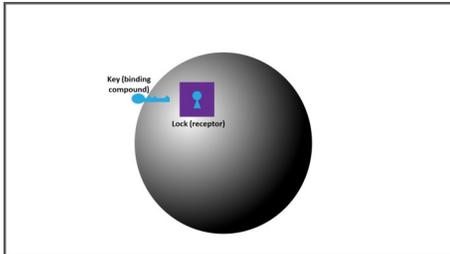


Food-Dependent Mast Cell Activation

Normal Mast Cell Activation

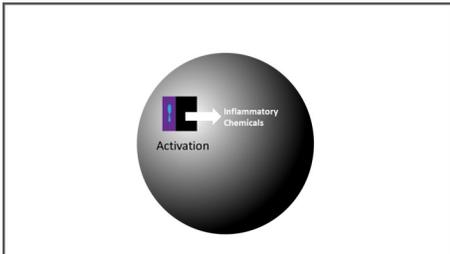
Mast cells are a type of white blood cell and are an essential component of the immune system. They are concentrated where germs enter the body (e.g. digestive, respiratory, urogenital systems & skin). They are like tiny water balloons filled with inflammatory chemicals. When a germ invades the body, mast cells activate, and the inflammatory chemicals (such as histamine) help to destroy the germ. Unfortunately, these chemicals cause some of the “sick” symptoms we feel while fighting an infection.

Mast cells activate when a compound binds to a receptor on its surface. Each receptor has a unique binding



In this video, I will show you what a mast cell receptor is and how compounds can bind to receptors to cause mast cell activation.

This ball represents a mast cell. Here's an example of a receptor on the surface. Receptors are kind of like the lock on a door. The binding compound is like a key that opens the door. The mast cell surface is covered with many different receptors and each receptor has a different binding compound.



The binding compound has opened the door and inflammatory chemicals come out – which is the process of activation.

Abnormal Mast Cell Activation

We've talked about mast cells activation as a normal part of the immune response, but mast cells activate for other reasons, such as IgE allergy and mast cell disease.

IgE Allergy

In the article, [IgE Food Allergy](#), we talked about food-specific IgE being a mast cell receptor. If the food protein (the binding compound) interacts with the IgE, the mast cells activate, leading to immediate food allergy symptoms.

Mast Cell Disease

Mast cell disease is an umbrella term for many conditions that involve excessive or abnormal mast cell activation. Please visit [The Mastocytosis Society](#) and [Mastocytosis Society Canada](#) for further details.

Mastocytosis: the patient has too many mast cells (the mast cells usually have other abnormalities). There are many variations of this rare disease.

Mast cell activation syndrome (MCAS): The patient has a normal number of mast cells, and they appear normally shaped, but they are easily activated. Each patient has their own unique set of triggers. Changes in the patient's environment may trigger symptoms. In addition, changes inside the body (e.g. hormones, disease state) can also trigger symptoms. Internal triggers can be especially frustrating because they are difficult to monitor or control.

Digestive system mast cell activation syndrome: This is not an official category, but hopefully it will be in the future. It is a possible explanation for why some patients experience frequent symptoms associated with eating. See role of diet in mast cell disease below for more details.

Mast Cell Disease Diagnosis

If you suspect mast cell disease, talk with your family doctor about a specialist referral. Mast cell activation syndrome has only been recently recognized and is very complicated, so most family doctors are not familiar with it.

[Specialist physician database](#) (primarily the US)

[Finding a doctor](#) (Canada)

Diagnosing this condition can be a long journey. Blood and urine tests measure “mast cell mediators,” which are the inflammatory chemicals (or their breakdown products) released from mast cells (e.g. N-methylhistamine, prostaglandin D2, tryptase). These mediators fluctuate and the blood and urine tests may not be taken at the exact right time to “catch” the elevated levels. Unfortunately, there is not a single test that gives a “yes” or “no” diagnosis.

Mast Cell Disease Treatment

Treatment is often a combination of medication and trigger avoidance.

Overall, the goal of medication is to stabilize the mast cells (less likely to activate) or to block the effect of the inflammatory chemicals after they are released. Mast cell patients are often sensitive to medication and supplements. The medication fillers, rather than the active ingredients, may be the problem. In this case, a compounding pharmacy can help. See [Medication](#) for more information.

Trigger avoidance is an essential component of managing mast cell disease. For most patients, this starts before having a confirmed diagnosis. Each person has their unique set of triggers. Common external triggers include:

- diet, medication/supplements,
- inhaled substances (pollen, chemicals, etc.),
- physical activity, temperature changes,
- vibrations,
- emotional/physical stress. Mast cells have receptors for stress hormones, making a

person with mast cell disease more sensitive to stress than most people.

Triggers are often inconsistent or cumulative and can be a challenge to identify. For example, your diet may be more problematic during the pollen season. [Symptom and Trigger Journals](#) can help you better understand your external triggers.

In addition to external triggers, patients are often triggered by internal changes that cannot be measured or controlled - such as hormone, disease state, infections, etc. Patients often get frustrated when they don't know why their symptoms flared (e.g. there was not an obvious external trigger). In this case, it may be an internal trigger.

Symptoms and Inflammatory Chemicals

This is a simplified discussion of a complicated topic!

Mast cell disease symptoms vary a great deal from patient to patient, and within the same patient over time. Therefore, it is difficult to write a simple list of symptoms and the disease is difficult to recognize. Patients are often undiagnosed for many years. This inconsistency also makes it challenging to cope. I've listed some reasons why symptoms are inconsistent. Hopefully, understanding some of the “why's” will help you work towards accepting this uncertainty.

Piecemeal activation (degranulation): Mast cells contain many different inflammatory chemicals, each with a different effect on the body. During activation, mast cells may release all of their chemicals or just certain ones (piecemeal degranulation). Symptoms depend on what chemicals were released.

Chronic (continuous) vs. acute (sudden) symptoms. Chronic symptoms likely result from an ongoing release of inflammatory chemicals. Sudden symptoms likely result from rapid activation of many mast cells. A patient may experience one or both type of symptoms. The same trigger may

cause chronic symptoms on some days and acute symptoms on other days.

Location of activating mast cells: The location of the activating mast cells will have a large impact on symptoms. Also, the degree to which the inflammatory chemicals get into the blood stream will determine the likelihood of multi-organ symptoms.

Cumulative triggers: Response to a trigger often depends on what else is going on. For example, patients may be more sensitive to diet triggers during the pollen season or when they are under stress.

Differences in tissue receptors: Inflammatory chemicals exert influence by interacting with receptors on the tissues. For example, histamine travels through the blood and exerts its effect through four different receptors (H1, H2, H3 and H4). The impact of inflammatory chemicals may depend on the patient's unique distribution of receptors.

Role of Diet in Mast Cell Disease

Many patients with mast cell disease report that diet is a symptom trigger.

Many patients can eat a regular diet. I talk with many clients that are following a modified diet, because they think they should, but they don't really know if it is making a difference. Following a treatment protocol brings a sense of control when you suffer from an illness with a lot of uncertainty. Diet is one of the few things that we have control over, so following a diet gives people a sense of "doing something." Unfortunately, [food restrictions may lead to further sensitivity](#).

If you would like to try dietary changes, it is important to systematically experiment and continue restrictions only if you notice a definite benefit. The low histamine diet is a popular diet in the mast cell community. Please see the [Practical Guide to the Low Histamine Diet](#) for further information.

If you experience symptoms with every meal, the process of eating and digestion might be the trigger, rather than specific foods. Pressure on the skin can cause mast cell activation (dermatographia) in some patients, so it is possible that internal pressure does the same thing. In this case, searching for a diet to improve symptoms may not help. Medical management to stabilize the disease is necessary.