

The Auto-immune System, a layman's definition.

The following has been produced by/for The Crawley Gluten Free Group. It is (meant to be) a layman's explanation of the Auto-immune System, what it is and how it functions and how important various parts of our body are to maintaining this immunity. These various statements and comments have been extracted from a variety of articles, the names of the Authors of these publications are shown against each item.

-‘The immune system is one of the most complex systems in the human body’.
“Joseph Master Herbalist“.

-Auto-immune diseases are becoming more and more prevalent and they are hard to treat. “Healing with Nutrition”. The reason for this, is the increase in toxins and pollutants that are infiltrating our bodies and entering our immune systems, or it may be due to increasing levels of sterility, in our environment..

- The celiac disease is a lifelong condition of the small intestine, caused by the bodies reaction to the proteins gliadin and glutenin. The body inappropriately responds to gliadin, cross reacting with the enzyme tissue transglutaminase, causing a cross reaction with the immune system. This response actually attacks the lining of the small intestine, causing an inflammatory reaction, which leads to the flattening of the lining of the small intestine, thus stopping the absorption of nutrients. “Herbal pills”.

Is this all true?, or will we one day obtain a cure?, CGFG November 2009

My wife was diagnosed, as having the Coeliac Disease, in 2006. It was then that we discovered that the Coeliac Disease results in the body attacking itself, and damaging the auto-immune system. So not having any medical background, but having an enquiring and systematic mind, we decided to explore, what has been written and published about the auto-immune system, trying to find out why it is so important to our daily lives.

- So what exactly is the auto-immune system?.
- Why does Gliadin/gluten do this to our bodies?.
- What does it actually attack?.
- Is it protecting our bodies?, or destroying them?.

This article is our understanding of what the celiac disease has done to the body, what has been affected and then as a person having the celiac disease, how important it is to remain strictly gluten-free.

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What is the immune system?

So what is this immune system. It is very complex, composed of lots of lymphatic vessels and organs throughout the body. The thymus gland, the spleen, adrenals, lymph nodes. Tonsils, adenoids, white blood cells, specialised cells and serum factors.

What is it's function?

The primary function is to protect the body against various diseases or infections, by functioning as an internal defense mechanism. By determining what type of bacteria has entered the body, through the mouth, nose, food or water in any part of the body, and responding rapidly, to ensure that the body is not overwhelmed, by an excess of these micro-organisms.

The immune response to bacteria, is to produce a group of white blood cells, which surround the intruders and ensure they do not spread.

The immune system has a memory, similar in many ways to a computer data base, in which it can store the intruders fingerprints. If it has encountered the virus before, it has the ability to quickly recognise the virus and render it harmless. Immunizations use the same mechanism, it introduces a weakened version of the virus, so that a specific anti-body can be produced to protect against a further invasion, of that illness, (this process can take up to 14 days to become fully effective).

With a cold infection, the initial symptoms appear within 48 hours, the immune system generates specialized white blood cells, known as macrophages, which attack the pathogens (intruders) and swallow them up. Unfortunately these viruses are continuously changing their appearance, thus avoiding immediate immune system reaction.

The important glands in your immune system.

The Thymus Gland.

The major gland is the thymus gland, which is made up of 2 soft pinkish lobes, lying just below the thyroid gland, in the upper part of the chest cavity, above the heart. The thymus gland is responsible for the production of T-cells (T-lymphocytes), this is the white blood cell, which provides the resistance to infections, it also releases several types of hormones, which regulate the immune function.

The Lymphatic System.

The lymphatic system has a major role in the immune system, by forming white blood cells that manufacture anti-bodies which attack the harmful bacteria. These white blood cells circulate throughout the body and monitor the bodies functions, maintaining its stability, by providing nutriment (nourishment) to every cell in the body.

The human body consists of cells which are separated by fluid, this space (interstitial space), accounts for about a sixth of the body and the fluid (interstitial fluid) which occupies this space, flows into the lymphatic vessels and becomes the lymph.

These lymphatic vessels run parallel to the arteries and veins, draining waste products from tissues and transporting the waste to the lymph nodes, which filter and destroy bacteria. Lymph nodes are located around the body, at the neck, protecting the head, and at the thighs, protecting the legs and the genitals. The presence of bacteria may cause these lymph nodes to swell, showing the body is trying to heal itself.

The **spleen** is the largest mass of lymphatic tissue in the body, it destroys bacteria and worn out red blood cells, it also is a form of blood reservoir, which can release its stored blood, in the case of a hemorrhage.

The **liver** produces the majority of the lymph in the body, it is especially good at filtering bacteria and destroying this bacteria using Kupffer cells (only found in the liver).

The **adrenal** glands also play an important role, by secreting various types of hormones, which in turn activate parts of the immune system.

The white blood cells are in the lymph nodes, the spleen, thymus and the tissue fluids and are responsible for defending the body against disease. They are outnumbered 500 to 1 by the red cells and are in 2 groups, granular and non-granular.

White blood cells are classified as granular or non-granular.

Granular cells, often referred to as Stem Cells, are formed from the same basic cell as bone marrow. These white blood cells engulf and destroy bacteria and secrete histamines, which in turn activate allergic mechanisms. Some of these cells are transformed into T-cells, in the thymus gland, while B-cells conversion occurs in the bone marrow.

B-cells form anti-bodies that bind themselves onto harmful bacteria and destroy it. These are the immune systems, most effective killers. Once this anti-body has been formed, it can clone itself, and is then available to maintain a healthy body

There are many ways the body defends itself, interferon was recently discovered, as found in T-cells and is the first line of defence, leaving healthy cells sufficient time for the immune system to react to a bacterial invasion.

So what is in Gluten to cause these in-balances in the T-cells.

So the T-cells are guarding your body and are telling the immune system, whenever it detects that a foreign intruder has entered any part of your body, the T-cells then try to determine which is the appropriate anti-body, your immune system should release, to be circulated and destroy the invader.

Unfortunately gliadin causes confusion amongst the T-cells and these confused T-cells basically start attacking your own body, by wrongly recognising gliadin as an invader.. Called “An Auto-immune System Disorder”. (organic hope.com)

Continuing with what is known

Th1 and Th2 cells.

Th1 and Th2 (lymphocytes) cells are normally in a constant state of balance, like a see-saw, when one is increased the other decreases.

Th1 cells (cytokines) tend to produce the pro-inflammatory responses, killing parasites, (foreign pathogens), interferon is the main Th1 cytokine. But excessive pro-inflammatory response can lead to tissue damage, so to counteract this Th2 is produced, this well balanced Th1 and Th2 response is the optimal scenario for humans, but imbalance results in the autoimmune disease.

(Science commentary. bmj.com).

September 2002 The mechanisms are not fully understood!

In 2002 “The Stanford University Medical Center, team of investigators believed they may have discovered the cause and a potential (possible) treatment for the Coeliac Disease“. (eurekaalert.org)

Researchers found that the culprit to the Coeliac Disease was a fragment of gluten, called gliadin. This fragment is resistant to digestion and is responsible for the intestine-damaging inflammatory response, experienced by celiac patients.

Most proteins get broken down by the body’s digestive system, into amino acids The fragment was found to be rich in amino acid proline, (proline helps the body break down proteins, in order to create healthy cells). But these fragments were resistant to further digestion and contained even smaller fragments, already known to induce human T-cells to attack the intestine. However the researchers reasoned that a peptidase (an enzyme which breaks down proteins) could be introduced to break down the gliadin fragment, thus rendering it harmless, known as peptidase supplementation, which may eventually offer a treatment, for the Coeliac Disease.

Research and drugs under testing or at various phases

As at the end of 2009, there are still no therapeutic products, on the market, for the Coeliac Disease, various studies have commenced or are progressing, through various phases, these are namely:-

Phase I This is the stage where a drug is tested out on a small number of people.

Phase II A larger group of people are now selected and tested for side effects and all aspects of safety.

Phase III Larger studies, designed to test if the drug/treatment is effective.

Phase IV The drug is now on the market, so its long term effects are now monitored.

AT1001 Manufactured by Alba Therapeutics. It controls the bodies production of Zonulin and opens the junctions between cells, in the area of the intestinal mucosa. Project is now in Phase II.

ALV003 Study Phase I, commenced in February 2008, 36 persons taking part in the USA. The aim of the drug is to break down the gluten into minute fragments. Phase 2 commenced with 110 patients receiving the treatment, results are due Mid-2010.

STAN1 A Placebo Enzyme. Testing Phase I, commenced in August 2008 with results due in February 2010.

CCX282-B Recruitment of 436 patients in 17 countries was completed during 2008. The drug is aimed at reducing the inflammatory effect of T-cells, on the immune system. The testing commences with a 12 week induction period, followed by a 36 week maintenance period. Project now in Phase II.

The Coeliac Disease Conclusion

The disease has been known about for centuries.

Gradually the scientists/researchers are homing in on exactly why Gliadin causes the T-cells to create their own T-cell havoc, but from all the available literature, these is still a long way to go.

It is a very complex subject, from a layman's point of view, the immune system has so many possibilities to not function correctly, that finding a solution, which in turn doesn't create another problem, is the problem.

Will it ever be solved, the researchers seem to think there will be a solution, but one wonders, with so much being spent on producing new varieties of Gluten-Free food products, in whose interest is it to solve the problem. So we may well finish up like the petrol motor car, what will happen to the oil producers, will they allow the petrol engine to be totally replaced.

So the final conflict may well be between the Gluten-Free Suppliers and the Medicine Drug Companies, who has the most to gain?, who has the most to lose? and what about the patients?. At the moment it would appear to be anyone's guess. Will it ever be solved or never solved?, probably not in my lifetime.

This short article was written for The CGFG, after spending many, many, hours/weeks/months researching the subject of living gluten-free. Items have been extracted from the Internet, asking Dr.Google lots of questions and trying to make sense of some of the answers. We don't know if it helps you to understand a little bit more, about the Coeliac Disease, if it does then we have achieved our objective.

For the Crawley Gluten Free Group www.glutenfree-crawley.org.uk