of flavor from the food or ineffectiveness in the result.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Blends of isoflavones and flavones**

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  Patent Application Number: 20020068121

  Date filed: August 15, 2001

  Abstract: Blends of **quercetin** and isoflavones from the group consisting of genestein, daidzein and glycetin display synergistic effects when applied as anti-inflammatory agent or as skin agent in particular for anti ageing purposes.

  Excerpt(s): Isoflavones are known as health components that can be applied to prevent or treat many health deficiencies or to achieve certain health effects not directly related with a health deficiency. E.g. these compounds are known to achieve benefits in the women's health area in particular for postmenopausal women. These effects are disclosed in e.g. U.S. Pat. No. 5,498,631; WO 98/56373; WO 98/08503; U.S. Pat. Nos. 5,733,926; 5,952,374 and many other references. Health effects that are also attributed to isoflavones include skin effects and anti-inflammatory effects. Although for a few of these effects some experimental support can be found in the literature the majority of the pretended effects are mere statements in the prior art without any experimental support. We found on basis of a number of tests specifically developed in order to find experimental support to confirm the pretended effects that indeed some of the pretended effects exist however only to a low or medium extend. whereas in the text the possibility of synergy between one or more of the components is suggested, there is no clear teaching that a synergy could be achieved by combining the components from which we found that they gave a synergy with respect to anti-inflammatory effects or with respect to skin benefits in particular to antiageing effects. In fact the preferred antioxidants are in this WO'607 bioflavanoids such as proanthocyanidins. The neovascular regulator can be genistein, daidzein or a soy isolate.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Combination of catechin and quercetin for pharmaceutical or dietary use**

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  Patent Application Number: 20040014686

  Date filed: August 14, 2003

  Abstract: The invention relates to a composition for pharmaceutical or dietary use that possesses antioxidant activity and characterized in that it contains as active principle a

combination of catechin **quercetin,** which exert a synergistic action when combined in mutual molar ratios selected within a critical range, from 6:1 to 3:1 mol of catechin:quercetin.

Excerpt(s): It is known that moderate consumption of red wine is associated with a decreased incidence of cardiovascular events (More, Medicine 1986:65:245-67; Graziano, N. Engl. J. Med. 1993:329:1829-34). Constituents of red wine such as flavonoids have been considered to be involved in the aforementioned beneficial effects on the cardiovascular system on account of their ability to inhibit platelet function. Indeed, experimental studies in vivo on animals demonstrated that both red wine and grape juice reduced platelet activation in canine coronary arteries affected by stenosis. A similar effect was observed with flavonoids isolated from red wine, including **quercetin,** indicating that these constituents of red wine were involved in eliminating the reduction in flow caused by platelet aggregation (Slane, Clin. Res. 1994; 42; 169A (abstr.)). Several studies in vitro have demonstrated that flavonoids such as resveratrol, **quercetin** and catechin inhibit platelet aggregation; however, one potential limitation of these studies arises from the fact that the concentration employed to obtain this inhibition was too high. Accordingly, some authors have called into question the antiplatelet activity exerted in vivo by these constituents of red wine (Janssen, Am. J. Clin. Nutr. 1998; 67; 255-62). It should be noted that research into the effects of flavonoids on platelet function has until now focused on each component considered individually; there has never been an investigation of whether the flavonoids can act in combination to inhibit platelet activation. Following the consumption of red wine, more than one flavonoid is circulating in the human body, so such a synergy might be relevant, in that lower concentrations of flavonoids than those studied previously might modulate platelet activity. Another question concerning the antiplatelet effect of the flavonoids is their mechanism of action. Although the results of the majority of studies are in agreement that the flavonoids interact with the metabolism of arachidonic acid, thus inhibiting the production of thromboxane A.sub.2, the mechanism on which this action is based has never been studied. The flavonoids are phenolic compounds whose antioxidant effects are correlated with the deoxidation of radicals rather than with chelation of the metal. It has been suggested that inhibition both of platelet function and of metabolism of arachidonic acid depends on the antioxidant activity, but no study envisaged investigations to discover whether the flavonoids interact with platelet activation by contrasting the effect of oxidizing species formed in situ. The present invention was therefore based on investigating whether the flavonoids, or some of them selectively, could act synergistically to inhibit platelet function, and to interfere with platelet function on the basis of an antioxidant effect. As a result of this study, the present invention proposes a composition for pharmaceutical or dietary use that possesses high antioxidant activity, characterized in that this active principle comprises a combination of catechin and **quercetin** in the molar ratio in the range between approx 6:1 and 3:1, respectively.

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- **Composition and method for correcting a dietary phytochemical deficiency**

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  Patent Application Number: 20020025350

  Date filed: June 12, 2001

  Abstract: The invention is directed to a composition and method for correcting a dietary phytochemical deficiency, wherein the phytochemicals include sulphoraphane, naringen, hesperidin, narirutin, **quercetin,**.beta.-carotene, lutein, lycopene, and isoflavones. The composition may also comprise additional vitamins and minerals.

  Excerpt(s): This application claims priority of U.S. Provisional Application No. 60/210,746, filed June 12, 2000. The present invention relates to a composition and method for correcting a dietary inadequacy, including a diet-induced inadequacy, of phytochemicals, vitamins, and minerals. Dietary supplements are often used for the treatment and prevention of various disorders. Such supplements are often targeted for specific diseases. For example, U.S. Pat. No. 5,976,568 is directed to a modular system of dietary supplement compositions for the treatment and prevention of, among other things, coronary heart disease. The modular system comprises several different modules, or formulas, each of which is a different combination of vitamins and minerals such as antioxidants and folic acid.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Composition and method for treating non-bacterial prostatitis**

  Inventor(s): Kastke, Floyd A.; (Los Angeles, CA)

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  Patent Application Number: 20010025059

  Date filed: January 9, 2001

  Abstract: A composition and a method for treatment of prostate related dysfunction and, particularly, non-bacterial prostatitis and, even more particularly, non-bacterial chronic prostatitis. The composition primarily relies upon the use of a bioflavonoid and, particularly, that bioflavonoid known as **quercetin.** The **quercetin** is mixed with a proteolytic digestive enzyme protease, such as bromelin and papain, as the primary active ingredients. However, the composition may optionally and beneficially include other prostatitis affecting agents, such as zinc derived from zinc gluconate, cranberry, saw palmetto, as well as some other active and non-active ingredients.

  Excerpt(s): This application is a continuation-in-part of my co-pending U.S. provisional patent application Ser. No. 60,175,286, filed Jan. 10, 2000, for "Composition for Treating Non-Bacterial Prostatitis". The invention primarily relates to a composition and method for the treatment of non-bacterial prostatitis and, more particularly, to a composition and method for treating non-bacterial chronic prostatitis syndromes using bioflavonoids in a treatment composition and in a treatment method. Prostatitis is a name commonly used for a non-specific group of prostate related problems and is often characterized by

prostatic pain, which may actually adopt the form of phantom symptomatic pain. At present, the cause for many of the forms of prostatitis is not fully known. As a result, there is frequently no known cure for non-bacterial chronic prostatitis, although there are several therapies of varying effectiveness, and usually limited effectiveness. These therapies are generally designed to address the issues of pain and discomfort as well as the other symptoms arising from this condition of prostatitis, but are not specific to any effective cure or permanent treatment therefor.

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- **Compositions and methods for prostate and kidney health and disorders, an herbal preparation**

  Inventor(s): Chou, Wen Hsien; (Kowloon, HK)

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  Patent Application Number: 20030108629

  Date filed: July 16, 2002

  Abstract: A composition including an aliquot of the herb Herba Epimedii; and an aliquot of at least three supplemental herbs selected from the group consisting of Fructus Rosae laevigatae; Fructus Rubi; Fructus Psoralea; Radix Morindae officinalis; Fructus Schisandrac chinensis; Fructus Ligustri lucidi; Semen Cuscutae; and Radix Astragali. A composition including icariin; ursolic acid; ellagic acid; psoralen; deoxyschizandrin; oleanolic acid; **quercetin;** aslvagaloside; and an extract of the herb Radix Morindae Officinalis. Methods including administering a composition directed at treatment of various kidney disorders or the promotion of kidney health and to the overall health of the kidney, including the use of a composition in the treatment of prostate cancer, prophylatic prostate health, reduction of polyuria, incontinence, proteinuria, as well as for sexual satisfaction.

  Excerpt(s): This application claims the benefit of the earlier filing date of co-pending provisional application Serial No. 60/306,112, filed Jul. 17, 2001, by Wen Hsein Chou, titled "Compositions and Methods for the Treatment of Prostate Disorders with an Herbal Preparation," and incorporated herein by reference. Presented in this application are herbal compositions and methods that provide a treatment for prostate gland and kidney disorders. In particular, a composition for the treatment or improvement of prostatitis and methods and compositions for the treatment or improvement of prostate carcinoma and relieving symptoms and improving objective signs of prostate disorders. In a further aspect, compositions and methods related to the overall health of the kidney, including the use of an herbal combination in the reduction of polyuria, incontinence, and proteinuria, as well as relieving the symptoms of these conditions. In a still further aspect, compositions and methods that improve sexual satisfaction. The kidney is either one or a pair of organs in the dorsal region of the vertebrate abdominal cavity, functioning to maintain proper water and electrolyte balance, regulate acid-base concentration, and filter the blood of metabolic wastes, which are excreted as urine. Thus, the consequence of a kidney disorder can constitute an overall imbalance in the organism as a whole. Many organs such as the bladder, intestine, heart, lungs, prostate depend on the ability of the kidney to filter out the undesirable debris of the body and maintain overall homeostasis.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Compositions comprising a mixture of bioflavonols**

  Inventor(s): Buchholz, Herwig; (Frankfurt, DE), Meduski, Jerzy; (Playa Del Rey, CA)

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  Patent Application Number: 20030022845

  Date filed: September 26, 2002

  Abstract: The present invention relates to novel compositions containing a mixture of two or three bioflavonols like isoquercetin, quercetin-4'-glycoside, rutin and **quercetin,** which show differences in their pharmacokinetics. These compositions are useful as food supplements possessing preventive properties against damage to human tissues due to their antioxidant properties. Furthermore, these compositions secure a continuum of the presence of bioflavonols having the same aglycone in human plasma over an extended period of time.

  Excerpt(s): Structures of body tissues are susceptible to damage caused by the oxidative stress, e.g., by the accumulation of reactive oxygen species during ageing, chronic environmental stress, inflammations or general metabolic dysfunctions. The role of reactive oxygen species in aetiology of human diseases (e.g. cancer, atherosclerosis, rheumatoid arthritis, inflammatory bowel diseases, immune system dysfunctions, brain function decline, connective tissue dysfunctions) is well established. Chronic exposure to reactive oxygen species leads to chronic intracellular damage, to oxidative stress and premature ageing. Cells of the human body possess metabolic antioxidant defences which are supported by dietary antioxidants. The early observations of the antioxidant defence metabolic processes involved flavonoids. Quercetin, an aglycone, isoquercetin, a **quercetin** glycoside, and rutin, a **quercetin** rutinoside, are flavonols that are being recently extensively studied due to their antioxidant properties. Gycosylation of an aglycone makes the molecule less reactive towards free radicals and more water-soluble. Kind and the position of the glycosylation are the sources of the pharmacokinetic differences among flavonols that have the same aglycone.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Compositions for the treatment of lupus**

  Inventor(s): Ziegler, Randy H.; (Newport Coast, CA)

  Correspondence: Reed Smith Crosby Heafey Llp; 1901 Avenue OF The Stars, Suite 700; Los Angeles; CA; 90067; US

  Patent Application Number: 20040028675

  Date filed: April 30, 2003

  Abstract: A composition and a method for the amelioration of Lupus, related rheumatic and autoimmune diseases such as fibromyalgia and inflammatory joint diseases. The composition consists of a bioflavonoid combined with Bromelain. Vitamin C may be added to the composition to improve its efficacy. The preferred flavonoid is Luteolin or **Quercetin.** Myricetin may also be used as may be a glycoside such as Rutin that contains either Luteolin, **Quercetin** or Myricetin as an aglycone. Other effective flavonoids can be selected by their ability to interact with the Kv1.3 channel of lymphocytes. In a preferred method of treatment a mixture of flavonoid, Bromelain and Vitamin C is administered

at least daily by an oral route. A mixture of 500 mg **Quercetin,** 500 mg Bromelain and 500 mg Vitamin C administered three times daily is effective.

Excerpt(s): The present application is a continuation in part of, and claims priority from, PCT/US02/39297 designating the United States which was based on and claimed priority from U.S. Provisional Patent Application No. 60/339,199 filed on Dec. 7, 2001. The present invention concerns a treatment for autoimmune rheumatic diseases and for joint diseases. Lupus Erythematosus ("Lupus") is a chronic inflammatory disease that can affect the skin, joints, blood, and kidneys as well as other parts of the body. Lupus is an "autoimmune" disease in which the immune system makes antibodies directed against parts of the body. Normally antibodies react only with bacteria, viruses and other foreign substances. When "self" antibodies are made, damage can occur either through direct antibody mediated attack on body tissues or indirectly from immune complexes. Immune complexes are the reaction products between portions of the body's tissues and the antibodies. These complexes build up in the skin or in joints or in kidneys and cause many of the symptoms of Lupus. Although many cases of Lupus are mild, the disease may cause serious life-threatening symptoms.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Compositions for treatment of diseases arising from secretion of mast cell biochemicals**

  Inventor(s): Theoharides, Theoharis C.; (Brookline, MA)

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  Patent Application Number: 20030232100

  Date filed: May 16, 2003

  Abstract: Compositions for treatment of diseases arising from products secreted by activated tissue mast cells, composed of, as active ingredients, unprocessed olive kernel (pit) extract that increases absorption of these compositions in various routes of administration, and one or more of a heavily sulfated, non-bovine proteoglycan such as shark cartilage chondroitin sulfate C, a hexosamine sulfate such as D-glucosamine sulfate, a flavonoid such as **quercetin,** S-adenosylmethionine, a histamine-1 receptor antagonist, a histamine-3 receptor agonist, a CRH antagonist, caffeine, fragments of myelin basic protein, rutin, polyunsaturated fatty acids, Bitter Willow Extract and a polyamine.

  Excerpt(s): This application is a continuation-in-part of co-pending U.S. Ser. No. 09/773,576, filed Feb. 2, 2001, which is a divisional of co-pending U.S. Ser. No. 09/056,707, filed Apr. 8, 1998. The invention generally relates to the treatment of diseases arising from mast cell secretory products. More specifically, the invention relates to compositions containing inhibitors of mast cell activation and secretion that are designed to be used as dietary supplements alone or as or adjuvants to conventional approved medications for the relief of said diseases. The expression "arising from" is intended herein to mean any process that leads to pathophysiology that involves any product secreted from mast cells. The term "secretory product" is intended to mean any biochemical(s) secreted from mast cells, whether preformed or newly synthesized. By "disease" is mean any condition, syndrome or other pathophysiological entity leading to dysfunction in the patient. A recent meta-analysis showed potential therapeutic benefit of chondroitin sulfate and/or glucosamine in osteoarthritis [McAlindon et al. J Am Med

Assn. 283:1469 (2000)], while a double-blind clinical trial with glucosamine showed definite benefits in osteoarthritis with respect to pain, radiographic joint appearance and progression [Reginster et al., Lancet 337:252 (2001); Pavelka et al., Arch Intern Med. 162:2113(2002)]. However, less than 5% of the chondroitin sulfate in commercially available preparations is absorbed orally, because the size of the molecule and the degree of sulfation impede its absorption from the gastrointestinal tract, which greatly reduces the effectiveness of such preparations. Furthermore, such commercial preparations use chondroitin sulfate obtained from cow trachea, with the possible danger of contracting spongiform encephalopathy or "mad cow disease". In fact, the European Union has banned even cosmetics that contain bovine-derived products.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Dermal cytochrome P450 1A inhibitors and enhancers**

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  Patent Application Number: 20030166583

  Date filed: February 22, 2002

  Abstract: The present invention provides dermal cytochrome P450 1A (CYP1A) inhibitors, which include free base or pharmacologically acceptable salt of (-)-epicatechin, (+)-epicatechin, (+)-limonene, 3-phenylpropyl acetate,.alpha.-naphthoflavone, apigenin, baicalein, baicalin,.beta.-myrcene, catechin,.beta.-naphthoflavone, cineole, daidzein, daidzin, diosmin, ergosterol, formononetin, gallic acid, genistein, glycyrrhizin, glycyrrhizic acid, hesperetin, hesperidin, isoquercitrin, kaempferol, lauryl alcohol, luteolin, luteolin-7-glycoside, narigenin, narigin, nordihydroguaiaretic acid, oleanolic acid, paeoniflorin, **quercetin,** quercitrin, rutin, swertiamarin, terpineol, trans-cinnamaldehyde, trans-cinnamic acid, umbelliferone, genkwanin, homoorientin, isovitexin, neohesperidin, wongonin, capillarisin, liquiritin, ethyl myristate, poncirin, and ursolic acid. The CYP1A inhibitors can be co-administered with compounds with first-pass effect such as dermatological drugs to improve the bioavailability of the drugs. The present invention also provides dermal CYP1A enhancers, which include (+)-catechin, (-)-epicatechin, (+)-epicatechin, (+)-limonene, 3-phenylpropyl acetate, apigenin, baicalein, baicalin,.beta.-myrcene, cineole, daidzein, daidzin, diosmin, ergosterol, formononetin, gallic acid, glycyrrhizin, hesperidin, isoquercitrin, kaempferol, lauryl alcohol, luteolin, luteolin-7-glycoside, narigin, nordihydroguaiaretic acid, paeoniflorin, protocatechuic acid, **quercetin,** quercitrin, rutin, swertiamarin, terpineol, trans-cinnamic acid, umbelliferone, and umbellic acid.

  Excerpt(s): The present invention relates to chemical compounds, which inhibit or enhance dermal cytochrome P450 1A (CYP1A) enzymatic activity. The preferred examples of the inhibitors of CYP 1A include free base or pharmacologically acceptable salt of kaempferol, luteolin-7-glycoside, terpineol,.alpha.-naphthoflavone,.beta.-naphthoflavone, and hesperetin. The CYP1A inhibitors can be co-administered with dermatological drugs to improve the bioavailability and suppress the first-pass effect of the dermatological drugs. The preferred dermatological drug is retinoid, most favorably retinoic acid. The present invention also provides dermal CYP1A enhancers. The preferred CYP1A enhancers include (-)-epicatechin, cineole, narigin, and protocatechuic acid. The dermal CYP1A enhancers improve the CYP1A enzymatic activity so as to

reduce the bioavailability of the drugs. Cytochrome P450 is a heme-containing protein which was discovered by its unusually reduced carbon monoxide difference spectrum that has an absorbance at 450 nm, which is caused by a thiolate anion acting as the fifth ligand to the heme. The most common reaction catalyzed by cytochrome P450 is hydroxylation, often of a lipophilic substrate. Thus, cytochrome P450 proteins are frequently called hydroxylases. Cytochrome P450 has been proven to be the major enzyme responsible for the first pass metabolism. The first-pass effect of drugs is referred to as the process of drug degradation during a drug's transition from site of entry (such as initial ingestion) to circulation in the blood stream. The first-pass effect affects bioavailability of a drug. Clinically, cytochrome P450 not only increases the first-pass metabolism in a large scale, but also magnifies the therapeutic effect as well as side effects of the drug because of drug interactions.

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- **Dietary supplement compositions**

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  Patent Application Number: 20040005311

  Date filed: June 16, 2003

  Abstract: The invention is directed to dietary supplements including a core of lysine and bromelain and, optionally, including lycopene. Supplements can further include at least one of Vitamin C, Vitamin E, Vitamin B12, CoEnzymeQ10, lycopene, folic acid, selenium, lecithin and **quercetin.** Supplements can also further include lutein or xanthin. A preferred supplement includes 5000 mg lysine, 125 mg bromelain, 250 mg Vitamin C,800 IU Vitamin E, 500 mcg Vitamin B 12, 200 mg CoEnzymeQ10, 10 mg lycopene, 800 mcg folic acid, 100 mcg selenium, 250 mg **quercetin** and 2400 mg lecithin. The supplements have dietary uses or can be used to alleviate dementia-related symptoms.

  Excerpt(s): This application claims the benefit of prior-filed provisional patent application U.S. Serial No. 60/219,959, filed Jul. 20, 2000, the entire content of which is incorporated herein by this reference. It is well known that the diets of many persons in today's modem societies are lacking in a variety of important or essential vitamins, minerals and other natural elements. From this knowledge has arisen a vast interest in dietary supplementation, to restore desirable or necessary levels of various vitamins, minerals and the like. Dietary supplementation has also become very popular as a natural approach to achieving improved health effects including weight loss, appetite suppression, increased energy levels, increased muscle mass, improved learning and memory and the like. Moreover, it is well known that many disorders are the result of dietary deficiencies wherein the body is starved of certain vitamins, minerals and other natural elements. Other disorders are simply the result of aging. Disorders due to aging may result if the body produces too much or too little of certain enzymes or hormones, thereby affecting the body's metabolism. Some disorders can be treated or corrected by supplementing missing natural elements which are ordinarily not found in the average diet. Through the use of a daily supplement, supplying these missing vitamins and natural elements, the symptoms of various disorders may improve or disappear entirely.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **DIETARY SUPPLEMENTS CONTAINING NATURAL INGREDIENTS**

  Inventor(s): PERKES, LYNN; (REXBURG, ID)

  Correspondence: Richard J. Anderson; Fish & Richardson P.C., P.A.; 60 South Sixth Street; Suite 3300; Minneapolis; MN; 55402; US

  Patent Application Number: 20020048575

  Date filed: May 11, 1999

  Abstract: The invention provides a dietary supplement comprising at least one flavonoid source and an enzyme, that is effective for inhibiting in vivo platelet activity and LDL cholesterol oxidation in a mammal at a dosage of about 30 mg/Kg or less. The supplement may contain flavonoid sources found in grape seed extracts, grape skin extracts, bilberry extracts, ginkgo biloba extracts or the flavonoid **quercetin.** The supplement may also contain fungal proteases, acid stable proteases and bromelain. The invention further provides a method for using the dietary supplement and an article of manufacture containing the supplement.

  Excerpt(s): The invention relates to dietary supplements containing natural ingredients. Coronary artery disease, myocardial infarction, stroke, and other vascular occlusions are major health concerns. A common characteristic of these diseases is the atherosclerotic process, or the narrowing of arteries. Blood platelets contribute to the development and progression of the atherosclerotic process by releasing growth factors, chemotactic substances and other factors that accelerate the atherosclerotic process. In addition, platelet aggregation at or near the point of arterial damage contributes to the development of atherosclerosis and acute platelet thrombus formation. Low density lipoprotein (LDL) cholesterol is also associated with atherosclerosis. It has been proposed that nonatherogenic LDL cholesterol circulating in the blood is converted to atherogenic LDL cholesterol through oxidation of polyunsaturated lipids, which leads to modification of the apoprotein.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Dietary supplements for treating inflammation-related diseases**

  Inventor(s): Bland, Jeffrey S.; (Fox Island, WA), Darland, Gary K.; (Gig Harbor, WA), Irving, Tracey A.; (Gig Harbor, WA), Liska, DeAnn J.; (Gig Harbor, WA), Lukaczer, Daniel O.; (Gig Harbor, WA)

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  Patent Application Number: 20020051826

  Date filed: January 29, 2001

  Abstract: The present invention provides dietary supplements, medical foods and methods effective to ameliorate at least one of the symptoms, preferably all of the symptoms, of an inflammation-related disease. The dietary supplements of the present invention include rosemary, curcumin and at least one component selected from the group consisting of **quercetin** and rutin. The medical foods of the present invention include include rosemary and at least one component selected from the group consisting of curcumin, **quercetin** and rutin. The medical foods of the present invention also include macronutrients. The methods of the present invention include the step of

administering to a person suffering from an inflammation-related disease an effective amount of a dietary supplement or medical food of the present invention.

Excerpt(s): The present invention relates to dietary supplements and medical foods for treating inflammation-related diseases. The compositions of the present invention include rosemary. In 1948, the World Health Organization defined health as not only the absence of disease, but also the presence of physical, mental, and social well-being. (Constitution of the World Health Organization. In: World Health Organization, Handbook of Basic Documents. 5th ed. Geneva: Palais des Nations, 3-20 (1952)). The status of a patient's physical, mental, and social functioning is often referred to in the literature as quality-of-life and is used as a measure of health outcome. In the past 25 years, there has been a nearly exponential increase in the evaluation of quality-of-life as a technique of clinical research as a component of determining clinical benefit from an intervention protocol. For example, in 1973, only five articles listed quality-of-life as a key word in the Medline database, whereas in the subsequent four years there were successively 195, 273, 490, and 1,252 such articles. (Testa MA and Simonson DC, N Eng J Med. 334:835-840 (1996). In 1998, approximately 3,724 articles listed quality-of-life as a key word. Thus, the health outcome, or quality-of-life, associated with a clinical intervention has been recognized as an important tool in measuring effectiveness and costs of medical care. (Wilson IB and Cleary PD., JAMA., 273:59-65 (1995)). Extensive research has resulted in the development of instruments that measure health outcome using quality-of-life tools that follow academically well-established and statistically validated psychometric principles. (Ware JE Jr., J Chronic Dis., 40:473-480 (1987); Spilker B., Quality of Life and Pharmacoeconomics in Clinical Trials, 2nd ed. Philadelphia, Pa.: Lippincott-Raven Co; 1995.) One such tool is the SF-36 (Short form-36), which has been widely used in clinical trials and in clinical practice to assess health outcome. (Clancy CM and Eisenberg JM, Science, 282:245-246 (1998)). The SF-36 was derived from the Medical Outcomes Study, which involved 11,336 patients from 523 different clinical sites. (Ware JE, Sherbourne CD, Davies AR. Developing and testing the MOS 20-item short-form health survey. In: Stewart AL and Ware JE, eds., Measuring functioning and well-being: The Medical Outcomes Study approach. Durham, N.C.: University Press, 277-290 (1992); Ware JE. SF-36 Health Survey: manual and interpretation guide. Boston, Mass.: Nimrod Press; 2:1-3:22 (1993)). The validity and reliability of the SF-36 has been proven in several studies in which researchers tested internal consistency, within subject reliability, and differentiation between patient populations. (McHorney CA, et al., Medical Care, 31:247-263 (1993); McHorney CA, et al., Medical Care, 30:S253-S265 (1992); Jenkinson C, et al., Br Med J, 306:1436-1440 (1993); Brazier JE, et al., Br Med J 305:160-164 (1992)). The SF-36 has been shown to predict the course of depression during a two-year study, and to be lower overall in patients who experience chronic health disorders. (Wells KB, et al., Archives General Psychiatry, 49:788-794 (1992); Schlenk EA, et al., Quality of Life Res., 7:57-65 (1998)).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Formulation of flavones and isoflavones for treatment of cellulite**

  Inventor(s): Pugliese, Peter T.; (Berneville, PA)

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  Patent Application Number: 20020106388

  Date filed: November 21, 2001

Abstract: Disclosed is a treatment protocol and formulation for the cosmetic condition known as cellulite. The active ingredients of the several formulation include isoflavones, like genistein, a hydroxyflavone, like **quercetin,** a xanthine derivative, like theophylline, a carnitine, and a plant extract like coleus forskohlii. In the emusion form, standard emulsifiers, emollients, and preservatives are utilized. In the microencapsulated form, the slurry also includes a carrier and preservative, which facilitates a slurry that is used to impregnate body garments, like pantyhose, for extended application to the user's skin.

Excerpt(s): This is an examinable application submitted for an official PTO filing receipt under 35 U.S. Code Section 111(a). This is a continuation-in-part application of my copending provisional application of Nov. 24, 2000, accorded U.S. Ser. No. 60/250,997, same title. This patent application relates to a method and composition for the control and treatment of a cosmetic condition known as cellulite. Treatment is directed at controlling the breakdown of collagen and reducing the fat mass to a smaller volume. As a result, the phtyoestrogens have the capacity to act as either partial estrogen agonists, or antagonists depending on the expression of estrogen receptors subtypes in the cell, and the concentration of the phytoestrogen. Clinically, phytoestrogens may exert tissue specific effects. Phytoestrogens also exhibit both estrogen receptor dependent and independent effects that suggest additional mechanisms beyond receptor binding. Induced differentiation of cancer cells and inhibition of tyrosine kinase are two known effects.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Method and use of extract of a member of Typhaceae's family**

Inventor(s): Zhou, Tong-Shui; (Shanghai, CN)

Correspondence: Raymond Y. Chan; Suite 128; 108 N. Ynez AVE.; Monterey Park; CA; 91754; US

Patent Application Number: 20040018261

Date filed: July 16, 2003

Abstract: An extract of Typhae Pollen which is a traditional Chinese medicine consisting of flavonoids as active components includes at least one member of the group selected from kaempferol, **quercetin** and isorhamnetin and the derivatives of these active components. The present invention also relates to the degraded form of flavonoids, the metal derivatives formed with sodium and potassium salts, and the metal complex formed with a predetermined metal ion. The extract of Typhae Pollen is prepared by a plurality of extraction processes and has a plurality of functions for promoting health including lowering blood lipid level, preventing arteriosclerosis, promoting tolerance of brain and heart tissue under anaerobic condition, preventing blood platelet coagulation, preventing thrombosis and stop bleeding. The extract of Typhae Pollen of the present invention is also used for preventing and treating diseases related to blood vessels in brain and heart, and poor blood circulation induced diseases selecting from the group consisting of chest pain, stomachache, physical injuries, puerperium pain and menstruation.

Excerpt(s): The present invention relates to technology in medical and health science, and more particularly to an extract of a Typhae Pollen and its manufacture and application in medicine and health science. `Typhae Pollen` is a common traditional Chinese medicine, which is generally dried pollen of the family Typhaceae such as

Typha angustifolia L. and Typha orientalis Presl. According to the principles of the tradition Chinese medicine, Typhae Pollen has the properties of stop bleeding, bruise heeling, and enhancing circulation of the lymphatic system and it has been widely used in the treatment of bleeding, apistaxis, hematemesis, external bleeding, painful menstruation, colic, abscess, painful lymphatic system's disease or discomfort. Recent scientific researches envisage that the extracted components of Typhae Pollen by water extraction or alcohol extraction is capable of substantially increasing the coronary blood flow, improving microcirculation, increasing the tolerance ability of brain and cardiac muscle under anaerobic condition, lowering the consumption of oxygen of brain and heart system, promoting blood vessel dilation, lowering the blood lipid level, preventing arteriosclerosis, and acting as anticoagulant. All the different species of Typhae Pollen comprises organic acid, flavonoids, sterol components, long chain aliphatic components and polysaccharides. The principles and applications of these chemical components were only once disclosed in a Chinese patent 1006015 in China wherein the active mechanism and application of lowering blood lipid level of sterol, long chain aliphatic compounds of Typhae Pollen were described. Since then, there is no related arts relating to Typhae Pollen's extract. A main object of the present invention is to provide an extract of Typhae Pollen and a manufacturing method thereof wherein one of the extract components is flavonol glycosides.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Method for preventing or treating elevated blood lipid level-related diseases by administering rutin and quercetin**

  Inventor(s): Bae, Ki-Hwan; (Daejeon, KR), Bok, Song-Hae; (Daejeon, KR), Choi, Myung-Sook; (Daegu, KR), Choi, Yang-Kyu; (Daejeon, KR), Hyun, Byung-Hwa; (Daejeon, KR), Jeong, Tae-Sook; (Daejeon, KR), Kim, Hyo-Soo; (Seoul, KR), Kwon, Yong-Kook; (Daejeon, KR), Lee, Chul-Ho; (Daejeon, KR), Lee, Eun-Sook; (Daejeon, KR), Lee, Sae-Bom; (Daejeon, KR), Moon, Surk-Sik; (Gongju-shi, KR), Park, Yong-Bok; (Daegu, KR), Park, Young-Bae; (Seoul, KR)

  Correspondence: Shahan Islam; Rosenman & Colin Llp; 575 Madison Avenue; New York; NY; 10022; US

  Patent Application Number: 20010014669

  Date filed: March 13, 2001

  Abstract: A method for treating or preventing an elevated blood lipid level-related disease in a mammal, which comprises administering thereto an effective amount of rutin, **quercetin** or a mixture thereof.

  Excerpt(s): The present invention relates to a method for preventing or treating elevated blood lipid level-related diseases such as hyperlipidemia, arteriosclerosis, angina pectoris, stroke and hepatic diseases in mammals, which comprises by administering thereto an effective amount of rutin and/or **quercetin.** It has been reported that blood lipids, especially cholesterols and triglycerides, are closely related to various kind of diseases such as coronary cardio-circulatory diseases, e.g., arteriosclerosis and hypercholesterolemia, and fatty liver. Cholesterol, a fatty steroid alcohol, is a blood lipid produced from saturated fat in the liver. Triglycerides are another type of blood lipids which are known to increase the risk of various diseases. It has also been reported that an elevated blood or plasma cholesterol level causes the deposition of fat, macrophages and foam cells on the wall of blood vessels, such deposit leading to plaque formation and then to arteriosclerosis(see Ross, R., Nature, 362, 801-809(1993)). One of the methods

for decreasing the plasma cholesterol level is alimentotherapy to reduce the ingestion of cholesterol and lipids. Another method is to inhibit the absorption of cholesterol by inhibiting enzymes involved therein. Acyl CoA-cholesterol-o-acyltransferase(ACAT) promotes the esterification of cholesterol in blood. Foam cells are formed by the action of ACAT and contain a large amount of cholesterol ester carried by low density lipoproteins. The formation of foam cells on the wall of artery increases with the ACAT activity, and, accordingly, an inhibitor of ACAT may also be an agent for preventing arteriosclerosis. Further, it has been reported that the blood level of LDL-cholesterol can be reduced by inhibiting the ACAT activity(see Witiak, D. T. and D. R. Feller(eds.), Anti-Lipidemic Drugs: Medicinal, Chemical and Biochemical Aspects, Elsevier, pp159-195 (1991)).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Method of treating interleukin-6-mediated inflammatory diseases**

  Inventor(s): Theoharides, Theoharis C.; (Brookline, MA)

  Correspondence: Law Offices OF DR. Melvin Blecher; 4329 Van Ness ST., NW; Washington; DC; 20016-5625; US

  Patent Application Number: 20030229030

  Date filed: June 11, 2002

  Abstract: The invention is a method of treating IL-6-mediated inflammatory diseases with flavonoid inhibitors of the production and secretion of IL-6 from human or animal mast or macrophage cells. The most effective flavonoid compounds include **quercetin,** kaempferol, myricetin and genistein, and these can be administered alone or in combination with S-adenosylmethionine, folic acid, interleukin-10 or a histamine-1 receptor antagonist such as azelastine.

  Excerpt(s): The field of the invention is cytokine interleukin-6 (IL-6)-mediated inflammatory diseases in humans and animals. More specifically, the invention relates to the use of certain flavonoid compounds and histamine-1 receptor antagonists for treating inflammatory diseases mediated by IL-6. IL-6, a multifunctional cytokine, is rapidly elevated in the circulation during inflammatory, physiological or psychological stress, and is also associated with osteoporosis (Papanicolau, D., et al., Arch Int Med 128: 127 (1998)). IL-6 has been strongly implicated in the genesis of autoimmune disorders, plasma cell neoplasias, inflammatory processes of the skin (including scleroderma, psoriasis and delayed pressure urticaria, rheumatoid arthritis juvenile chronic arthritis, coronary artery disease (CAD) with or without atherosclerosis, interstitial cystitis, and congestive heart failure. Inflammation and IL-6 are specifically now thought to link to heart attacks (Taubes, G., Science 296: 242 (2002)). Inflammation can occur in response to external (e.g., infection) or internal (e.g., cancer) factors and involves many cell types, primarily immune cells, including macrophages. Mast cells have been increasingly implicated in inflammatory processes where degranulation, as commonly seen in allergic reactions, is not observed (Theoharides, T C, J Clin Psychopharmacol. 22:103 (2002). Serotonin secreted from rat mast cells without exocytosis provided the first indication of differential release, but the physiological stimuli for such process remain unknown.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Methods and compositions for inhibiting the proliferation of prostate cancer cells**

  Inventor(s): XING, NIANZENG; (ROCHESTER, MN), Young, Charles; (Rochester, MN)

  Correspondence: Fish & Richardson P.C.; 3300 Dain Rascher Plaza; 60 South Sixth Street; Minneapolis; MN; 55402; US

  Patent Application Number: 20030054357

  Date filed: September 20, 2001

  Abstract: The invention provides for methods of monitoring the proliferation of cultured prostate cancer cells in the presence of **quercetin,** methods of treating an individual with prostate cancer or at risk of developing prostate cancer, and methods of reducing the risk of recurrence of prostate cancer in an individual who had previously been treated for prostate cancer. Methods of the invention further include treating an individual with benign prostatic hyperplasia (BPH) with **quercetin** as well as methods of screening for compounds that inhibit the proliferation of prostate cancer cells. The invention provides for compositions and articles of manufacture containing **quercetin** in particular formulations, and **quercetin** with a second compound that also exerts an effect on the androgen receptor.

  Excerpt(s): This invention relates to prostate cancer, and more particularly to methods and compositions for inhibiting the proliferation of prostate cancer cells. The prostate gland is located between the bladder and the rectum and wraps around the urethra. The prostate is composed of glandular tissue that produces a milky fluid and smooth muscles that contract during sex and squeeze this fluid into the urethra where it mixes with other fluid and sperm to form semen. The prostate gland converts testosterone to a more powerful male hormone, dihydrotestosterone, which affects the size of the gland and plays an important role in prostate cancer. Prostate cancer is a malignant tumor that arises in the prostate gland and can eventually spread through the blood and lymph fluid to other organs, bones, and tissues. Prostate cancer is the most commonly diagnosed cancer in the U.S., and it is the second leading cause of cancer death in American men after non-melanoma skin cancer. Although prostate cancer is just as common in Japan as in the United States, death rates from prostate cancer are significantly lower in Japan. It is unlikely that these differences are all genetic, because Japanese men who migrate to the United States die of prostate cancer with increasing frequency as a function of the number of years they reside in the United States. It is possible that this paradox could be explained, at least in part, by dietary factors.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **New method for producing antioxidant and prevention of cancer**

  Inventor(s): Liu, Yaguang; (Flushing, NY)

  Correspondence: Yaguang Liu; 67-08 168th Street; Flushing; NY; 11365; US

  Patent Application Number: 20030175372

  Date filed: March 8, 2002

  Excerpt(s): A pharmaceutical composition for prevention and treatment of cancer, cardiovascular disease and antioxidation contains resveratol. The new method of process for producing resveratol is extracted resveratol from oil residue and stems of peanuts or stems of other cheap herbs. It has demonstrated that resveratol (RES) and its derivatives shown remarkably preventing effect on the development of cancer and

cardiovascular disease. But natural source of extracting resveratol is limited in seed and skin of grapes so far. Therefore, the price of resveratol is expensive. We also found that resveratol is a very strong antioxidant. In fact, disorder of anti-oxidation and peroxidation will cause cardiovascular disease, cancer, alzheimer and other diseases. For example, oxidation of lower density lipoprotein (LDL) is very important in heart disease. Over oxidized LDL involves plaques and clot formation and ischemia occurs in development of atherosclerosis. The results are that more oxidative injury caused in the vascular endothelium.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Ophthalmic, pharmaceutical and other healthcare preparations with naturally occurring plant compounds, extracts and derivatives**

  Inventor(s): Bruijn, Chris De; (Ahaus, DE), Christ, F. Richard; (Laguna Beach, CA), Dziabo, Anthony J.; (Lake Forest, CA), Vigh, Joseph; (Placentia, CA)

  Correspondence: Crosby Heafey Roach & May; 1901 Avenue OF The Stars, Suite 700; Los Angeles; CA; 90067; US

  Patent Application Number: 20030086986

  Date filed: April 4, 2002

  Abstract: A number of discrete, isolated and well-characterized natural plant compounds show antimicrobial activity when used for topical applications in the ophthalmic, skin care, oral care, pharmaceutical, medical device, heath care products or similar preparations for topical application. Of particular interest are Allantoin, Berberine, Bilberry extract, Caffeic Acid Phenethyl Ether, Chlorogenic Acid, Cranberry Extract, Elderberry Extract, Ferulic Acid, Green Tea Extract, Grape Seed Extract, Hydroxytyrosol, Oleuropein, Olive Leaf Extract, Pine Bark Extract, Pomegranate Extract, Pycnogenol, **Quercetin,** Resveratrol, and Tart Cherry Extract. Oleuropein, and Pomegranate Extract, either alone or in combination, is extremely effective. Allantoin, can be used to enhance the efficacy of synthetic chemical disinfecting/preservative agents as well as to mitigate the cytotoxicity of some synthetic chemical disinfecting/preservative agents.

  Excerpt(s): The present application is a Continuation In Part of Ser. No. 09/711,784, filed on Nov. 13, 2000, which is a Continuation of Ser. No. 09/130,542, filed on Aug. 4, 1998 and now issued as U.S. Pat. No. 6,162,393 all of which are incorporated herein by reference. The present invention relates to the use of natural plant compounds, extracts and derivatives alone or in combination or with other chemical antimicrobial agents to preserve ophthalmic, skin care, oral care, pharmaceutical and other healthcare preparations and methods to disinfect soft and rigid gas permeable (RGP) contact lenses. Ophthalmic, oral care, skin care solutions, emulsions, ointments, gels, creams and many other pharmaceutical and healthcare preparations for topical application (e.g., artificial tears, skin creams, mouthwashes, therapeutics, contact lens care products, anti-allergenic, anti-puretics, etc.) must be preserved to prevent biological contamination and degradation. By "preparation for topical application" we mean any cream or solution or other physical form that is applied to the skin, eyes or externally accessible mucous membranes such as preparation inserted into various body orifices. It is now acceptable practice to add chemical preservatives to such preparations to ensure preservation of said preparations. These chemical preservatives (e.g., Benzalkonium Chloride, polyhexamethyl biguanide [PHMB], Chlorhexadine, Thimerosol, sorbic acid, etc.) are often harsh, synthetic cytotoxic agents, which can irritate and possibly damage sensitive

tissues. The same issue applies to any other pharmaceutical and healthcare preparations, which require preservative to prevent biological contamination and degradation.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Polyphenolics for enhancing endothelial cell-mediated fibrinolysis**

  Inventor(s): Aikens, Michael L.; (Birmingham, AL), Benza, Raymond L.; (Birmingham, AL), Booyse, Francois M.; (Birmingham, AL)

  Correspondence: Glenna Hendricks, ESQ.; P.O. Box 2509; Fairfax; VA; 22031-2509; US

  Patent Application Number: 20020146424

  Date filed: February 20, 2002

  Abstract: This invention to provides means of achieving cardiovascular protective effects by administration of fibrinolytic activity increasing amounts of catechin, epicatechin, **quercetin** and/or resveratrol or their complexes individually or in combination without administration of ethanol.

  Excerpt(s): This application takes priority for U.S. Provisional Patent Application No. 60/269,351, filed Feb. 20, 2001. This invention relates to use of polyphenols, including metabolically or synthetically modified forms, to promote systemic fibrinolysis in the prevention/regression and treatment of atherogenesis and its atherothrombotic consequences, including myocardial infarction, unstable angina, claudication, acute limb ischemia and thrombotic cerebrovascular events. Previous studies suggest that the moderate consumption of red wine is associated with lower coronary heart disease (CHD) related mortality. Even though the mechanism by which the cardioprotection occurs has not been fully elucidated, this reduction in cardiovascular mortality is believed to be, in part, due to components found in red wine. Low ethanol levels have been shown to have various effects on vascular endothelial cell (EC) mediated fibrinolysis. ECs play a key role in maintenance of hemostasis by synthesis/regulation of plasminogen activators (PAs), tissue type-PA (t-PA) and urokinase type-PA (u-PA) and their respective receptors. These fibrinolytic proteins interact to localize and regulate fibrinolysis on the EC surface. Therefore, systemic factors that will affect EC PAs and/or receptors and increase fibrinolysis may reduce the risk for thrombosis, CHD and myocardial infarction (MI).

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Unit dosage forms for the treatment of herpes simplex**

  Inventor(s): Pearson, Don C.; (Lakewood, WA), Richardson, Kenneth T.; (Anchorage, AK)

  Correspondence: Townsend And Townsend And Crew; Two Embarcadero Center; Eighth Floor; San Francisco; CA; 94111-3834; US

  Patent Application Number: 20010031737

  Date filed: April 5, 2001

  Abstract: The components of this invention are chosen because of their complementarity for the prevention or treatment of diseases caused by the herpes simplex virus. L-Lysine favorably increases the physiologic immunomodulation necessary for defense against this virus. Zinc improves and maintains a normal immune response. 2-Deoxy-2-D-

glucose and heparin sodium alter the surface interaction between the herpes virus and the cell, preventing fusion and infectivity. N-Acetyl-L-cysteine increases glutathione levels thereby creating a thiol redox barrier to the virus at the cell membrane. **Quercetin** reduces intracellular replication of the herpes virus and viral infectivity. Ascorbate, in concert with copper and D-.alpha.-tocopherol, provides an antioxidant defense against the herpes virus, which tends to lose latency during period of oxidative, free radical excess. Selenium and **quercetin** also participate in reducing various oxidative stresses. Together the components of this invention provide the potential for improved resistance to, improved recovery from, and a decreased frequency of recurrence of herpes simplex virus infection.

Excerpt(s): This application is related to U.S. Provisional Patent Application No. 60/101,308, filed Sep. 21, 1998, and claims all benefits legally available therefrom. Provisional Patent Application No. 60/101,308 is hereby incorporated by reference for all purposes capable of being served thereby. This invention is in the field of pharmacology, and relates specifically to the pharmacological treatment of conditions associated with herpes simplex virus infections. No human virus is considered normal flora; although some viruses may be more or less symptomatic, unlike bacteria none can be considered non-pathogenic. And because the viral life cycle is played out within a host cell, the membrane and molecular function of the target eukaryocyte and the biological life cycle of the invasive virion are inextricably entwined.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Use of natural EGFR inhibitors to prevent dermatitis, such as due to cleansers**

  Inventor(s): Fisher, Gary J.; (Ypsilanti, MI), Kang, Sewon; (Ann Arbor, MI), Voorhees, John J.; (Ann Arbor, MI)

  Correspondence: Bradley N. Ruben, PC; Suite 5A; 463 First ST.; Hoboken; NJ; 07030; US

  Patent Application Number: 20040033207

  Date filed: August 12, 2003

  Abstract: People's hands undergo daily exposure to hot, cold, and chemicals (such as cleansers). These exposures can cause dermatitis due to activation of the Epidermal Growth Factor Receptor (EGFR). One effect of activation of the EGFR is hyperproliferation of skin cells, which presents as rough, dry, and/or peeling hands, generally known as dermatitis. The use of a natural EGFR inhibitor, such as genistein or **quercetin,** can help to treat or prevent these kinds of dermatitis.

  Excerpt(s): This application is a divisional of application Ser. No. 10/085,978, filed Feb. 27, 2002, which is on prior provisional application No. 60/271,894, filed Feb. 27, 2001, the disclosures of which are both incorporated herein by reference. This invention relates to the use of EGF receptor inhibitors, especially those occuring naturally in produce, foodstuffs, and the like, such as the isoflavinoid genistein, for preventing unwanted side effects when retinoids are used topically for treating humans. Topical retinoid administration has been used to treat a wide variety of dermatological ailments. For example, acne vulgaris has been treated with all-trans retinoic acid (tretinoin), sold under the well-known brand name Retin-A (from Janssen Pharmaceuticals), and the lesser known brand name Avita (from Penederm); oral 13-cis retinoic acid (isotretinoin; sold under the brand name Accutane for oral administration) has been used for severe cases of acne. 9-cis retinoic acid (alitretinoin) has been used topically to treat cutaneous lesions of AIDS-related Kaposi's sarcoma (Panretin brand gel, from Ligand

Pharmaceuticals), and systemically to treat chronic eczema and renal cancer. Synthetic retinoids that have been approved for use against acne and psoriasis include adapalene (sold under the brand Differin) and tazarotene (sold under the brand name Tazorac), respectively. Psoriasis also has been treated with the trimethylmethoxyphenyl analogue of retinoic acid ethyl ester (etretinate; sold under the brand names Soriatane (acetretin), and formerly Tegison (etretinate)). Retinoids have also been used for treating other kinds of acne (such as cystic acne and acne rosacea) and various keratinization disorders (such as, ichthyoses (such as lamellar ichthyosis, ichthyosis vulgaris), pityriasis rubra pilaris, and Darier's disease). Retinoids have also been used for skin cancer and chemotheraphy of precancerous lesions and chemoprophylaxis (such as for basal cell and squamous cell carcinomas and keratoacanthoma). Retinoids have also been used for treating such skin conditions as warts, hyperkaratotic eczema of the hands and feet, and cutaneous sarcoidosis. In addition, retinoids have been used for treating photoaged skin, with compositions such as sold under the brand name Renova. Thus, retinoids are widely used both topically and systemically (orally) for a wide variety of conditions.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Utilization of achyrocline satureoides ("Marcela") extracts and liposomal preparations of natural and semi-synthetic flavonoids for the prevention and treatment of the consequences of stroke and neurodegenerative diseases**

  Inventor(s): Dajas, Federico; (Montevideo, UY), Heinzen, Horacio; (Montevideo, UY)

  Correspondence: Needle & Rosenberg, P.C.; The Candler Building; Suite 1200; 127 Peachtree Street, N.E.; Atlanta; GA; 30303-1811; US

  Patent Application Number: 20030055103

  Date filed: July 3, 2002

  Abstract: Discovery of a neuroprotective effect in vivo of Achyrocline satureoides ("Marcela") extracts and of liposomal preparations of natural and semi-synthetic flavonoids structurally related to **quercetin.** This effect is obtained mainly through antiapoptotic mechanisms, complementary and different of the antioxidant actions of flavonoids. The compounds will be beneficial for the prevention and treatment of stroke and neurodegenerative and aging brain lesions. These benefits will be obtained by the administration of compositions comprising one or various compounds of general formula 1. The liposomal preparation of these compounds increases neuroprotection and will be the preferred application. 1

  Excerpt(s): This application claims priority to Uruguayan Patent Application No. 26.816, filed on Jul. 4, 2001, which is herein incorporated by this reference in its entirety. The invention relates to methods of treating and/or preventing vascular or neurodegenerative brain diseases. Vascular and neurodegenerative brain diseases are the most frequent causes of death and morbidity of neurologic origin. With 8% of total deaths and a general incidence of around 2/1000, cerebral pathology is very important because of its high morbidity, the deep affectation of quality of life they provoke and the burden of high socio-economic costs (Reitsma et al. 1998; Kolominsky-Rabas et al. 1998; Samsa et al. 1999; Leppl et al. 1999). In spite of this situation, there is no specific treatment for neuronal death.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

Keeping Current

In order to stay informed about patents and patent applications dealing with quercetin, you can access the U.S. Patent Office archive via the Internet at the following Web address: **http://www.uspto.gov/patft/index.html**. You will see two broad options: (1) Issued Patent, and (2) Published Applications. To see a list of issued patents, perform the following steps: Under "Issued Patents," click "Quick Search." Then, type "quercetin" (or synonyms) into the "Term 1" box. After clicking on the search button, scroll down to see the various patents which have been granted to date on quercetin.

You can also use this procedure to view pending patent applications concerning quercetin. Simply go back to **http://www.uspto.gov/patft/index.html**. Select "Quick Search" under "Published Applications." Then proceed with the steps listed above.

CHAPTER 6. PERIODICALS AND NEWS ON QUERCETIN

Overview

In this chapter, we suggest a number of news sources and present various periodicals that cover quercetin.

News Services and Press Releases

One of the simplest ways of tracking press releases on quercetin is to search the news wires. In the following sample of sources, we will briefly describe how to access each service. These services only post recent news intended for public viewing.

PR Newswire

To access the PR Newswire archive, simply go to **http://www.prnewswire.com/**. Select your country. Type "quercetin" (or synonyms) into the search box. You will automatically receive information on relevant news releases posted within the last 30 days. The search results are shown by order of relevance.

Reuters Health

The Reuters' Medical News and Health eLine databases can be very useful in exploring news archives relating to quercetin. While some of the listed articles are free to view, others are available for purchase for a nominal fee. To access this archive, go to **http://www.reutershealth.com/en/index.html** and search by "quercetin" (or synonyms). The following was recently listed in this archive for quercetin:

- **Quercetin alleviates symptoms of nonbacterial chronic prostatitis**
  Source: Reuters Medical News
  Date: January 17, 2000

The NIH

Within MEDLINEplus, the NIH has made an agreement with the New York Times Syndicate, the AP News Service, and Reuters to deliver news that can be browsed by the public. Search news releases at **http://www.nlm.nih.gov/medlineplus/alphanews_a.html**. MEDLINEplus allows you to browse across an alphabetical index. Or you can search by date at the following Web page: **http://www.nlm.nih.gov/medlineplus/newsbydate.html**. Often, news items are indexed by MEDLINEplus within its search engine.

Business Wire

Business Wire is similar to PR Newswire. To access this archive, simply go to **http://www.businesswire.com/**. You can scan the news by industry category or company name.

Market Wire

Market Wire is more focused on technology than the other wires. To browse the latest press releases by topic, such as alternative medicine, biotechnology, fitness, healthcare, legal, nutrition, and pharmaceuticals, access Market Wire's Medical/Health channel at **http://www.marketwire.com/mw/release_index?channel=MedicalHealth**. Or simply go to Market Wire's home page at **http://www.marketwire.com/mw/home**, type "quercetin" (or synonyms) into the search box, and click on "Search News." As this service is technology oriented, you may wish to use it when searching for press releases covering diagnostic procedures or tests.

Search Engines

Medical news is also available in the news sections of commercial Internet search engines. See the health news page at Yahoo (**http://dir.yahoo.com/Health/News_and_Media/**), or you can use this Web site's general news search page at **http://news.yahoo.com/**. Type in "quercetin" (or synonyms). If you know the name of a company that is relevant to quercetin, you can go to any stock trading Web site (such as **http://www.etrade.com/**) and search for the company name there. News items across various news sources are reported on indicated hyperlinks. Google offers a similar service at **http://news.google.com/**.

BBC

Covering news from a more European perspective, the British Broadcasting Corporation (BBC) allows the public free access to their news archive located at **http://www.bbc.co.uk/**. Search by "quercetin" (or synonyms).

Academic Periodicals covering Quercetin

Numerous periodicals are currently indexed within the National Library of Medicine's PubMed database that are known to publish articles relating to quercetin. In addition to

these sources, you can search for articles covering quercetin that have been published by any of the periodicals listed in previous chapters. To find the latest studies published, go to **http://www.ncbi.nlm.nih.gov/pubmed**, type the name of the periodical into the search box, and click "Go."

If you want complete details about the historical contents of a journal, you can also visit the following Web site: **http://www.ncbi.nlm.nih.gov/entrez/jrbrowser.cgi**. Here, type in the name of the journal or its abbreviation, and you will receive an index of published articles. At **http://locatorplus.gov/**, you can retrieve more indexing information on medical periodicals (e.g. the name of the publisher). Select the button "Search LOCATORplus." Then type in the name of the journal and select the advanced search option "Journal Title Search."

APPENDICES

APPENDIX A. PHYSICIAN RESOURCES

Overview

In this chapter, we focus on databases and Internet-based guidelines and information resources created or written for a professional audience.

NIH Guidelines

Commonly referred to as "clinical" or "professional" guidelines, the National Institutes of Health publish physician guidelines for the most common diseases. Publications are available at the following by relevant Institute[11]:

- Office of the Director (OD); guidelines consolidated across agencies available at **http://www.nih.gov/health/consumer/conkey.htm**
- National Institute of General Medical Sciences (NIGMS); fact sheets available at **http://www.nigms.nih.gov/news/facts/**
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines: **http://www.nlm.nih.gov/medlineplus/healthtopics.html**
- National Cancer Institute (NCI); guidelines available at **http://www.cancer.gov/cancerinfo/list.aspx?viewid=5f35036e-5497-4d86-8c2c-714a9f7c8d25**
- National Eye Institute (NEI); guidelines available at **http://www.nei.nih.gov/order/index.htm**
- National Heart, Lung, and Blood Institute (NHLBI); guidelines available at **http://www.nhlbi.nih.gov/guidelines/index.htm**
- National Human Genome Research Institute (NHGRI); research available at **http://www.genome.gov/page.cfm?pageID=10000375**
- National Institute on Aging (NIA); guidelines available at **http://www.nia.nih.gov/health/**

[11] These publications are typically written by one or more of the various NIH Institutes.

- National Institute on Alcohol Abuse and Alcoholism (NIAAA); guidelines available at **http://www.niaaa.nih.gov/publications/publications.htm**
- National Institute of Allergy and Infectious Diseases (NIAID); guidelines available at **http://www.niaid.nih.gov/publications/**
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS); fact sheets and guidelines available at **http://www.niams.nih.gov/hi/index.htm**
- National Institute of Child Health and Human Development (NICHD); guidelines available at **http://www.nichd.nih.gov/publications/pubskey.cfm**
- National Institute on Deafness and Other Communication Disorders (NIDCD); fact sheets and guidelines at **http://www.nidcd.nih.gov/health/**
- National Institute of Dental and Craniofacial Research (NIDCR); guidelines available at **http://www.nidr.nih.gov/health/**
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK); guidelines available at **http://www.niddk.nih.gov/health/health.htm**
- National Institute on Drug Abuse (NIDA); guidelines available at **http://www.nida.nih.gov/DrugAbuse.html**
- National Institute of Environmental Health Sciences (NIEHS); environmental health information available at **http://www.niehs.nih.gov/external/facts.htm**
- National Institute of Mental Health (NIMH); guidelines available at **http://www.nimh.nih.gov/practitioners/index.cfm**
- National Institute of Neurological Disorders and Stroke (NINDS); neurological disorder information pages available at **http://www.ninds.nih.gov/health_and_medical/disorder_index.htm**
- National Institute of Nursing Research (NINR); publications on selected illnesses at **http://www.nih.gov/ninr/news-info/publications.html**
- National Institute of Biomedical Imaging and Bioengineering; general information at **http://grants.nih.gov/grants/becon/becon_info.htm**
- Center for Information Technology (CIT); referrals to other agencies based on keyword searches available at **http://kb.nih.gov/www_query_main.asp**
- National Center for Complementary and Alternative Medicine (NCCAM); health information available at **http://nccam.nih.gov/health/**
- National Center for Research Resources (NCRR); various information directories available at **http://www.ncrr.nih.gov/publications.asp**
- Office of Rare Diseases; various fact sheets available at **http://rarediseases.info.nih.gov/html/resources/rep_pubs.html**
- Centers for Disease Control and Prevention; various fact sheets on infectious diseases available at **http://www.cdc.gov/publications.htm**

NIH Databases

In addition to the various Institutes of Health that publish professional guidelines, the NIH has designed a number of databases for professionals.[12] Physician-oriented resources provide a wide variety of information related to the biomedical and health sciences, both past and present. The format of these resources varies. Searchable databases, bibliographic citations, full-text articles (when available), archival collections, and images are all available. The following are referenced by the National Library of Medicine:[13]

- **Bioethics:** Access to published literature on the ethical, legal, and public policy issues surrounding healthcare and biomedical research. This information is provided in conjunction with the Kennedy Institute of Ethics located at Georgetown University, Washington, D.C.: **http://www.nlm.nih.gov/databases/databases_bioethics.html**
- **HIV/AIDS Resources:** Describes various links and databases dedicated to HIV/AIDS research: **http://www.nlm.nih.gov/pubs/factsheets/aidsinfs.html**
- **NLM Online Exhibitions:** Describes "Exhibitions in the History of Medicine": **http://www.nlm.nih.gov/exhibition/exhibition.html**. Additional resources for historical scholarship in medicine: **http://www.nlm.nih.gov/hmd/hmd.html**
- **Biotechnology Information:** Access to public databases. The National Center for Biotechnology Information conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information for the better understanding of molecular processes affecting human health and disease: **http://www.ncbi.nlm.nih.gov/**
- **Population Information:** The National Library of Medicine provides access to worldwide coverage of population, family planning, and related health issues, including family planning technology and programs, fertility, and population law and policy: **http://www.nlm.nih.gov/databases/databases_population.html**
- **Cancer Information:** Access to cancer-oriented databases: **http://www.nlm.nih.gov/databases/databases_cancer.html**
- **Profiles in Science:** Offering the archival collections of prominent twentieth-century biomedical scientists to the public through modern digital technology: **http://www.profiles.nlm.nih.gov/**
- **Chemical Information:** Provides links to various chemical databases and references: **http://sis.nlm.nih.gov/Chem/ChemMain.html**
- **Clinical Alerts:** Reports the release of findings from the NIH-funded clinical trials where such release could significantly affect morbidity and mortality: **http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html**
- **Space Life Sciences:** Provides links and information to space-based research (including NASA): **http://www.nlm.nih.gov/databases/databases_space.html**
- **MEDLINE:** Bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the healthcare system, and the pre-clinical sciences: **http://www.nlm.nih.gov/databases/databases_medline.html**

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[12] Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINE*plus* (**http://medlineplus.gov/** or **http://www.nlm.nih.gov/medlineplus/databases.html**).

[13] See **http://www.nlm.nih.gov/databases/databases.html**.

- **Toxicology and Environmental Health Information (TOXNET):** Databases covering toxicology and environmental health: **http://sis.nlm.nih.gov/Tox/ToxMain.html**
- **Visible Human Interface:** Anatomically detailed, three-dimensional representations of normal male and female human bodies: **http://www.nlm.nih.gov/research/visible/visible_human.html**

The NLM Gateway[14]

The NLM (National Library of Medicine) Gateway is a Web-based system that lets users search simultaneously in multiple retrieval systems at the U.S. National Library of Medicine (NLM). It allows users of NLM services to initiate searches from one Web interface, providing one-stop searching for many of NLM's information resources or databases.[15] To use the NLM Gateway, simply go to the search site at **http://gateway.nlm.nih.gov/gw/Cmd**. Type "quercetin" (or synonyms) into the search box and click "Search." The results will be presented in a tabular form, indicating the number of references in each database category.

Results Summary

Category	Items Found
Journal Articles	4528
Books / Periodicals / Audio Visual	2
Consumer Health	547
Meeting Abstracts	3
Other Collections	5
Total	5085

HSTAT[16]

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.[17] These documents include clinical practice guidelines, quick-reference guides for clinicians, consumer health brochures, evidence reports and technology assessments from the Agency for Healthcare Research and Quality (AHRQ), as well as AHRQ's Put Prevention Into Practice.[18] Simply search by "quercetin" (or synonyms) at the following Web site: **http://text.nlm.nih.gov**.

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[14] Adapted from NLM: **http://gateway.nlm.nih.gov/gw/Cmd?Overview.x**.

[15] The NLM Gateway is currently being developed by the Lister Hill National Center for Biomedical Communications (LHNCBC) at the National Library of Medicine (NLM) of the National Institutes of Health (NIH).

[16] Adapted from HSTAT: **http://www.nlm.nih.gov/pubs/factsheets/hstat.html**.

[17] The HSTAT URL is **http://hstat.nlm.nih.gov/**.

[18] Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's *Guide to Clinical Preventive Services*; the independent, nonfederal Task Force on Community Services' *Guide to Community Preventive Services*; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.

Coffee Break: Tutorials for Biologists[19]

Coffee Break is a general healthcare site that takes a scientific view of the news and covers recent breakthroughs in biology that may one day assist physicians in developing treatments. Here you will find a collection of short reports on recent biological discoveries. Each report incorporates interactive tutorials that demonstrate how bioinformatics tools are used as a part of the research process. Currently, all Coffee Breaks are written by NCBI staff.[20] Each report is about 400 words and is usually based on a discovery reported in one or more articles from recently published, peer-reviewed literature.[21] This site has new articles every few weeks, so it can be considered an online magazine of sorts. It is intended for general background information. You can access the Coffee Break Web site at the following hyperlink: **http://www.ncbi.nlm.nih.gov/Coffeebreak/**.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are some examples that may interest you:

- **CliniWeb International:** Index and table of contents to selected clinical information on the Internet; see **http://www.ohsu.edu/cliniweb/**.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see **http://www.mwsearch.com/**.

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[19] Adapted from **http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html**.

[20] The figure that accompanies each article is frequently supplied by an expert external to NCBI, in which case the source of the figure is cited. The result is an interactive tutorial that tells a biological story.

[21] After a brief introduction that sets the work described into a broader context, the report focuses on how a molecular understanding can provide explanations of observed biology and lead to therapies for diseases. Each vignette is accompanied by a figure and hypertext links that lead to a series of pages that interactively show how NCBI tools and resources are used in the research process.

APPENDIX B. PATIENT RESOURCES

Overview

Official agencies, as well as federally funded institutions supported by national grants, frequently publish a variety of guidelines written with the patient in mind. These are typically called "Fact Sheets" or "Guidelines." They can take the form of a brochure, information kit, pamphlet, or flyer. Often they are only a few pages in length. Since new guidelines on quercetin can appear at any moment and be published by a number of sources, the best approach to finding guidelines is to systematically scan the Internet-based services that post them.

Patient Guideline Sources

The remainder of this chapter directs you to sources which either publish or can help you find additional guidelines on topics related to quercetin. Due to space limitations, these sources are listed in a concise manner. Do not hesitate to consult the following sources by either using the Internet hyperlink provided, or, in cases where the contact information is provided, contacting the publisher or author directly.

The National Institutes of Health

The NIH gateway to patients is located at **http://health.nih.gov/**. From this site, you can search across various sources and institutes, a number of which are summarized below.

Topic Pages: MEDLINEplus

The National Library of Medicine has created a vast and patient-oriented healthcare information portal called MEDLINEplus. Within this Internet-based system are "health topic pages" which list links to available materials relevant to quercetin. To access this system, log on to **http://www.nlm.nih.gov/medlineplus/healthtopics.html**. From there you can either search using the alphabetical index or browse by broad topic areas. Recently, MEDLINEplus listed the following when searched for "quercetin":

Chronic Fatigue Syndrome
http://www.nlm.nih.gov/medlineplus/chronicfatiguesyndrome.html

Diabetes
http://www.nlm.nih.gov/medlineplus/diabetes.html

Weight Loss Surgery
http://www.nlm.nih.gov/medlineplus/weightlosssurgery.html

You may also choose to use the search utility provided by MEDLINEplus at the following Web address: **http://www.nlm.nih.gov/medlineplus/**. Simply type a keyword into the search box and click "Search." This utility is similar to the NIH search utility, with the exception that it only includes materials that are linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The Combined Health Information Database (CHID)

CHID Online is a reference tool that maintains a database directory of thousands of journal articles and patient education guidelines on quercetin. CHID offers summaries that describe the guidelines available, including contact information and pricing. CHID's general Web site is **http://chid.nih.gov/**. To search this database, go to **http://chid.nih.gov/detail/detail.html**. In particular, you can use the advanced search options to look up pamphlets, reports, brochures, and information kits. The following was recently posted in this archive:

- **Information About Prostate Pain Relief**

  Source: Encino, CA: Institute for Male Urology. 2001. 2 p.

  Contact: Available from Institute for Male Urology. 16500 Ventura Boulevard, Suite 409, Encino, CA 91436. (888) 724-1113. Website: www.urol.com. PRICE: Single copy free.

  Summary: This brochure offers information on prostate pain relief for men who have one or more of the symptoms of chronic, nonbacterial prostatitis, a painful and frustrating inflammation of the prostate gland that can affect men of all ages. The brochure describes the use of Prosta-Q, a proprietary, patent-pending formulation of the bioflavonoid **quercetin,** found in red wine, onions, green tea, and other natural substances. Prosta-Q is available in drug stores without a prescription. The brochure also discusses other treatments for chronic prostatitis, including antibiotics, alpha blockers, nonsteroidal antiinflammatory drugs (NSAIDs), and dietary changes. One chart summarizes the symptoms of the three types of prostatitis: acute bacterial, chronic bacterial, and chronic nonbacterial prostatitis. Another chart summarizes prostate health facts. The brochure briefly describes the work of the Institute for Male Urology (IMU, www.urol.com). 1 figure. 1 table.

- **Interstitial Cystitis and Over-the-Counter Products and Medications**

  Source: Rockville, MD: Interstitial Cystitis Association (ICA). 2003. 2 p.

  Contact: Available from Interstitial Cystitis Association (ICA). 110 N. Washington Street, Suite 340, Rockville, MD 20850. (301) 610-5300. Fax (301) 610-5308. E-mail: ICAmail@ichelp.org. Website: www.ichelp.org. PRICE: Full-text available online at no charge.

Summary: This fact sheet considers the several over-the-counter (OTC) products and medications currently available that may be useful for interstitial cystitis (IC). Products are organized into four sections: to help reduce bladder symptoms, reduced acid foods and beverages, to help with sexual intimacy, and other helpful products. In the first section, the fact sheet briefly describes Prelief (dietary supplement), aloe vera, Cysta-Q and Prosta-Q (bioflavenoids), traditional Chinese herbal remedies, Algonot-Plus (glucosamine, chondroitin, and **quercetin** combination), and Tamer (natural supplements containing calcium carbonate, potassium and magnesium hydroxides). The second section includes Cafix (a coffee substitute), acid reduced coffees and teas, acid-reduced orange juice, Puroast coffee (lower acid coffee), and Natural Touch Roma (a multigrain beverage). The fact sheet includes the contact information for the ICA (www.ichelp.org).

The National Guideline Clearinghouse™

The National Guideline Clearinghouse™ offers hundreds of evidence-based clinical practice guidelines published in the United States and other countries. You can search this site located at **http://www.guideline.gov/** by using the keyword "quercetin" (or synonyms). The following was recently posted:

- **2002 national guideline for the management of prostatitis**

  Source: Association for Genitourinary Medicine - Medical Specialty Society; 1999 August (revised 2002); Various pagings

  http://www.guideline.gov/summary/summary.aspx?doc_id=3041&nbr=2267&string=Quercetin

The NIH Search Utility

The NIH search utility allows you to search for documents on over 100 selected Web sites that comprise the NIH-WEB-SPACE. Each of these servers is "crawled" and indexed on an ongoing basis. Your search will produce a list of various documents, all of which will relate in some way to quercetin. The drawbacks of this approach are that the information is not organized by theme and that the references are often a mix of information for professionals and patients. Nevertheless, a large number of the listed Web sites provide useful background information. We can only recommend this route, therefore, for relatively rare or specific disorders, or when using highly targeted searches. To use the NIH search utility, visit the following Web page: **http://search.nih.gov/index.html**.

Additional Web Sources

A number of Web sites are available to the public that often link to government sites. These can also point you in the direction of essential information. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=168&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/specific.htm**
- Google: **http://directory.google.com/Top/Health/Conditions_and_Diseases/**

- Med Help International: **http://www.medhelp.org/HealthTopics/A.html**
- Open Directory Project: **http://dmoz.org/Health/Conditions_and_Diseases/**
- Yahoo.com: **http://dir.yahoo.com/Health/Diseases_and_Conditions/**
- WebMD®Health: **http://my.webmd.com/health_topics**

Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to quercetin. By consulting all of associations listed in this chapter, you will have nearly exhausted all sources for patient associations concerned with quercetin.

The National Health Information Center (NHIC)

The National Health Information Center (NHIC) offers a free referral service to help people find organizations that provide information about quercetin. For more information, see the NHIC's Web site at **http://www.health.gov/NHIC/** or contact an information specialist by calling 1-800-336-4797.

Directory of Health Organizations

The Directory of Health Organizations, provided by the National Library of Medicine Specialized Information Services, is a comprehensive source of information on associations. The Directory of Health Organizations database can be accessed via the Internet at **http://www.sis.nlm.nih.gov/Dir/DirMain.html**. It is composed of two parts: DIRLINE and Health Hotlines.

The DIRLINE database comprises some 10,000 records of organizations, research centers, and government institutes and associations that primarily focus on health and biomedicine. To access DIRLINE directly, go to the following Web site: **http://dirline.nlm.nih.gov/**. Simply type in "quercetin" (or a synonym), and you will receive information on all relevant organizations listed in the database.

Health Hotlines directs you to toll-free numbers to over 300 organizations. You can access this database directly at **http://www.sis.nlm.nih.gov/hotlines/**. On this page, you are given the option to search by keyword or by browsing the subject list. When you have received your search results, click on the name of the organization for its description and contact information.

The Combined Health Information Database

Another comprehensive source of information on healthcare associations is the Combined Health Information Database. Using the "Detailed Search" option, you will need to limit your search to "Organizations" and "quercetin". Type the following hyperlink into your Web browser: **http://chid.nih.gov/detail/detail.html**. To find associations, use the drop boxes at the bottom of the search page where "You may refine your search by." For

publication date, select "All Years." Then, select your preferred language and the format option "Organization Resource Sheet." Type "quercetin" (or synonyms) into the "For these words:" box. You should check back periodically with this database since it is updated every three months.

The National Organization for Rare Disorders, Inc.

The National Organization for Rare Disorders, Inc. has prepared a Web site that provides, at no charge, lists of associations organized by health topic. You can access this database at the following Web site: **http://www.rarediseases.org/search/orgsearch.html**. Type "quercetin" (or a synonym) into the search box, and click "Submit Query."

APPENDIX C. FINDING MEDICAL LIBRARIES

Overview

In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Your local public library and medical libraries have interlibrary loan programs with the National Library of Medicine (NLM), one of the largest medical collections in the world. According to the NLM, most of the literature in the general and historical collections of the National Library of Medicine is available on interlibrary loan to any library. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.[22]

Finding a Local Medical Library

The quickest method to locate medical libraries is to use the Internet-based directory published by the National Network of Libraries of Medicine (NN/LM). This network includes 4626 members and affiliates that provide many services to librarians, health professionals, and the public. To find a library in your area, simply visit **http://nnlm.gov/members/adv.html** or call 1-800-338-7657.

Medical Libraries in the U.S. and Canada

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries with reference facilities that are open to the public. The following is the NLM's list and includes hyperlinks to each library's Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of

[22] Adapted from the NLM: **http://www.nlm.nih.gov/psd/cas/interlibrary.html**.

libraries recommended by the National Library of Medicine (sorted alphabetically by name of the U.S. state or Canadian province where the library is located)[23]:

- **Alabama:** Health InfoNet of Jefferson County (Jefferson County Library Cooperative, Lister Hill Library of the Health Sciences), **http://www.uab.edu/infonet/**
- **Alabama:** Richard M. Scrushy Library (American Sports Medicine Institute)
- **Arizona:** Samaritan Regional Medical Center: The Learning Center (Samaritan Health System, Phoenix, Arizona), **http://www.samaritan.edu/library/bannerlibs.htm**
- **California:** Kris Kelly Health Information Center (St. Joseph Health System, Humboldt), **http://www.humboldt1.com/~kkhic/index.html**
- **California:** Community Health Library of Los Gatos, **http://www.healthlib.org/orgresources.html**
- **California:** Consumer Health Program and Services (CHIPS) (County of Los Angeles Public Library, Los Angeles County Harbor-UCLA Medical Center Library) - Carson, CA, **http://www.colapublib.org/services/chips.html**
- **California:** Gateway Health Library (Sutter Gould Medical Foundation)
- **California:** Health Library (Stanford University Medical Center), **http://www-med.stanford.edu/healthlibrary/**
- **California:** Patient Education Resource Center - Health Information and Resources (University of California, San Francisco), **http://sfghdean.ucsf.edu/barnett/PERC/default.asp**
- **California:** Redwood Health Library (Petaluma Health Care District), **http://www.phcd.org/rdwdlib.html**
- **California:** Los Gatos PlaneTree Health Library, **http://planetreesanjose.org/**
- **California:** Sutter Resource Library (Sutter Hospitals Foundation, Sacramento), **http://suttermedicalcenter.org/library/**
- **California:** Health Sciences Libraries (University of California, Davis), **http://www.lib.ucdavis.edu/healthsci/**
- **California:** ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System, Pleasanton), **http://gaelnet.stmarys-ca.edu/other.libs/gbal/east/vchl.html**
- **California:** Washington Community Health Resource Library (Fremont), **http://www.healthlibrary.org/**
- **Colorado:** William V. Gervasini Memorial Library (Exempla Healthcare), **http://www.saintjosephdenver.org/yourhealth/libraries/**
- **Connecticut:** Hartford Hospital Health Science Libraries (Hartford Hospital), **http://www.harthosp.org/library/**
- **Connecticut:** Healthnet: Connecticut Consumer Health Information Center (University of Connecticut Health Center, Lyman Maynard Stowe Library), **http://library.uchc.edu/departm/hnet/**

[23] Abstracted from **http://www.nlm.nih.gov/medlineplus/libraries.html**.

- **Connecticut:** Waterbury Hospital Health Center Library (Waterbury Hospital, Waterbury), **http://www.waterburyhospital.com/library/consumer.shtml**
- **Delaware:** Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute, Wilmington), **http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm**
- **Delaware:** Lewis B. Flinn Library (Delaware Academy of Medicine, Wilmington), **http://www.delamed.org/chls.html**
- **Georgia:** Family Resource Library (Medical College of Georgia, Augusta), **http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/frl.htm**
- **Georgia:** Health Resource Center (Medical Center of Central Georgia, Macon), **http://www.mccg.org/hrc/hrchome.asp**
- **Hawaii:** Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library, Honolulu), **http://hml.org/CHIS/**
- **Idaho:** DeArmond Consumer Health Library (Kootenai Medical Center, Coeur d'Alene), **http://www.nicon.org/DeArmond/index.htm**
- **Illinois:** Health Learning Center of Northwestern Memorial Hospital (Chicago), **http://www.nmh.org/health_info/hlc.html**
- **Illinois:** Medical Library (OSF Saint Francis Medical Center, Peoria), **http://www.osfsaintfrancis.org/general/library/**
- **Kentucky:** Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital, Lexington), **http://www.centralbap.com/education/community/library.cfm**
- **Kentucky:** University of Kentucky - Health Information Library (Chandler Medical Center, Lexington), **http://www.mc.uky.edu/PatientEd/**
- **Louisiana:** Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation, New Orleans), **http://www.ochsner.org/library/**
- **Louisiana:** Louisiana State University Health Sciences Center Medical Library-Shreveport, **http://lib-sh.lsuhsc.edu/**
- **Maine:** Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital, Farmington), **http://www.fchn.org/fmh/lib.htm**
- **Maine:** Gerrish-True Health Sciences Library (Central Maine Medical Center, Lewiston), **http://www.cmmc.org/library/library.html**
- **Maine:** Hadley Parrot Health Science Library (Eastern Maine Healthcare, Bangor), **http://www.emh.org/hll/hpl/guide.htm**
- **Maine:** Maine Medical Center Library (Maine Medical Center, Portland), **http://www.mmc.org/library/**
- **Maine:** Parkview Hospital (Brunswick), **http://www.parkviewhospital.org/**
- **Maine:** Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center, Biddeford), **http://www.smmc.org/services/service.php3?choice=10**
- **Maine:** Stephens Memorial Hospital's Health Information Library (Western Maine Health, Norway), **http://www.wmhcc.org/Library/**

- **Manitoba, Canada:** Consumer & Patient Health Information Service (University of Manitoba Libraries), **http://www.umanitoba.ca/libraries/units/health/reference/chis.html**
- **Manitoba, Canada:** J.W. Crane Memorial Library (Deer Lodge Centre, Winnipeg), **http://www.deerlodge.mb.ca/crane_library/about.asp**
- **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Dept. of Public Libraries, Wheaton Regional Library), **http://www.mont.lib.md.us/healthinfo/hic.asp**
- **Massachusetts:** Baystate Medical Center Library (Baystate Health System), **http://www.baystatehealth.com/1024/**
- **Massachusetts:** Boston University Medical Center Alumni Medical Library (Boston University Medical Center), **http://med-libwww.bu.edu/library/lib.html**
- **Massachusetts:** Lowell General Hospital Health Sciences Library (Lowell General Hospital, Lowell), **http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm**
- **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital, Boston), **http://www.nebh.org/health_lib.asp**
- **Massachusetts:** St. Luke's Hospital Health Sciences Library (St. Luke's Hospital, Southcoast Health System, New Bedford), **http://www.southcoast.org/library/**
- **Massachusetts:** Treadwell Library Consumer Health Reference Center (Massachusetts General Hospital), **http://www.mgh.harvard.edu/library/chrcindex.html**
- **Massachusetts:** UMass HealthNet (University of Massachusetts Medical School, Worchester), **http://healthnet.umassmed.edu/**
- **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services), **http://www.botsfordlibrary.org/consumer.htm**
- **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers), **http://www.providence-hospital.org/library/**
- **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center), **http://www.mgh.org/center.html**
- **Michigan:** Patient Education Resouce Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center, Ann Arbor), **http://www.cancer.med.umich.edu/learn/leares.htm**
- **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information (Detroit), **http://www.henryford.com/body.cfm?id=39330**
- **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center, Missoula)
- **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section), **http://caphis.mlanet.org/directory/index.html**
- **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, **http://nnlm.gov/**
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), **http://nnlm.gov/members/**

- **Nevada:** Health Science Library, West Charleston Library (Las Vegas-Clark County Library District, Las Vegas), **http://www.lvccld.org/special_collections/medical/index.htm**
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library, Hanover), **http://www.dartmouth.edu/~biomed/resources.htmld/conshealth.htmld/**
- **New Jersey:** Consumer Health Library (Rahway Hospital, Rahway), **http://www.rahwayhospital.com/library.htm**
- **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center, Englewood), **http://www.englewoodhospital.com/links/index.htm**
- **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center, Englewood), **http://www.geocities.com/ResearchTriangle/9360/**
- **New York:** Choices in Health Information (New York Public Library) - NLM Consumer Pilot Project participant, **http://www.nypl.org/branch/health/links.html**
- **New York:** Health Information Center (Upstate Medical University, State University of New York, Syracuse), **http://www.upstate.edu/library/hic/**
- **New York:** Health Sciences Library (Long Island Jewish Medical Center, New Hyde Park), **http://www.lij.edu/library/library.html**
- **New York:** ViaHealth Medical Library (Rochester General Hospital), **http://www.nyam.org/library/**
- **Ohio:** Consumer Health Library (Akron General Medical Center, Medical & Consumer Health Library), **http://www.akrongeneral.org/hwlibrary.htm**
- **Oklahoma:** The Health Information Center at Saint Francis Hospital (Saint Francis Health System, Tulsa), **http://www.sfh-tulsa.com/services/healthinfo.asp**
- **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center, The Dalles), **http://www.mcmc.net/phrc/**
- **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center, Hershey), **http://www.hmc.psu.edu/commhealth/**
- **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center, Danville), **http://www.geisinger.edu/education/commlib.shtml**
- **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital, Scranton), **http://www.mth.org/healthwellness.html**
- **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System, Pittsburgh), **http://www.hsls.pitt.edu/guides/chi/hopwood/index_html**
- **Pennsylvania:** Koop Community Health Information Center (College of Physicians of Philadelphia), **http://www.collphyphil.org/kooppg1.shtml**
- **Pennsylvania:** Learning Resources Center - Medical Library (Susquehanna Health System, Williamsport), **http://www.shscares.org/services/lrc/index.asp**
- **Pennsylvania:** Medical Library (UPMC Health System, Pittsburgh), **http://www.upmc.edu/passavant/library.htm**
- **Quebec, Canada:** Medical Library (Montreal General Hospital), **http://www.mghlib.mcgill.ca/**

- **South Dakota:** Rapid City Regional Hospital Medical Library (Rapid City Regional Hospital), **http://www.rcrh.org/Services/Library/Default.asp**
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), **http://hhw.library.tmc.edu/**
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), **http://www.kvch.com/**
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center, Vancouver), **http://www.swmedicalcenter.com/body.cfm?id=72**