shoemaker
DIAGNOSIS • TREATMENT • RESEARCH • EDUCATION • GENOMICS

The Biotoxin Pathway

In genetically susceptible people, biotoxins bind to pattern receptors, causing continuing, unregulated production of cytokines.

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

Biotoxin (HLA susceptible)

Surface Receptors (Toll; C-type lectin; mannose & others)

Dendritic Cells

HLA-DR

Capillaries HIF

High cytokine levels in the capillaries attract white blood cells, leading to restricted blood flow, and lower oxygen levels. HIF stimulates VEGF and TGF B-1. Reduced VEGF leads to fatigue, muscle cramps, and shortness of breath (may be over-ridden by replacement with erythropoietin). TGF B-1 changes cell type and interacts with Treg cells.

Increased Cytokines

Immune System Symptoms

Patients with certain HLA genotypes (immune response genes) may develop inappropriate immunity. Most common are antibodies to:
-Gliadin (affects digestion)
-Cardiolipins (affects blood clotting)
Treg cells: Pathogenic T cells

Increased Cytokines

Increased Leptin

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

Excessive cytokine levels can damage leptin receptors in the hypothalamus.

Leptin receptor

Hypothalamus

VIP MSH AVP

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

Split Products of Complement Activation

C4a: capillary hypoperfusion
C3a: bacterial membranes

Biotoxin (HLA susceptible)

Nerve cell/ axon

Biotoxins have direct effects, including impairment of nerve cell function.

Biotoxin

Removal from the body

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

Inflammation-related symptoms

High levels of cytokines produce flu-like symptoms: Headaches, muscle aches, fatigue, unstable temperature, difficulty concentrating and more. High levels of cytokines also result in increased levels of several other immune-response related substances, including TGF B-1, 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.

Reduced MSH

Sleep Disturbance

Production of melatonin is reduced, leading to chronic, 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. IBS is often present.

Resistant Coag-negative Staph Bacteria

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

Prolonged Illness

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

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 Androgens

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

HLA DR Rosetta Stone

	DRB1	DQ	DRB 3	DRB4	DRB5
Multisusceptible	4	3		53	
	11/12	3	52B		
	14	5	52B		
Mold Susceptible	7	2/3		53	
	13	6	52A, B, C		
	17	2	52A		
	18*	4	52A		
Borrelia, post Lyme Syndrome	15	6			51
	16	5			51
Dinoflagellates	4	7/8		53	
Multiple Antibiotic Resistant Staph Epidermis (MARCoNS)	11	7	52B		
No recognized significance	8	3, 4, 6			
Low-risk Mold	7	9		53	
	12	7	52B		
	9	9		53	

Instructions for Using the Rosetta Stone for HLA DR by PCR

- On a lab report, there are five categories of results. Each patient has two sets of three alleles, unless DRB1 is 1, 8, or 10. Those will only have a DQ, and no DRB 3, 4, or 5. Everyone else will have a DQ and one other allele from DRB 3, 4, or 5.

- You only use the first two numbers from each line of the report.
- If there is one entry, instead of two, the patient is homozygous for that allele.
- The categories are translated:
  - DRB1 = B1
  - DQ = DQ
  - DRB3 = 52A, 52B, or 52C
  - In DRB3, 01 is A, 02 is B, and 03 is C.
  - DRB4 = 53
  - DRB5 = 51
  - In DRB1, if the first two numbers are 03, rewrite it as 17.
- In the Rosetta Stone template, record the genotypes in two columns, one representing each parent.

From Mold Warriors, by Ritchie Shoemaker

BUILDING TESTING - HERTSMI 2

- HERTSMI 2 – DNA analysis of the 5 toxin producing molds

Points	4	6	10
Aspergillus penicilloides	10-99	100-499	500+
Aspergillus versicolor	10-99	100-499	500+
Chaetomium globosum	5-24	25-124	125+
Stachybotrys	5-24	25-124	125+
Wallemia	100-499	500-2499	2500+

- Interpretation:
- <11 statistically safe to enter for those with CIRS
- 11-15 Borderline, clean first and then recheck
- >15 Dangerous for those with CIRS
- Disclaimer: HERTSMI-2 is a building index and doesn't replace careful observation and lab markers.

Evaluation of Mold Exposure

1. Have you been exposed to mold? Water damaged buildings? Do you notice a moldy or musty smell in your home or workplace? Or have you had a professional inspector identify mold or performed a positive mold test? ERMI? HERSTMI-2? Real Time Mycotoxin test? Visual inspections? Air sampling? Source sampling? Other form of testing/identification?

2. Visual Contrast test – right pass or fail
   Left pass or fail

3. Cluster analyses: Give 1 point for any or all symptoms in a category. 6 or more points for children. 8 or more teens and adults. Circle any that apply

   a. Fatigue
   b. Weakness, difficulty assimilating new information, muscle aches, headaches, light sensitivity
   c. Memory problems, word finding difficulties
   d. Problems with Concentration
   e. Joint pains, morning stiffness, muscle cramps
   f. Unusual skin sensations, tingling
   g. Shortness of breath, sinus congestion or nasal drainage
   h. Cough, increased thirst, confusion
   i. Appetite swings, body temperature regulation, urinary frequency/urgency
   j. Red eyes, blurred vision, excessive or nighttime sweating, mood swings, unusual pains esp. "ice pick pains"
   k. Abdominal tenderness or pain, diarrhea or loose stools, numbness
   l. Eye tearing, disorientation, metallic taste
   m. Static shocks, vertigo

   Total number:

4. LABS: HLA haplotype
   MARCONS
   ADH/osmolality
   ACTH/Cortisol
   MMP-9
   MSH
   VEGF
   VIP
   TGF beta 1
   C4a
   Anticardiolipin antibodies — 4 abnl tests <11 yrs +diagnostic
   Anti-gliadin antibodies — 5 abnl tests >11 yrs +diagnostic

Questions to ask:
Do you live or work in a building that has any water damage, leaks, damp basement? Problems with humidity? Flat roofs? Floods? Leaking pipes? Discolored vents or ceiling tiles?
Did you develop your illness after moving to a new house? Changed jobs? Attended a new church, etc?
Do musty odors bother you?
Do you experience excessive fatigue?
Do you wake up refreshed?
Do you have some good and bad days?
Do you feel worse after activity?
Do you have clawing of your fingers or toes?
Do you get static shocks?
Calf or hamstring spasms at night?
Dermatographia?
Hypermobile joints?
Do you have a tremor?
Do you experience shortness of breath? Recurring sinus infections?
Do you experience recurring respiratory infections? Coughing?
Frequent flu-like illness?
Are your symptoms worse after a rainy day?
Do you experience histamine intolerance?