

OBESITY, DIABETES AND CHRONIC FATIGUE

In the metabolic energy supply to blood cells, glucose absorption is normally regulated by the pancreatic hormone, insulin, which is insufficiently produced in people with diabetes type I, or produced in excess in diabetes type II. If the immune response to the food proteins is excessive, molecules such as tumour necrosis factor- α , TNF- α , are produced in high enough concentrations to inhibit the linkage of glucose to cells via insulin. Consequently, glucose levels increase in the blood, and the glucose is dumped into fat cells. The build up of blood sugar stimulates the pancreas to make more insulin causing insulin resistance and diabetes type II. The energy in the fat cells is not burnt up and a cruel cycle is established where the body seeks more fat leading to obesity. (See Figures 4 & 5) The body needs energy and, if the cytokine flux inhibits glucose metabolism, the body's efficiency is decreased and exhaustion creeps in. The inflammation caused by the excessive cytokine flux sends messages to the human brain triggering feelings of tiredness and exhaustion.

AUTISM AND ADHD

Extensive research has shown a link between intolerance to gluten/casein and autism/ADHD. The current theory is that the immune response causes 'gates' in the gastrointestinal tract to remain open, and this allows small peptides called gluteomorphin and casomorphin to escape and travel to the brain to cause the disease state. Biohawk's ginger spices reduce the risk of the intolerant reaction, and therefore has the potential to reduce the risk of these diseases.

ALLERGIES:

Here we are considering food allergies caused by proteins. However, allergens from pollens have similar structural features and will stimulate a similar response. When an allergen reacts with the immune system's T-cells, the released cytokines stimulate B-cells to release Immunoglobulin-E (IgE) that binds to another cell called a mast cell. The allergen has to have a structure that allows it to crosslink two IgE molecules attached to mast cell receptors. This cross-linking initiates the release of a range of chemical compounds such as histamine and heparin, cytokines and enzymes such as tryptase. These in turn cause the symptoms associated with allergies. Biohawk's ginger spices have the potential to specifically target the allergenic proteins preventing them from stimulating the immune system and the allergic response.

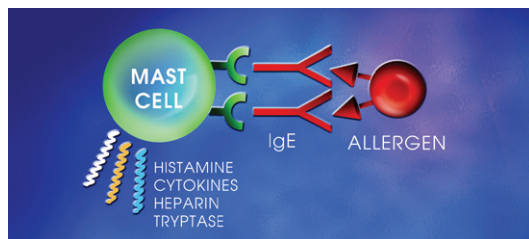


Figure 6

INVENTOR OF THE TECHNOLOGY

Cliff Hawkins (BSc PhD DSc) previously held the positions of Principal, University of New England-Armidale, and Pro-Vice-Chancellor (Biological Sciences) and Professor of Chemistry at the University of Queensland. He has also worked at the John Curtin School of Medical Research at the Australian National University, the Oersted Institute at the University of Copenhagen, and in Departments of Chemistry at the Massachusetts Institute of Technology, the University of California Davis and Berkeley, and the University of Virginia. His international studies have been recognized by the award of the USSR Academy of Science Mendeleev Medal and the Royal Australian Chemical Institute Inorganic Award. He has established Biohawk to develop natural food products that specifically break down proteins that cause food intolerance and allergies, and that coat infectious micro-organisms and are associated with the infective process and the damaging immune response to the infection.

Note: Biohawk's RELIEF (powder), DIGESTEASY (solution to be kept cold) and BAKE AID (powder) are made from a special blend of ginger spices from the Zingiberaceae family and are designed to digest specific types of proteins. They are not sold to treat disease and they have not been submitted to the Therapeutic Goods Administration for licensing or registration for the treatment of any particular disease.



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NATURE'S BIOLOGY PROVIDING SOLUTIONS FOR

food intolerance and allergy

Biohawk's approach is to use common plant foods designed by nature to remove from other foods and from micro-organisms proteins that cause food intolerance and allergy and other serious diseases, and to repair life's damages to our bodies.

AID TO DIGESTION

Some proteins in foods we commonly eat have multiple amino acid sequences that enforce 3-dimensional structures on the proteins that prevent our digestive systems from breaking down the proteins so they can be metabolized efficiently. This limits the nutritional value and the palatability of the food. As plants use these types of proteins to encapsulate and protect from predators the starch or oil they need as an energy source for germination, our failure to break down these proteins in our gastrointestinal tract means the nutritional value of the food's starches and oils is also reduced and the protein, the starches and the oils proceed to our large intestine.

Biohawk has identified food crops that are designed by nature to aid in the digestion of these special proteins that are found in plants in general and in connective tissue of meat. Biohawk's current products, RELIEF, BAKE AID and DIGESTEASY, are based on the rhizomes of ginger spices from the family Zingiberaceae, used for millenia in Asia to aid digestion, with the efficacy of the spices optimized and standardized following many years of research and development. All people as well as other animals can benefit from the markedly improved nutritional value and palatability of the food they eat if they take Biohawk's special blend of ginger spices as a daily tonic and/or they use the spices as an ingredient in their food preparation.

FOOD INTOLERANCE AND ALLERGY

When these digestion-resistant proteins have amino acids in the 'multiple amino acid sequences' that are able to stimulate the immune system, the body now sees these proteins as a potential threat (an 'antigen'). For those people with particular genes, these proteins can cause food intolerance and allergy, and lead to very serious autoimmune diseases. However, the symptoms are only recognizable after their immune system is sensitized.

Foods made from, for example, cereal grains, milk, soy, lupins, eggs, fish and peanuts, contain higher amounts of these special

proteins. Some people suddenly realize these foods are causing them health problems. In Australia, over 30% of the population has the genes to experience food intolerance and allergy. Some allergies become rapidly life-threatening, such as peanut allergy, but other allergies and intolerances are more difficult to diagnose because the symptoms take time to develop. Extensive scientific studies worldwide have established a direct link of food intolerance to a wide range of diseases such as obesity, diabetes, rheumatoid arthritis, chronic digestive disorders, forms of dermatitis, psoriasis, autism, ADHD, depression, schizophrenia, chronic fatigue syndrome, and cancers with primaries in the gastrointestinal tract.

People with the genes for food intolerance and allergy show symptoms when they eat the food after their immune system has been sensitized by:

- repeated significant intake of the food that causes the intolerance or allergy
- intensive exercise in conjunction with the intake of the food, for example triathletes eating 'carbs' prior to training or competing
- infection with a virus or bacterium which has surface proteins that contain similar amino-acid immunogenic sequences that cause these proteins' resistance to digestion and ability to stimulate the immune system
- vaccination with viruses or their immunogenic proteins (Note: this is not a sufficient reason for refusing vaccination to a serious disease but it is essential that people carefully analyze any consequent reactions to a vaccination and seek medical advice if symptoms of food intolerance/allergy or other allergies emerge)
- stress.

The symptoms depend on the particular food intolerance, but commonly irritation in the throat or somewhere in the gastrointestinal tract, especially 'gut' pain, bloating, diarrhoea, constipation, change in 'personality', fuzzyness in the head, migraine, or a skin irritation. Often the food intolerance is only identified when symptoms of an autoimmune disease such as diabetes or rheumatoid arthritis emerges or if a person is very thin and cannot put on weight and endoscopy shows trauma to the small intestine (coeliac disease) or a female puts on weight on her posterior or a man develops a 'beer' gut and exercise and controlling the quantity of food eaten does not lead to a reduction in the condition. Some food allergies are far more serious with anaphylaxis and a sudden drop in blood pressure.

Basically, mankind was not designed to digest some of the food it consumes. Some populations do not have the 'intolerance gene' now because they have been exposed to the food for some tens of thousands of years, and 'natural selection' over this long period has removed those with the gene from the population. For others, the introduction of these foods into their diet has been much more recent. A much higher percentage of these people are susceptible to food intolerance. A good example is gluten intolerance. People of Celtic, Scandinavian, Asian, and 'indigenous' races were exposed to wheat much later than

people from the Middle East, and a higher proportion have the genes responsible for food intolerance. As they have changed their diet to include more 'western' wheat-based food, they have experienced the damaging consequences.

HOW DOES BIOHAWK'S SPECIAL BLEND OF GINGER SPICES HELP?

The ginger spices are able to break down the above digestion-resistant immuno-genic proteins specifically at the amino-acid sequences that cause food intolerance and allergy. This prevents the immune system reacting adversely to the food, allows the food's protein, starch and oil to be more efficiently metabolized early in the digestive system and not to proceed into the large intestine undigested where bacterial fermentation may cause an increase in acidity, a change in the bacterial culture, the release of toxins and a change in the fatty acids absorbed.

HOW DOES THE IMMUNE SYSTEM REACT TO THE FOOD PROTEINS?

Digestion-resistant immunogenic food proteins are seen by the immune system as foreign 'antigens' that need to be destroyed. They are consumed by white blood cells called 'antigen-presenting cells' or APC. If the food intolerance gene is present, part of the antigen is expressed on the surface of the APC, and the immune system mounts a defence to destroy the problem. (See Figures 1 & 2) Unfortunately, the immune system's response can be so great that it can damage the host.

For the immune response to happen, the APC needs another white blood cell called a T-helper cell with a receptor protein on its surface to bind to the antigen. The APC can stimulate bone marrow stem cells to make such a T-cell, but if there are already high concentrations of T-cells to bind to the antigen, then the immune response can be large enough to produce clinical symptoms. If not, the clinical response is not detectable.

The interaction of the antigen on the APC with the receptor on the T-cell stimulates the release of molecules called cytokines. These communicate with other white blood cells called B-cells that in turn produce antibodies such as immunoglobulin-G (IgG) for the intolerance reaction (and IgE for the allergic reaction). The IgG binds to new antigen and the combination is removed by other white blood cells. This is the normal defence mechanism for the immune system, but if it is over sensitized, health problems can follow.

HOW DOES THE IMMUNE RESPONSE DAMAGE THE BODY?

The IgG molecules are not totally specific for a particular antigen. They recognize proteins with similar structures that belong to the body's own tissues causing parts of the body to be inflamed and destroyed. This is called an autoimmune response. For example, with gluten intolerance the lining of the intestine can be damaged because it has a protein that has structural features similar to the gluten proteins causing serious inflammation, ulceration, and irritable bowel syndrome (See Figure 3). If the release of the cytokines is excessive, these molecules can bind to cell receptors involved in essential metabolic and other functions, and block these functions. (See Figures 4 & 5)

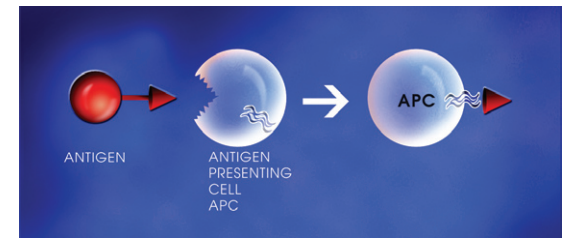


Figure 1

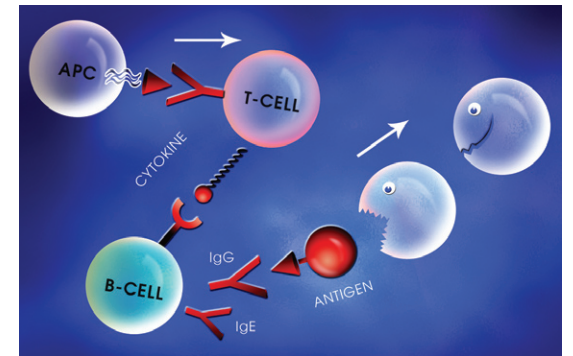


Figure 2

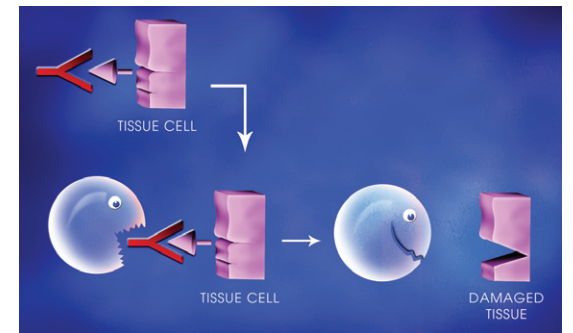


Figure 3

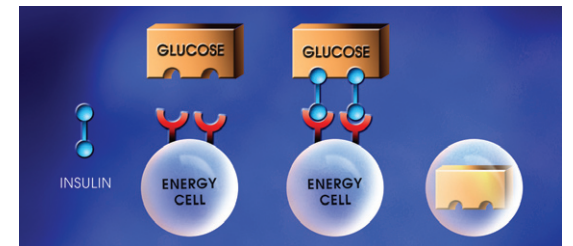


Figure 4

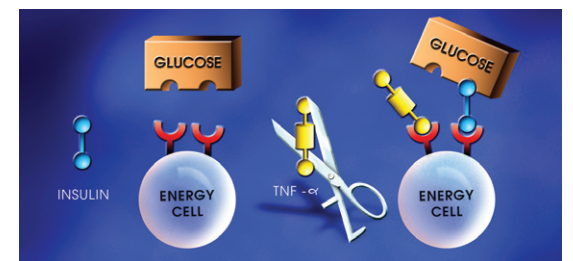


Figure 5