2022-4 Bitter Food Is Good

God made people and their food perfect, but people think that they know better and try to improve on God's creation. People in general, do not like the bitter taste of bitter herbs, or any bitter food. So we changed the food. Removing the bitter taste from food comes at a great cost to our health.

1st article: Dietary phytonutrients found in vegetables and fruit appear to lower the risk of cancer and cardiovascular disease. Studies on the mechanisms of chemoprotection have focused on the biological activity of plant-based phenols and polyphenols, flavonoids, terpenes, isoflavones, and glucosinolates. The food industry routinely removes these bitter compounds from plant foods. Some have long been viewed as plant-based toxins.

2nd article: The treatment of cancer with chemotherapeutic agents and radiation has two major problems: time-dependent development of tumor resistance to therapy (chemoresistance and radioresistance) and nonspecific toxicity toward normal cells. How these bitter polyphenols protect normal cells and sensitize tumor cells to treatment is discussed in this review. They are synergistic with chemotherapeutic agents and radiation.

3rd article: The Mayo Clinic lists bitter herbs as part of complementary and alternative medicine (CAM) for chronic pain. Physicians who care for patients with chronic pain should have some familiarity with these therapies, so they can advise their patients.

4th article: Doctors from The University of Texas, MD Anderson Cancer Center describe the clinical benefits of Curcumin, just one of the ingredients of Turmeric. Promising effects have been observed in patients with various pro-inflammatory diseases including cancer, cardiovascular disease, arthritis, uveitis, ulcerative proctitis, Crohn's disease, ulcerative colitis, irritable bowel disease, tropical pancreatitis, peptic ulcer, gastric ulcer, idiopathic orbital inflammatory pseudotumor, oral lichen planus, gastric inflammation, vitiligo, psoriasis,

acute coronary syndrome, atherosclerosis, diabetes, diabetic nephropathy, diabetic microangiopathy, lupus nephritis, renal conditions, acquired immunodeficiency syndrome, β-thalassemia, biliary dyskinesia, Dejerine-Sottas disease, cholecystitis, and chronic bacterial prostatitis. Curcumin has also shown protection against hepatic conditions, chronic arsenic exposure, and alcohol intoxication.

5th article: Doctors from The University of Texas, MD Anderson Cancer Center describe the clinical benefits of other ingredients in Turmeric. This validates the superiority of the whole-food philosophy vs the single-extract (drug) paradigm of FDA and the medical community.

6th article: To date, over 100 different clinical trials have been completed with curcumin, which clearly show its safety, tolerability and its effectiveness against various chronic diseases in humans. However, more clinical trials in different populations are necessary to prove its potential against different chronic diseases in humans. This review's primary focus is on lessons learned about curcumin from clinical trials. Furthermore, this compound has also been shown to be synergistic with other nutraceuticals such as resveratrol, piperine, catechins, quercetin and genistein. See the many functions of Curcumin in the picture. They are bitter phytosterols like Luteolin in the next article.

7th article: This is an example of thinking like a drug company. Individual plant ingredients are studied alone like a drug. As mentioned above the plant combinations are synergistic. We will learn a lot about the versatility of these bitter ingredients. See the diagram of its apoptosis effects.

8th article: As more is learned about the many benefits of Luteolin alone the list of benefits will grow for all of the bitter plant ingredients. God provided plants with the bitter phytosterols in synergistic combination, not individually.

9th article: Organisms are set to live within an optimum narrow range of oxygen, quite specific for each cell type. Too much oxygen and too little is harmful to all living things.

Whole abstracts of the articles above:

1st

Am J Clin Nutr
actions
. 2000 Dec;72(6):1424-35. doi: 10.1093/ajcn/72.6.1424.

Bitter taste, phytonutrients, and the consumer: a review

A Drewnowski 1 , C Gomez-Carneros
Affiliations collapse
1. Nutritional Sciences Program, School of Public Health and Community Medicine, University of Washington, Seattle, WA 98195, USA.

• PMID: 11101467 DOI: 10.1093/ajcn/72.6.1424

Abstract

Dietary phytonutrients found in vegetables and fruit appear to lower the risk of cancer and cardiovascular disease. Studies on the mechanisms of chemoprotection have focused on the biological activity of plant-based phenols and polyphenols, flavonoids, isoflavones, terpenes, and glucosinolates. Enhancing the phytonutrient content of plant foods through selective breeding or genetic improvement is a potent dietary option for disease prevention. However, most, if not all, of these bioactive compounds are bitter, acrid, or astringent and therefore aversive to the consumer. Some have long been viewed as plant-based toxins. As a result, the food industry routinely removes these compounds from plant foods through selective breeding and a variety of debittering processes. This poses a dilemma for the designers of functional foods because increasing the content of bitter phytonutrients for health may be wholly incompatible with consumer acceptance. Studies on phytonutrients and health ought to take sensory factors and food preferences into account.

2nd

Review
Antioxid Redox Signal

actions:
. Nov-Dec 2005;7(11-12):1630-47. doi: 10.1089/ars.2005.7.1630.
Chemosensitization and radiosensitization of tumors by plant polyphenols
Amit K Garg 1, Thomas A Buchholz, Bharat B Aggarwal
Affiliations collapse
Affiliation
- 1
Department of Radiation Oncology, The University of Texas M.D. Anderson Cancer Center, Houston, TX 77030, USA.
- PMID: 16356126 DOI: 10.1089/ars.2005.7.1630
Abstract
The treatment of cancer with chemotherapeutic agents and radiation has two major problems: time-dependent development of tumor resistance to therapy (chemoresistance and radioresistance) and nonspecific toxicity toward normal cells. Many plant-derived polyphenols have been studied intently for their potential chemopreventive properties and are pharmacologically safe. These compounds include genistein, curcumin, resveratrol, silymarin, caffeic acid phenethyl ester, flavopiridol, emodin, green tea polyphenols, piperine, oleandrin, ursolic acid, and betulinic acid. Recent research has suggested that these plant polyphenols might be used to sensitize tumor cells to chemotherapeutic agents and radiation therapy by inhibiting pathways that lead to treatment resistance. These agents have also been found to be protective from therapy-associated toxicities. **How these polyphenols protect normal cells and sensitize tumor cells to treatment is discussed in this review.**
Antioxid. Redox Signal. 7, 1630-1647.

3rd
Review
Chin J Integr Med
actions:
. 2016 Jun;22(6):403-11. doi: 10.1007/s11655-016-2258-y. Epub 2016 May 26.

Complementary and alternative medicine therapies for chronic pain

Brent A Bauer [1], Jon C Tilburt [2], Amit Sood [2], Guang-Xi Li [3] [4], Shi-Han Wang [4] [5]

Affiliations collapse

Affiliations

- 1 Division of Complementary and Integrative Medicine, Mayo Clinic, Rochester, Minnesota, 55905, USA. Bauer.brent@mayo.edu.
- 2 Division of Complementary and Integrative Medicine, Mayo Clinic, Rochester, Minnesota, 55905, USA.
- 3 Division of Pulmonary and Critical Care Medicine, Mayo Clinic, Rochester, Minnesota, 55905, USA.
- 4 Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Beijing, 100053, China.
- 5 Division of Cardiovascular Diseases, Mayo Clinic, Rochester, Minnesota, 55905, USA.

- PMID: 27339090 DOI: 10.1007/s11655-016-2258-y

Abstract

Pain afflicts over 50 million people in the US, with 30.7% US adults suffering with chronic pain. Despite advances in therapies, many patients will continue to deal with ongoing symptoms that are not fully addressed by the best conventional medicine has to offer them. The patients frequently turn to therapies outside the usual purview of conventional medicine (herbs, acupuncture, meditation, etc.) called complementary and alternative medicine (CAM). Academic and governmental groups are also starting to incorporate CAM recommendations into chronic pain management strategies. Thus, for any physician who care for patients with chronic pain, having some familiarity with these therapies-including risks and benefits-will be key to helping guide patients in making evidence-based, well informed decisions about whether or not to use such therapies. On the other hand, if a CAM therapy has evidence of both safety and efficacy then not mak-

ing it available to a patient who is suffering does not meet the need of the patient. We summarize the current evidence of a wide variety of CAM modalities that have potential for helping patients with chronic pain in this article. **The triad of chronic pain symptoms, ready access to information on the internet, and growing patient empowerment suggest that CAM therapies will remain a consistent part of the healthcare of patients dealing with chronic pain.**

Keywords: chronic pain; complementary and alternative medicine; safety and efficacy; therapy.

4th

Review

AAPS J

actions:

. 2013 Jan;15(1):195-218. doi: 10.1208/s12248-012-9432-8. Epub 2012 Nov 10.

Therapeutic roles of curcumin: lessons learned from clinical trials

Subash C Gupta 1, Sridevi Patchva, Bharat B Aggarwal

Affiliations collapse

Affiliation

- 1 Cytokine Research Laboratory, Department of Experimental Therapeutics, The University of Texas MD Anderson Cancer Center, 1901 East Road, Unit # 1950, Houston, TX 77054, USA.

- PMID: 23143785 PMCID: PMC3535097 DOI: 10.1208/s12248-012-9432-8

Free PMC article

Abstract

Extensive research over the past half century has shown that curcumin (diferuloylmethane), a component of the golden spice turmeric (Curcuma longa), can modulate multiple cell signaling pathways. **Extensive clinical trials over the past quarter century have addressed the pharmacokinetics, safety, and efficacy of this nutraceutical against numerous diseases in humans. Some promising effects have been observed in patients with various pro-inflammatory diseases including cancer, cardiovascular disease, arthritis, uveitis, ulcerative proctitis, Crohn's**

disease, ulcerative colitis, irritable bowel disease, tropical pancreatitis, peptic ulcer, gastric ulcer, idiopathic orbital inflammatory pseudotumor, oral lichen planus, gastric inflammation, vitiligo, psoriasis, acute coronary syndrome, atherosclerosis, diabetes, diabetic nephropathy, diabetic microangiopathy, lupus nephritis, renal conditions, acquired immunodeficiency syndrome, β-thalassemia, biliary dyskinesia, Dejerine-Sottas disease, cholecystitis, and chronic bacterial prostatitis. Curcumin has also shown protection against hepatic conditions, chronic arsenic exposure, and alcohol intoxication. Dose-escalating studies have indicated the safety of curcumin at doses as high as 12 g/day over 3 months. Curcumin's pleiotropic activities emanate from its ability to modulate numerous signaling molecules such as pro-inflammatory cytokines, apoptotic proteins, NF-κB, cyclooxygenase-2, 5-LOX, STAT3, C-reactive protein, prostaglandin E(2), prostate-specific antigen, adhesion molecules, phosphorylase kinase, transforming growth factor-β, triglyceride, ET-1, creatinine, HO-1, AST, and ALT in human participants. In clinical trials, curcumin has been used either alone or in combination with other agents. Various formulations of curcumin, including nanoparticles, liposomal encapsulation, emulsions, capsules, tablets, and powder, have been examined. In this review, we discuss in detail the various human diseases in which the effect of curcumin has been investigated.

5th

Review

Mol Nutr Food Res

actions:

. 2013 Sep;57(9):1529-42. doi: 10.1002/mnfr.201200838. Epub 2013 Jul 12.

Curcumin-free turmeric exhibits anti-inflammatory and anticancer activities: Identification of novel components of turmeric

Bharat B Aggarwal 1 , Wei Yuan, Shiyou Li, Subash C Gupta

Affiliations collapse

Affiliation

- 1
  Cytokine Research Laboratory, Department of Experimental Therapeutics, The University of Texas MD Anderson Cancer Center, Houston, TX 77054, USA. aggarwal@mdanderson.org

- PMID: 23847105 DOI: 10.1002/mnfr.201200838

Abstract

Turmeric, a dried powder derived from the rhizome of Curcuma longa, has been used for centuries in certain parts of the world and **has been linked to numerous biological activities including antioxidant, anti-inflammatory, anticancer, antigrowth, anti-arthritic, anti-atherosclerotic, antidepressant, anti-aging, antidiabetic, antimicrobial, wound healing, and memory-enhancing activities. One component of turmeric is curcumin, which has been extensively studied, as indicated by more than 5600 citations, most of which have appeared within the past decade. Recent research has identified numerous chemical entities from turmeric other than curcumin. It is unclear whether all of the activities ascribed to turmeric are due to curcumin or whether other compounds in turmeric can manifest these activities uniquely, additively, or synergistically with curcumin. However, studies have indicated that turmeric oil, present in turmeric, can enhance the bioavailability of curcumin. Studies over the past decade have indicated that curcumin-free turmeric (CFT) components possess numerous biological activities including anti-inflammatory, anticancer, and antidiabetic activities. Elemene derived from turmeric is approved in China for the treatment of cancer. The current review focuses on the anticancer and anti-inflammatory activities exhibited by CFT and by some individual components of turmeric, including turmerin, turmerone, elemene, furanodiene, curdione, bisacurone, cyclocurcumin, calebin A, and germacrone.**

Keywords: Apoptosis; Cancer; Inflammation; Turmeric; Turmeric components.

6th

Review

Br J Pharmacol

actions:

. 2017 Jun;174(11):1325-1348. doi: 10.1111/bph.13621. Epub 2016 Oct 21.

Curcumin, the golden nutraceutical: multitargeting for multiple chronic diseases

Ajaikumar B Kunnumakkara 1 , Devivasha Bordoloi 1 , Ganesan Padmavathi 1 , Javadi Monisha 1 , Nand Kishor Roy 1 , Sahdeo Prasad 2 , Bharat B Aggarwal 3
Affiliations collapse
Affiliations

- 1 Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati, Assam, India.
- 2 Department of Experimental Therapeutics, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA.
- 3 Anti-Inflammation Research Institute, San Diego, California, USA.

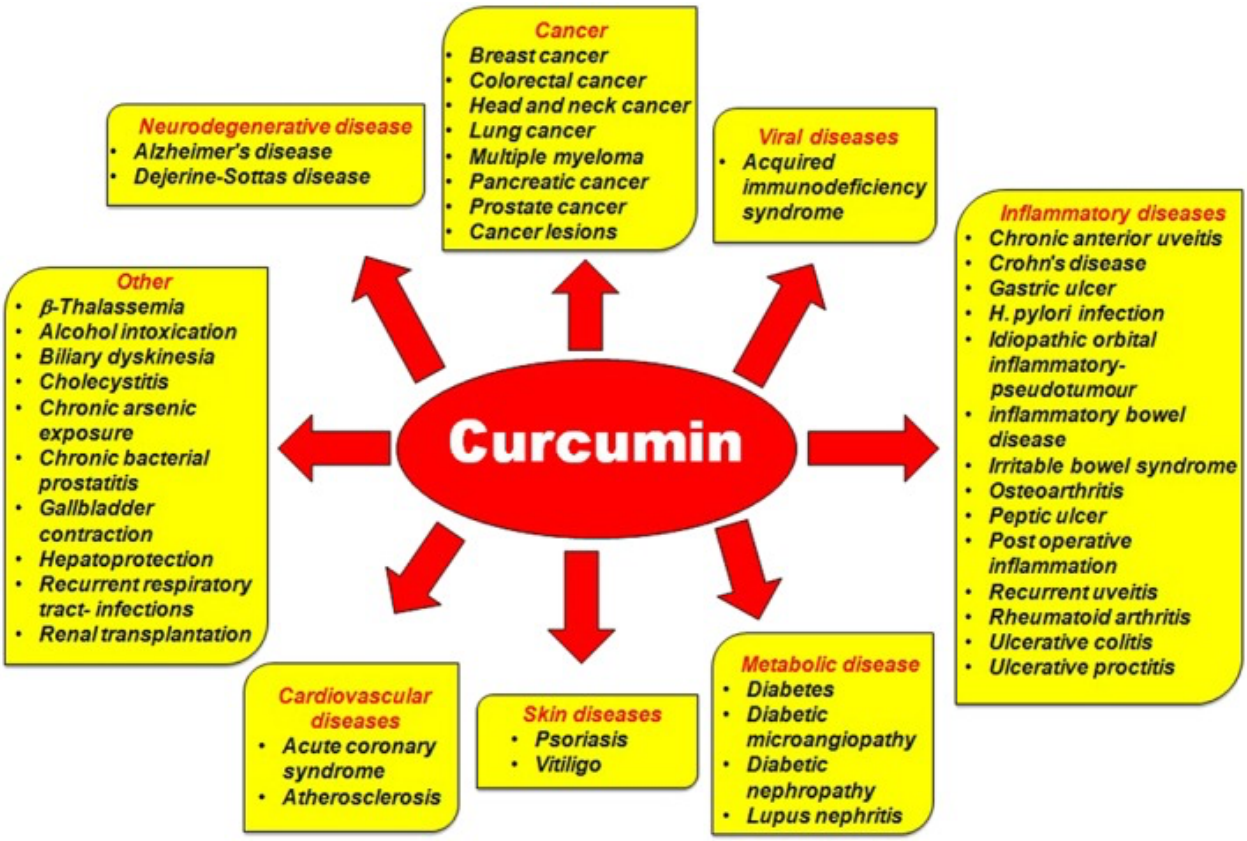
- PMID: 27638428 PMCID: PMC5429333 DOI: 10.1111/bph.13621

Free PMC article

Abstract

Curcumin, a yellow pigment in the Indian spice Turmeric (Curcuma longa), which is chemically known as diferuloylmethane, was first isolated exactly two centuries ago in 1815 by two German Scientists, Vogel and Pelletier. However, according to the pubmed database, the first study on its biological activity as an antibacterial agent was published in 1949 in Nature and the first clinical trial was reported in The Lancet in 1937. **Although the current database indicates almost 9000 publications on curcumin, until 1990 there were less than 100 papers published on this nutraceutical. At the molecular level, this multitargeted agent has been shown to exhibit anti-inflammatory activity through the suppression of numerous cell signalling pathways including NF-κB, STAT3, Nrf2, ROS and COX-2. Numerous studies have indicated that curcumin is a highly potent antimicrobial agent and has been shown to be active against various chronic diseases including various types of cancers, diabetes, obesity, cardiovascular, pulmonary, neurological and autoimmune diseases. Furthermore, this compound has also been shown to be synergistic with other nutraceuticals such as resveratrol, piperine, catechins, quercetin and genistein. To date, over**

100 different clinical trials have been completed with curcumin, which clearly show its safety, tolerability and its effectiveness against various chronic diseases in humans. However, more clinical trials in different populations are necessary to prove its potential against different chronic diseases in humans. This review's primary focus is on lessons learnt about curcumin from clinical trials.



7th

Review

Curr Cancer Drug Targets

actions:

. 2008 Nov;8(7):634-46. doi: 10.2174/156800908786241050.

Luteolin, a flavonoid with potential for cancer prevention and therapy

Yong Lin 1 , Ranxin Shi, Xia Wang, Han-Ming Shen
1 Molecular Biology and Lung Cancer Program, Lovelace Respiratory Research Institute, 2425 Ridgecrest Dr., SE, Albuquerque, NM 87108, USA. ylin@lrri.org
• PMID: 18991571 PMCID: PMC2615542 DOI: 10.2174/156800908786241050

Free PMC article

Abstract

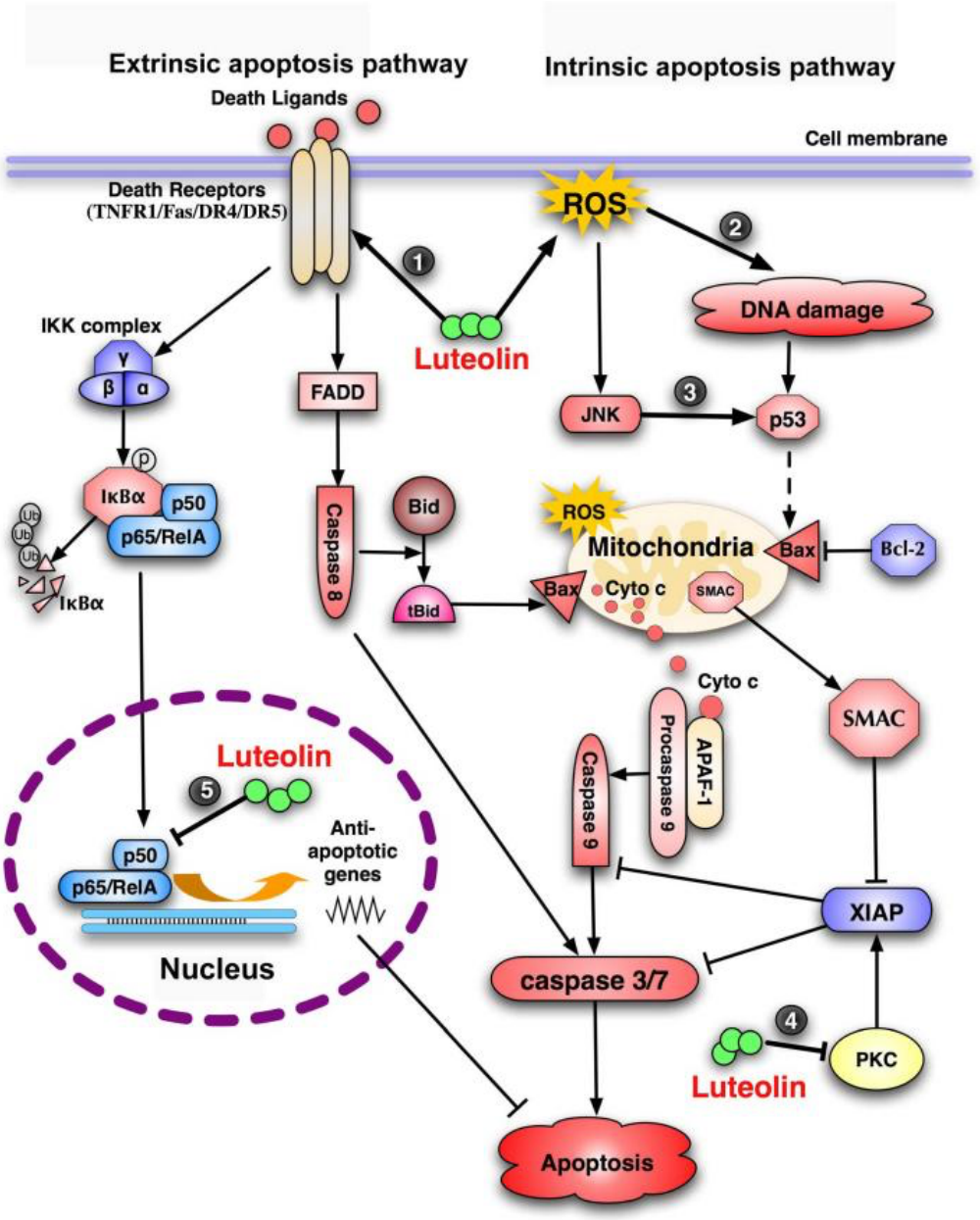
Luteolin, 3',4',5,7-tetrahydroxyflavone, is a common flavonoid that exists in many types of plants including fruits, vegetables, and medicinal herbs. Plants rich in luteolin have been used in Chinese traditional medicine for treating various diseases such as hypertension, inflammatory disorders, and cancer. Having multiple biological effects such as anti-inflammation, anti-allergy and anticancer, luteolin functions as either an antioxidant or a pro-oxidant biochemically. The biological effects of luteolin could be functionally related to each other. For instance, the anti-inflammatory activity may be linked to its anticancer property. Luteolin's anticancer property is associated with the induction of apoptosis, and inhibition of cell proliferation, metastasis and angiogenesis. Furthermore, luteolin sensitizes cancer cells to therapeutic-induced cytotoxicity through suppressing cell survival pathways such as phosphatidylinositol 3'-kinase (PI3K)/Akt, nuclear factor kappa B (NF-kappaB), and X-linked inhibitor of apoptosis protein (XIAP), and stimulating apoptosis pathways including those that induce the tumor suppressor p53. These observations suggest that luteolin could be an anticancer agent for various cancers. Furthermore, recent epidemiological studies have attributed a cancer prevention property to luteolin. In this review, we summarize the progress of recent research on luteolin, with a particular focus on its anticancer role and molecular mechanisms underlying this property of luteolin.

8th

Review

Biofactors

actions:



. 2021 Mar;47(2):190-197. doi: 10.1002/biof.1687. Epub 2020 Oct 24.

Neuroprotective effects of flavone luteolin

Neuroprotective effects of flavone luteolin in neuroinflammation and neurotrauma

Duraisamy Kempuraj 1 2 3, Ramasamy Thangavel 1 2 3, Deepak D Kempuraj 1 4, Mohammad Ejaz Ahmed 1 2 3, Govindhasamy Pushpavathi Selvakumar 1 2 3, Sudhanshu P Raikwar 1 2 3, Smita A Zaheer 1 2, Shankar S Iyer 1 2 3, Raghav Govindarajan 1, Premkumar Nattanmai Chandrasekaran 1, Asgar Zaheer 1 2 3

Affiliations collapse

Affiliations

- 1
  Department of Neurology, School of Medicine, University of Missouri, Columbia, Missouri, USA.
- 2
  The Center for Translational Neuroscience, School of Medicine, University of Missouri, Columbia, Missouri, USA.
- 3
  Harry S. Truman Memorial Veterans Hospital, U.S. Department of Veterans Affairs, Columbia, Missouri, USA.
- 4
  David H. Hickman High School, Columbia Public Schools, Columbia, Missouri, USA.
- PMID: 33098588 DOI: 10.1002/biof.1687

Abstract

Neuroinflammation leads to neurodegeneration, cognitive defects, and neurodegenerative disorders. Neurotrauma/traumatic brain injury (TBI) can cause activation of glial cells, neurons, and neuroimmune cells in the brain to release neuroinflammatory mediators. Neurotrauma leads to immediate primary brain damage (direct damage), neuroinflammatory responses, neuroinflammation, and late secondary brain damage (indirect) through neuroinflammatory mechanism. Secondary brain damage leads to chronic inflammation and the onset and progression of neurodegenerative diseases. **Currently, there are no effective and specific therapeutic options to treat these brain damages or neurodegenerative diseases.** Flavone luteolin is an important natural polyphenol present in several plants that show anti-inflammatory, antioxidant, anticancer, cytoprotective, and macrophage polarization effects. **In this short review article, we have reviewed the neuroprotective effects of luteolin in neurotrauma and neurodegenerative disorders and pathways involved in this mechanism.** We have collected data for this study from publications in the PubMed using the keywords luteolin and mast cells, neuroinflammation, neurodegenerative

diseases, and TBI. Recent reports suggest that luteolin suppresses systemic and neuroinflammatory responses in Coronavirus disease 2019 (COVID-19). Studies have shown that luteolin exhibits neuroprotective effects through various mechanisms, including suppressing immune cell activation, such as mast cells, and inflammatory mediators released from these cells. **In addition, luteolin can suppress neuroinflammatory response, activation of microglia and astrocytes, oxidative stress, neuroinflammation, and the severity of neuroinflammatory diseases such as Alzheimer's disease, Parkinson's disease, multiple sclerosis, and TBI pathogenesis**. **In conclusion, luteolin can improve cognitive decline and enhance neuroprotection in neurodegenerative diseases, TBI, and stroke.**

Keywords: blood-brain barrier; luteolin; mast cells; neurodegenerative diseases; neuroinflammation; neurotrauma; tight junction proteins; traumatic brain injury.

9th

Review

Biofactors

actions:

. 2018 May;44(3):207-218. doi: 10.1002/biof.1419. Epub 2018 Feb 27.

Need (more than) two to Tango: Multiple tools to adapt to changes in oxygen availability

1 , 2 , 2 , 3

Affiliations collapse

Affiliations

- 1 Department of Nutrition and Health Sciences, University of Nebraska-Lincoln, Lincoln, NE, USA.
- 2 Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy.

- 3
  Council for Agricultural Research and Economics-Food and Nutrition Research Centre (CREA-AN), Rome, Italy.

- PMID: 29485192 DOI: 10.1002/biof.1419

Abstract

Oxygen is a fundamental element for the life of a large number of living organisms allowing an efficient energetic utilization of substrates. Organisms relying on oxygen evolved complex structures for oxygen delivery and biochemical machineries dealing with its safe utilization and the ability to overcome the potentially harmful consequences of changes in oxygen availability. **On fact, cells composing complex Eukaryotic organisms are set to live within an optimum narrow range of oxygen, quite specific for each cell type. Minute modifications of oxygen availability, either positive or negative, induce the expression of specific genes,** the major **actors of this responses being the transcription factors HIF and Nrf2 that control the attempt to cope with low oxygen (hypoxia) or to either high oxygen or to an oxygen "overflow," respectively**. **This review describes the interaction between these two transcription factors and their interaction with the transcription factor NF-κB acting as a pivotal determinant of final cell response.** © 2018 BioFactors, 44(3):207-218, 2018.

Keywords: HIF; NF-κB; Nrf2; hyperoxia; hypoxia.