



Food as Medicine

The Counseling Center at CELA

Mast Cell Stabilizing Foods

© 2018

All rights reserved. This publication may be copied and shared for educational purposes only.

Correspondence:

CELA – The Center for Expressive Living & Creative Arts

675 VFW Parkway #271, Chestnut Hill MA 02467

celaonline.com | counselingatcela.com | cela@celaonline.com

If you feel that you may have a mast cell disease (MCD), a mast cell activation related disorder, or environmental illness contact a qualified physician to receive medical help. The information presented here is not medical advice and is in no way a substitute for receiving medical advice and treatment from a doctor.

Acknowledgement:

Thank you to the health professionals who have so generously shared their work on the internet. This booklet/ebook/pdf would not exist without your dedication, knowledge, giving spirit, and compassion.

Mast Cells & the Body

Mast cells are involved in the body's immune system response that include hyper-sensitivity and allergic reactions. Mast cells are found throughout the body, in all organ systems, throughout the body's connective tissue, especially beneath the surface of the skin, near blood vessels, within nerves, throughout the respiratory system, and in the digestive and urinary tracts.

Mast cells store all sorts of chemicals including histamine, interleukins, proteoglycans such as heparin, and more). When a mast cell encounters something—a substance—that it thinks is a threat to the body, the mast cell degranulates, it crumbles apart, and releases the chemicals. The histamine and other chemicals being pumped into the body by the degranulating mast cells causes the reactions we recognize as allergic reactions. These can include but are not limited to: rashes, hives, itching, flushing, swelling of lips, face, tongue, mouth, airway, increased mucus production, blood pressure changes, vertigo and dizziness, blurred vision, hearing impairment, cognitive impairments, and more.

Mast cell activation and degranulation lead to the freeing up of various mediator chemicals and substances in the body such as histamine, serotonin, tryptase, heparin, substance P, interleukins, and more. A person with a mast cell activation spectrum disorder can suffer from various clinical symptoms that are related to mast cell degranulation and/or infiltration. These symptoms can be chronic (e.g., pruritus, urticaria pigmentosa, headache, articular and muscular pain, memory loss, attention impairment, depression,) or paroxysmal—sudden increase or recurrence of symptoms—(such as, flush, anaphylaxis, anaphylactic-like episodes, fainting.) Chronic symptoms can be especially disabling and can significantly affect people in their personal, social, and professional lives (Moura, Sultan, Georgin-Lavialle, et al, 2012).

Mast cells tend to proliferate in the places where our bodies come into direct contact with the environment (skin, respiratory, GI system, and the brain.) When a person comes into contact with a chemical or substance in the environment to which they react, mast cells will degranulate in response and the person will exhibit symptoms—reactions—specific to the organs system(s) involved.

In the GI system (when we eat something that is perceived as harmful for some reason,) mast cell responses can include but are not limited to increased fluid secretion, increased muscle contraction which can cause vomiting and diarrhea, abdominal pain, the movement of fecal matter more quickly through the colon (verywellhealth.com/what-are-mast-cells-1944889). Mast cells are found throughout the lining of the gut and play a role in promoting a healthy balance of the bacteria that make up our gut flora as well as playing a role in destroying and protecting our bodies from any pathogenic bacteria (IBID).

Mast cells line the intestinal tract. Due to their effects in terms of immune response, mast cells have been implicated in playing a role in food allergy and Irritable Bowel Syndrome (see T.C. Theoharides, PhD, MD, mastcellmaster.com/publications.php and www.verywellhealth.com/ibs-4014702). The symptoms which are effects of mast cells include but are not limited to fast transit of stool resulting in diarrhea, increased fluid secretion in the large intestine contributing to diarrhea, visceral hypersensitivity leading to abdominal pain (IBID).

In the respiratory system, mast cells are found throughout the lining of our respiratory tracts. Mast cells will, in response to something perceived as harmful (when inhaled,) trigger an immune response that can include but is not limited to constriction of the airway, congestion, coughing, increased mucus production, difficulty breathing, difficulty swallowing. It is not surprising that mast cells are involved in the symptoms of asthma (IBID).

In the integumentary system (the skin) - The body recognizes two main types of antigens, foreign antigens and autoantigens. Foreign antigens originate outside the body (such as, the substances produced by viruses, bacteria, microorganisms, substances in snake venom, certain proteins in foods, and components of serum and red blood cells from other people.) Autoantigens originate within the body. Usually, the body is able to tell the difference between its self and not-self, however, in an individual who has an autoimmune disorder, normal body substances provoke an immune response (<https://www.britannica.com/science/>).

One way a person can experience skin reactions is through antigens in the foods we eat entering the blood through the GI tract. As these antigens circulate through the body they come into contact with mast cells that are located in the skin's tissues and cause an inflammatory response. The inflammatory response can result in swelling, hives, skin eruptions, skin flushing, eczema, and more (www.verywellhealth.com). Another route for triggering a reaction is when a person comes into contact with an external substance in the environment that triggers the same mast cell degranulating response leading to reactions such as swelling, hives, flushing, skin eruptions, eczema, and more.

Mast cells and the brain. Mast cells have been found in critical areas of the brain, especially in the thalamus and hypothalamus, where they are in close association with vessels and neurons. There, they may secrete in response to either stimuli generated within the cells (endogenous stimuli such as kinins, myelin basic protein, neuropeptides, or neurotransmitters) as well as in response to stimuli entering the body from the outside (exogenous stimuli such as antigens, cold, trauma, or viruses). Secretion of mast cell mediators could then trigger a cyclic reaction by affecting all local organs involved, as well as mast cell secretion itself, (Theoharides, mastcellmaster.com/publications.php, "Mast cells: the immune gate to the brain," 1990).

Cognitive complaints of memory and attention disturbances are common in mast cell activation related disorders. Current research has shown evidence for memory and attention impairment in 70% of sample patients with a systemic mast cell disorder and suggests that mast cell degranulation impacts memory function through the release of its mediators including histamine. Other neuropsychiatric symptoms such as depression are also present with high frequency in systemic mast cell activation disorders (Moura, Sultan, Georgin-Lavialle, et al, 2012).

Mast cell disease(s) (MCD) is the term used by mast cell specialists in the USA and internationally for all mast cell diseases and is inclusive of every person suffering from any kind of mast cell disease (TMSforacure.org). In MCD and mast cell activation related disorders, current research provides substantial evidence for high prevalence of cognitive impairment with memory and attention impairments characterized by immediate auditory and working memory disabling (Moura, Sultan, Georgin-Lavialle, et al, 2012).

In the research conducted by Moura, Sultan, Georgin-Lavialle, et al, working memory impairment was the most frequent with 73% of their sample followed by 41% auditory immediate memory impairment. Auditory delayed memory and visual memory impairments concerned 31.8% of patients and appeared only in the context of auditory immediate and/or working memory disturbances. Patients presenting delayed memory impairment were significantly more impaired in attention/working memory than patients without such impairment and presented more severe cognitive impairment (Moura, Sultan, Georgin-Lavialle, et al, 2012).

This research has also shown that in patients with MCD and mast cell activation disorders, cognitive impairment is not related to depression but rather to abnormal number and/or activation of mast cells. The researchers propose as a hypothesis for this lack of correlation between cognitive symptoms and depression that specific mediators released by degranulating mast cells would be required to provoke depressive symptoms while a broad range of mediators could impair cognitive process (Moura, Sultan, Georgin-Lavialle, et al, 2012).

Mast cells are present in the brain, especially in the hypothalamus which is implicated in both emotion and cognitive systems. There are several reports which have suggested the implication of mast cells in anxious-depressive symptoms, in autism spectrum disorders, and in neurological diseases such as Alzheimer and multiple sclerosis (Moura, Sultan, Georgin-Lavialle, et al, 2012). Therefore, alteration in the number or abnormal activation of mast cells could potentially affect cognitive and emotional systems (Moura, Sultan, Georgin-Lavialle, et al, 2012).

Mast cells and Inflammation. Mast cells have become very well known for their role in allergic responses and anaphylaxis reactions, as well as for their involvement in acquired and innate immunity. Research, (see <https://pubmed.ncbi.nlm.nih.gov/21185371/> and

<https://mastcellmaster.com>,) now shows mast cell involvement in inflammatory diseases such as atopic dermatitis, psoriasis, multiple sclerosis, arthritis and rheumatoid arthritis, (see <https://pubmed.ncbi.nlm.nih.gov/15642148/> and also research found here <https://pubmed.ncbi.nlm.nih.gov/22112783/>).

Sources of Mast Cell Stabilizing Agents

Natural sources of mast cell stabilizing agents include flavonoids, phenols, polyphenols, and curcumin/turmeric (Finn & Walsh, 2013).

Flavonoids are a diverse group of plant chemicals found in almost all fruits and vegetables. Along with carotenoids, they are responsible for the vivid colors of fruits and vegetables. Flavonoids are the largest group of plant chemicals—phytonutrients—with more than 6,000 types. Some of the best known flavonoids are quercetin and kaempferol (www.livescience.com/52524-flavonoids.html).

Phenols are a large group of chemical compounds that are found in plants. These chemicals make up the active substances in many plants and are responsible for controlling the activity of a range of enzymes and cell receptors, protecting the plant from bacterial and fungal infections and UV radiation damage (livestrong.com/article165497-list-of-high-phenol-foods/). Phenols have high protective properties and high antioxidant profiles.

Salicylates are one type of phenol in the phenol family that scientists believe are produced by plants for use as their own natural protection from diseases, insects, fungi, and harmful bacterial (scdlifestyle.com). Salicylates are very similar to the man-made chemical acetylsalicylic acid—more commonly known as aspirin (IBID). Recent research has shown that aspirin is a mast cell stabilizer and, when used under direct supervision of a physician, (and if tolerated by the individual) helps with flushing, brain fog, and bone pain (tmsforacure.org/treatments-2/medications-treat-mast-cell-disorders/).

Polyphenols are micronutrients that we get through certain plant-based foods. They're packed with antioxidants and potential health benefits.

Curcumin (turmeric) is a naturally occurring polyphenolic compound that has many pharmacological activities including inhibiting the activation and degranulation of IgE-mediated mast cells (Xian, Yue, Ye, et al, 2013). Anaphylaxis is an immediate IgE-mediated hypersensitivity reaction resulting from the sudden release of mast cell chemical mediators such as histamine and other chemicals. Curcumin is used traditionally to treat inflammation, gastrointestinal disorders, hepatic disorders, diabetic wounds, skin wounds, rheumatism, sinusitis, and other disorders. Scientific studies have

shown that curcumin inhibits histamine release from mast cells (Xian, Yue, Ye, et al, 2013).

Mast Cell Stabilizing Foods

Nutrition is often an area of our lives that is overlooked when it comes to healing and health. People usually have a basic understanding of “good” nutrition, for instance, that sugar is bad and we should eat salads and vegetables and not eat too many servings of red meat per week. Still, food isn’t typically presented as medicine.

Although we may have some knowledge about herbs and/or herb teas being medicinal, for example, there are teas in the supermarket made from senna that help with constipation; peppermint tea and peppermint are good for digestive upsets; rose hip tea is good if you need a dose of vitamin C; brewer’s yeast is full of B vitamins; and carrots have vitamin A which is good for vision. This only touches the surface of food as medicine.

Food as medicine for mast cell/mast cell activation spectrum related disorders is a two-tier awareness and application of knowledge. The first tier involves plastics and avoiding foods that have been in contact with plastics, as well as awareness and application of knowledge regarding the use and/or presence of chemicals in the environment such as cleaning products used in proximity to food items like flour, produce, and baking soda which can absorb chemicals and substances in the air (or become coated with chemicals and substances and the air and environment,) and where foods items are in relation to the laundry soap aisle. The second tier is making food item choices that are (1) low in histamine and (2) are mast cell stabilizing foods.

In a separate ebook, *Food as Medicine: Histamine Food List*, I have listed many food items and categorized them according to their having low, medium, or high levels of histamine in order to aid people in making low or lower histamine food choices. This is one way in which food can be used to help manage reactions.

The focus of this ebook, however, is on mast cell stabilizing foods. Having knowledge and awareness, and being able to apply it to one’s food choices by incorporating mast cell strengthening food items into one’s regular diet, is another way to support health and to manage reactions.



Flavonoids

Berries

- red, blue, and purple berries
- blueberries and cranberries (have quercetin and myricetin)
- blackberries and black grapes (high in epicatechin and catechin)

Tree Fruits

- bananas
- citrus fruits especially grapefruit (also lemons, limes, oranges)
- apples
- pears
- plums
- peaches
- apricots

Nuts & Beans

- dark beans (black beans and kidney beans)
- fava
- pinto snap
- walnuts (high in anthocyanidins)
- pecans (high in anthocyanidins)
- pistachios (high in catechins)
- cashews (high in catechins)
- soy beans

Vegetables

- particularly green and red veggies
- peppers (high in flavonols, flavones, quercetin, luteolin)
- tomatoes (high in flavonols, flavones, quercetin, luteolin)
- eggplant (high in flavonols, flavones, quercetin, luteolin)
- onions
- red onions (high in quercetin)
- green onions (high in quercetin)

Green Veggies

- celery (high in flavones apigenin and luteolin)
- artichokes (high in flavones apigenin and luteolin)
- snap beans (high in flavonols including quercetin, kaempferol, myricetin)
- okra (high in flavonols including quercetin, kaempferol, myricetin)
- broccoli (high in flavonols including quercetin, kaempferol, myricetin)

Spices

- dill (high in flavonols quercetin and isorhamnetin)
- parsley (high in apigenin and isorhamnetin)
- thyme (high in flavones luteolin)
- capers (high in flavonols kaempferol and quercetin)
- dark chocolate (high in catechins)
- rosemary (high in apigenin)
- basil (high in apigenin)
- coriander (high in apigenin)
- oregano (high in apigenin)

Beverages

- fruit juices (made from raw, unprocessed fruit which keeps many of the health benefits of the fruit, particularly if unfiltered, as do vegetable juices)
- tea (all types of black, red, and green teas—high in catechins and related flavonols)

Phenols

Fruits

- *the darker the fruit, the higher the phenol content*
- cherries
- citrus
- apples
- peaches
- apricots
- plums
- pears
- grapes

Vegetables

- yellow onions
- artichokes
- potatoes
- rhubarb
- red cabbage
- curly kale
- leeks
- cherry tomatoes
- celery
- broccoli

Grains (in descending order from most to least phenols)

- buckwheat
- rye
- oats
- barley
- corn
- wheat
- rice

Legumes

- peas
- beans
- soy beans have the greatest amount of phenols

Beverages (in descending order from most to least phenols)

- cider
- coffee
- soy milk
- regular milk
- cocoa
- red wine
- green tea
- black tea
- grapefruit juice

Polyphenols

Fruits

- blueberries/high bush blueberries
- strawberries
- raspberries
- citrus fruits
- dark grapes
- cherries
- apples
- dark plums
- blackberries

Non-Berry Fruits

- black currants
- plums
- sweet cherries
- apples

Vegetables

- all veggies provide polyphenols
- onions and potatoes have moderate to high amounts of polyphenols
- artichokes
- chickory
- spinach
- choose veggies with bright colors and eat a variety of colors

Grains, Beans, & Nuts

- rye
- whole grains
- soy beans
- soy tempeh
- soy flour
- tofu
- soy yogurt
- soybean sprouts
- black beans
- white beans
- peanuts
- hazelnuts
- walnuts
- almonds
- pecans

Beverages

- fruit and vegetable juices
- coffee (provides the most)
- green tea (second to coffee)
- black tea
- red wine

Curcumin (Turmeric)

from PUBCHEM, NIH, U.S. National Library of Medicine, National Center for Biotechnology Information

Curcumin is a natural component of the rhizome of turmeric (*Curcuma longa*) and one of the most powerful chemopreventive and anticancer agents. It's biological effects range from antioxidant, anti-inflammatory to inhibition of antiotenesis and is also shown to possess specific antitumoral activity.

- Curcumin has been shown to possess wide range of pharmacological activities including anti-inflammatory, anti-cancer, antioxidant, wound healing, and antimicrobial effects
- Curcumin reportedly has anti-allergic effects and can inhibit the release of histamine from mast cells
- Research demonstrates a protective role for curcumin during allergic responses to food antigens suggesting that frequent ingestion of this spice may modulate the outcome of disease in susceptible individuals
- Curcumin inhibits certain signaling events in mast cells (Syk kinase-dependent signaling events) and might thus contribute to it antiallergic activity. Therefore, curcumin might be useful for the treatment of mast cell-related immediate and delayed allergic diseases

Foods that contain curcumin:

- turmeric (*Curcuma longa*)
- curry powder
- mango ginger (*Curcuma amada*) – a member of the ginger family Zingiberaceae and closely related to turmeric

Additional Mast Cell Stabilizing Foods

Galangal

Galangal (*Alpinia Galanga*) is also called *Thai Ginger*. It is readily available at Asian markets. A study shows that it is extremely effective at stabilizing mast cells and preventing anaphylaxis:

Study: Hisashi Matsuda, Toshio Morikawa, Hiromi Managi, Masayuki Yoshikawa, "Antiallergic principles from *Alpinia Galanga*: structural requirements of phenylpropanoids for inhibition of degranulation and release of TNF-alpha and IL-4 in

RBL-2H3 cells," *Bioorganic & Medicinal Chemistry Letters*, Vol. 13 Issue 19, 16 October 2003, pp. 3192-3202.

Ginger

Ginger is a rhizome that inhibits allergic reactions. It has traditionally been used as an H2 receptor blocker but a 2009 study shows that it is also a mast cell stabilizer:

Study: Chen, Bing-Hung, et al, "Antiallergic potential of RL-2H3 cells of some phenolic constituents of *Zingiber Offcinale* (Ginger)," *Journal of Natural Products* 72.5 (2009) 950-953

Holy Basil

Holy Basil (*Ocimum Tenuiflorum*) is an herb in the basil family. It has a subtle flavor that is minty and mildly floral with a natural sweetness. It is an adaptogen with anti-anaphylactic, antihistamine, and mast cell stabilizing properties:

Study: G. Sridevi, P. Gopkumar, S. Ashok, C. Shastry. "Pharmacological basis for antianaphylactic, antihistaminic, and mast cell stabilization activity of *ocimum sanctum*." *The Internet Journal of Pharmacolog*: 2008, Vol.7 No.1.

Mangosteen

Mangosteens (*Garcinia Mangostana*) are a tropical fruit the size of small apples. Studies not only show that they lower the c-reactive protein inflammation marker and act as an antihistamine (H1), but that they also inhibit mast cell degranulation:

Study: Itoh, Tomohiro, et al, "Inhibitory effect of xanthenes isolated from the pericarp of *garcinia mangostant* L. on rat basophilic leukemia RBL-2H3 cell degranulation." *Bioorganic & Medicinal Chemistry* 16.8 (2008): 4500-4508.

Study: Chairungsrierd N., Furukawa K., Ohta T., et al, "Histaminergic and serotonergic receptor blocking substances from the medicinal plant *garcinia mangostana*." *Planta Med* (1996); 62: 471-472.

Mung Bean Sprouts

A recent laboratory study found mung bean sprouts (after 48 hours of growth) to provide significant protection against mast cell degranulation and histamine release due to their high flavonoid content”

Study: Li, Li, et al, “Anti-allergic effects and related active constituents of mung bean (*Vignaradiatus* Linn) sprouts.” *Food Science and Biotechnology* 25.2 (2016): 553-559.

Nettle

Nettle (*Urtica Dioica*) is typically used as a tea. It has been shown to be a potent antihistamine (H1 receptor) and a mast cell stabilizer:

Study: Roschek, Bill, et al, “Nettle extract (*Urtica dioica*) affects key receptors and enzymes associated with allergic rhinitis,” *Phytotherapy Research* 23.7 (2009): 920-926.

Pomegranate

Pomegranates (*Punica Granatum*) contain polyphenols and are higher in antioxidants than green tea. A study has shown that they act as mast cell stabilizers:

Study: Rasheed, Zafar, et al, “Polyphenol-rich pomegranate fruit extract (POMx) suppresses PMACI-induced expression of pro-inflammatory cytokines by inhibiting the activation of MAP Kinases and NF-B in human KU812 cells.” *J Inflamm (Lond)* 6 (2009): 1.

Tarragon

Tarragon (*Artemesia Dracumculus*) is one of the highest antioxidant food sources among herbs. A study shows that it stabilizes mast cells:

Study: Watanabe, Jun, Hiroshi Shinmoto, & Tojiro Tsushida, “Coumarin and flavone derivatives from estrago and thyme as inhibitors of chemical mediator release from RBL-2H3 cells,” *Bioscience, Biotechnology, and Biochemistry* 69.1 (2005): 1-6.



Acknowledgement

Thank you to the health professionals who have so generously shared their work online. This ebook would not exist without your dedication, knowledge, giving spirit, and deep compassion.

References for all cited information and food list information used in this publication are listed below.

References

Online:

<https://www.verywellhealth.com/what-are-mast-cells-1944889>

<http://mastcellmaster.com/publications.php>

<https://www.verywellhealth.com/ibs-4014702>

<https://www.britannica.com/science/antigen>

Theoharides, mastcellmaster.com/publications.php, "Mast cells: the immune gate to the brain," 1990

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4231949/>

<https://www.livescience.com/52524-flavonoids.html>

<https://www.livestrong.com/article/165497-list-of-high-phenol-foods/>

<https://scdlifestyle.com/2010/04/phenols-and-salicylates-what-they-are-and-why-it-matters/>

<https://tmsforacure.org>

<https://tmsforacure.org/treatments-2/medications-treat-mast-cell-disorders/>

<https://www.livestrong.com/article/73159-list-foods-flavonoids/>

<https://www.healthline.com/health/polyphenols-foods#berries>

<https://www.webmd.com/diet/supplement-guide-turmeric#1>

<https://www.livestrong.com/article/516883-what-are-the-health-benefits-of-phenols/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3936421/>

<https://www.drkarafitzgerald.com/2018/11/20/mast-cell-clinical-researcher-dr-theoharides/>

<https://alisonvickery.com.au/anti-histamine-foods/>

Print:

Moura, Sultan, Georjina-Lavialle, et al, "Evidence for cognitive impairment in mastocytosis: prevalence, features, and correlations to depression." (June 2012) PloS ONE, Volume 7, Issue 6: e39468. www.plosone.org

Finn, Walsh, "Twenty-first century mast cell stabilizers." British Journal of Pharmacology (2013) 170: 23-37

Xian, Yue, Ye, et al, "Curcumin inhibits the activation of immunoglobulin E-mediated mast cells and passive system anaphylaxis in mice by reducing serum eicosanoid and histamine levels." (2014). Biomolecules & Therapeutics 22(1), 27-34