The Biotoxin Pathway

Body acquires biotoxins or toxin-producing organisms from food, water, air, or insect bites

Biotoxin (HLA susceptible)

Surface ("Toll") receptor

Fat Cell

In genetically susceptible people, biotoxin binds to fat cell receptors, causing continuing, unregulated production of cytokines

Capillaries

High cytokine levels in the capillaries attract white blood cells, leading to restricted blood flow and lower oxygen levels. Reduced VEGF leads to fatigue, muscle cramps, and shortness of breath (may be overridden by replacement with erythropoietin)

Increased Cytokines

Immune system symptoms

Patients with certain HLA genotypes (immunity-related genes) may develop inappropriate immunity. Most common are antibodies to:
-- Myelin basic protein (often from fungal biotoxins, affects nervous system functions)
-- Gliadin (affects digestion)
-- Cardiolipins (affects blood clotting)
The "complement" alternative immune pathway may be triggered (detectable as an increase in levels of the proteins 3a, C4a).

Biotoxin (HLA susceptible)

Nerve cell

Biotoxins have direct effects, including impairment of nerve cell function. One result is poor performance on contrast sensitivity test

Increased Cytokines

Increased Leptin

Excessive cytokine levels can damage leptin receptors in the hypothalamus

Fat cells then produce more leptin, leading to obesity (which doesn't respond to exercise and diet)

Leptin receptor

Hypothalamus

VIP

AVP

Damaged leptin receptors lead to reduced production by the hypothalamus of MSH, a hormone with many functions

Cytokine-related symptoms

High levels of cytokines produce flu-like symptoms. Headaches, muscle aches, fatigue, unstable temperature, difficulty concentrating. High levels of cytokines also result in increased levels of several other immune-response related substances, including TNF, MMP-9, IL-1B, and PAI-1. MMP-9 delivers inflammatory elements from blood to brain, nerve, muscle, lungs, and joints. It combines with PAI-1 in increasing clot formation and arterial blockage

Biotoxin (not HLA susceptible)

Removal from the body

In most people, biotoxins are either removed from the blood by the liver or attacked by the immune system, broken down, and excreted harmlessly. In people who don't have the right immune-system genes, however, biotoxins can remain in the body indefinitely

Reduced MSH

Sleep disturbance

Production of melatonin is reduced, leading to light, non-restorative sleep

Chronic pain

Endorphin production is suppressed. This can lead to chronic, sometimes unusual, pain

Gastrointestinal problems

Lack of MSH can cause malabsorption in the gut, resulting in diarrhea. This is sometimes called "leaky gut" and resembles (but is not) celiac disease. Patients must avoid gluten, whey, and amylose

Prolonged illness

White blood cells lose regulation of cytokine response, so that recovery from other illnesses, including infectious diseases, may be slowed

Resistant Staph bacteria

Colonies of Staph bacteria with resistance to multiple antibiotics may develop in mucous membranes. The bacteria produce substances that aggravate both the high cytokine levels and low MSH levels

Changes in cortisol and ACTH levels

The pituitary may produce elevated levels of cortisol and ACTH in early stages of illness, then drop to excessively low levels later. (Patients should avoid steroids such as prednisone, which can lower levels of ACTH)

Reduced ADH

Reduced MSH can cause the pituitary to produce lower levels of anti-diuretic hormone (ADH), leading to thirst, frequent urination, and susceptibility to shocks from static electricity

Reduced sex hormones

Reduced MSH can cause the pituitary to lower its production of sex hormones

Stage1: Biotoxin effects

Stage2: Cytokine effects

Stage3: Reduced VEGF

Stage4: Immune effects

Stage5: Low MSH

Stage6: Resistant Staph bacteria

Stage7: Pituitary hormone effects

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Get tested at www.biotoxin.info

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