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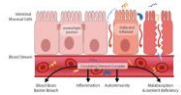
MORE ABOUT ZONULIN



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Zonulin For Testing Leaky Gut

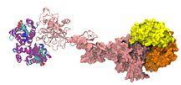
- There is now a test for zonulin that we can access
- So understanding more about it may be helpful for you and clients
- It is important to understand this is just a piece of the puzzle that has been discovered
- It may or may not be the only factor or chemical in play with intestinal permeability or leaky gut



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Zonulin

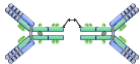
- Zonulin is a protein that is released as part of an immune response that regulates both the movement of fluids and large molecules
- Zonulin is also known as prehaptoglobin 2 (preHAP2)
- Haptoglobin is a hemoglobin binding protein that can modulate immune response
- It is usually inactive but as a protective mechanism - zonulin allows fluids to flow into the intestines to "flush out" the toxin or antigen – diarrhea may occur



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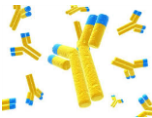
Zonulin

- The integrity of the gut lining plays a key role in determining the degree of inflammation that the body experiences
- Zonulin can be released from intestinal cells, it locks on to receptor sites on the surface of the cell and de-couples the proteins that are keeping the tight junctions "tight" which opens the junctions
- This allows an antigen or a food molecule to enter into the body which set off both SigA and IgG reactions
- Leads to food sensitivities and the more the food is consumed the more sensitivity

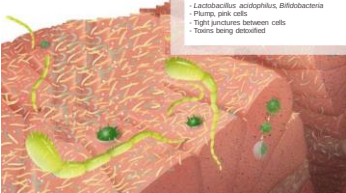
A diagram showing a zonulin protein molecule, which is a dimer with two Y-shaped subunits connected by a central linker. The subunits have blue and green domains.

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- Zonulin open and closing the gut is a normal,fluid process
- It is important to remember that zonulin open the gut allows for fluids to flow the intestinal tract to flush out toxins
- Therefore, having IgG antibodies (when tested) does not confirm leaky gut
- Poor digestive function can lead to partial protein molecules which can slip into the bloodstream during a normal process of the gut opening and closing

A diagram showing a cluster of zonulin protein molecules, which are Y-shaped with blue and yellow domains.

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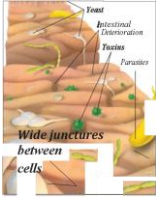
A diagram of a cross-section of the gut lining. It shows a layer of pink cells (enterocytes) with green bacteria (Lactobacillus acidophilus and Bifidobacteria) on the surface. The cells are connected by tight junctions, and some toxins are shown being detoxified.

- Abundant healthy bacteria
- Lactobacillus acidophilus, Bifidobacteria
- Pump, pink cells
- Tight junctions between cells
- Toxins being detoxified

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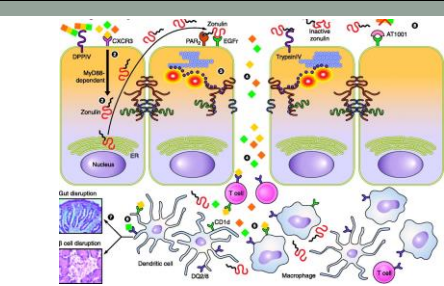
Leaky Gut

Atrophied
Unhealthy
Cells



The diagram illustrates a cross-section of the intestinal lining. On the left, cells are labeled 'Atrophied Unhealthy Cells'. On the right, the junctions between cells are labeled 'Wide junctions between cells'. Other labels include 'Tight Junctions', 'Paracellular', and 'Transcellular'.

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The diagram shows a cross-section of the gut wall. The top part shows the intestinal lumen with various molecules (LPS, PAMPs, DAMPs) and cells (Zonulin, T cells, B cells, Macrophages). The middle part shows the gut wall with cells (Zonulin, T cells, B cells, Macrophages) and the gut barrier. The bottom part shows the immune response with labels like 'Gut disruption', 'B cell elongation', 'Dendritic cell', 'DAMP', 'Macrophage', and 'T cell'. A small text 'al 2011' is visible in the bottom right corner.

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Zonulin



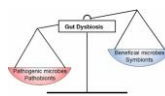
The diagram shows a Y-shaped molecule, likely representing an antibody or a specific protein.

- Once zonulin has opened the gut – large molecules can pass – inflammation occurs and IgG antibodies can form
- If these are food molecules, then food intolerances occur and once this happens consuming the food produces more inflammation and more IgG antibodies.
- Issues linked to leaky gut: chronic inflammation and pain, heart failure, depression, food and chemical sensitivities, CFS, Yeast overgrowth, autoimmunity, schizophrenia, certain cancers- brain, breast, lung, ovarian and pancreatic

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Causes of Leaky Gut - Dysbiosis

- Cause of Dysbiosis
- Diet – processed foods
- Hormones – including estrogen, testosterone and progesterone as well as thyroid hormones
- Antibiotics, corticosteroids
- Infections
- Stress
- Chemotherapy
- Radiation



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Imbalances

- Dysbiosis
- Malabsorption
- Bacterial and yeast overgrowth
- Immune response and issue with integrity of the gut lining
- Further degeneration of the gut lining
- More food sensitivities

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Obesity

- Higher zonulin levels are observed in those with Type 1 diabetes (and their family levels – not as high) than controls
- Several studies have found higher levels of zonulin as well as several chemical markers in the blood in people who are obese as compared to those of normal weight
- Also, higher zonulin are also associated with insulin-resistance in obese subjects which also links it to Type 2 diabetes



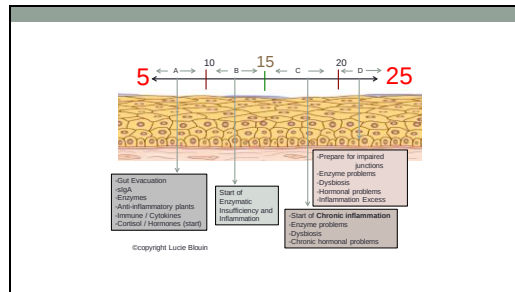
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Zonulin

- For asymptomatic Crohn's sufferers, "leaky gut" (therefore a Zonulin increase) occurs up to 1 year before a relapse
- IBD – not a lot has been studied but small intestine "leaky gut" has been linked to the period preceding the outbreak of the colitis patches
- Learn more about zonulin – free webinar on the CAHN-Pro site:
<http://cahnpro.org/pages/free-webinars>



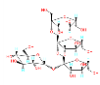
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Lowering Zonulin

- Reading the research – no one seems to make the connection that the gut bacteria is playing the regulatory role
- However, one study of athletes found probiotic supplementation lowered slightly elevated zonulin levels to normal
- Another study found that probiotics lowered infection, sepsis and zonulin levels in those having colectomy surgery
- Other studies have show similar results
- Inulin-enriched pasta was fed to 20 male subjects whose zonulin levels were stimulated and significantly lowered zonulin and decreases leaky gut – however they were healthy males



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So what should we make of all this?

- We know there is some info about probiotics and prebiotics lowering zonulin
- The problem is the person – how bad is the individual's situation
- Butyrate improves intestinal permeability and lowers inflammation – could it lower zonulin?
- Same with glutamine – repairs the gut lining – could it also lower zonulin?
- Zonulin is just one mechanism for leaky gut that has been identified – there may others so we have to wait and see



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In the meantime...

- Explain to the client the leaky gut issue and depending on their issues – that it will take time
- The gut protocol does not change – probiotics, fermented foods, prebiotics, glutamine and butyrate supplements are all options – what has to change is the clients expectations
- Zonulin testing can help measure progress:
https://www.fluidsiq.com/human_testing.php?lang=en
- This could help the client stay the course

