



What is “biotoxin illness” & who is Dr. Richie Shoemaker?

Report on the Parliamentary Inquiry into Biotoxin-related illnesses in Australia

Brad Prezant, MSPH, MBA, CIH, COH, CAQP
VA Sciences
Chief Scientific Officer



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What is a Biotoxin ?

- Something produced by a biological organism, alive or dead, that gets into the body, through an infection, or through inhalation, dermal absorption, or ingestion.
- During an *infection*, a dose of biotoxin is given off by the infecting bacteria as it multiplies within the body & when it dies
- Examples
 - Tick-borne disease – Lyme Disease – is an infection caused by a bacterium - *Borellia* spp.
 - Spider bites
 - Toxic marine algae - Estuary Associated Syndrome – *Pfiesteria* spp.

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Is Mould and Bacteria from wet buildings a Biotoxin ?

Potentially, yes

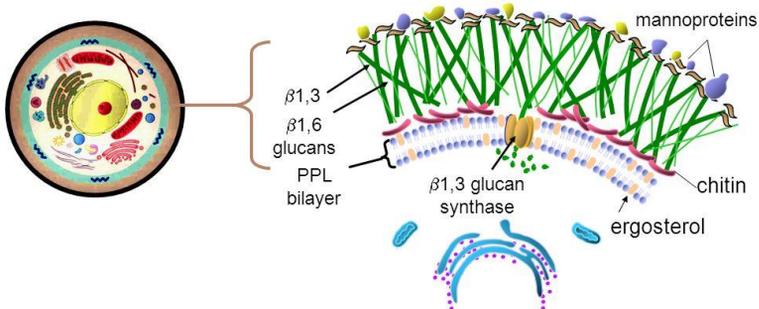
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Is Mould and Bacteria from wet buildings a Biotoxin ?

- Cell wall constituents of fungi contain **chitin**
- Cell wall constituents of fungi contain **glucans**
- Fungi excrete **enzymes** into their environment to digest their food
- Moulds sometimes produce **mycotoxins** *at low levels relative to above substances*, but these also can be considered as biotoxins
- These primary large percentage constituents of fungal biomass have been shown to initiate inflammatory pathways in humans

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Glucans, chitins and ergosterol are key structural components of fungal cell walls



Glucans, chitins, and fungal enzymes affect the innate immune system

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Who is Richie Shoemaker?

- In the 1990s, a family physician saw numerous fishermen from Chesapeake Bay (Eastern U.S.). A marine organism, *Pfiesteria*, was present and fishermen were exposed via inhalation of sea aerosols and handling infected fish
- Fishermen had irritant symptoms but also central nervous system symptoms of disorientation, diminished learning, diminished memory – CNS involvement, GI involvement
- Removing exposure did not necessarily resolve fishermen's symptoms
- Accidental discovery of cholestyramine for diarrhea also seemed to speed up recovery
- Cholestyramine functions as chelating agent to remove toxins from bile & prevent toxin recirculating



Dr. Richard Shoemaker

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Dr. Schumacher continues seeing other patients...

Chronic Inflammatory Response Syndrome

- A theory forged from the experience of Dr. Shoemaker after seeing patients reporting with similar symptoms as the fishermen, after exposure to water-damaged buildings
- A long term (chronic) multi-system, multi-symptom **inflammatory syndrome** (cluster of symptoms) starting with an exposure to a biotoxin (such as indoor dampness but could be other biotoxins), resulting in disruption of multiple body systems.
- Not accepted by traditional medical groups, such as Royal Australasian College of Physicians (RACP), Department of Health
- Susceptible persons (25% of population) genetically lack the ability to manage the toxins in the body by passing them from the **innate immune system** to the more sophisticated, substance-specific **adaptive immune system** – not an allergic mechanism

What is CIRIS?

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Human immune system has two functional components

innate immune system

the stupid part

adaptive immune system

the smart part that learns to recognize bad actors

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CIRS – A Dysfunction of the Immune System

What is CIRS?

- The innate immune system releases inflammatory molecules (cytokines), split products of complement, and TGF beta-1 as a signal, and then the adaptive immune system must provide immunity.
- In people that are genetically predisposed to CIRS and biotoxin illnesses, the innate immune system signals the adaptive system, but the latter does not “see” the biotoxins, and therefore cannot protect the organism from them.
- The first system keeps signaling the latter, and this leads to higher and higher levels of inflammation.
- The biotoxins get removed via the liver into the bile, are discharged into the small intestine, but then get resorbed back into the body, providing a never-ending dysfunctional “over-stimulation”

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Chronic Inflammatory Response Syndrome

What is CIRS?

- Because these biotoxins are not eliminated but stick around and over-stimulate the innate immune system, the released messengers play havoc with multiple body systems resulting in multiple symptoms across various organs – CNS & GI
- Person must be susceptible - Susceptible persons (25% of population) genetically lack the ability to manage the toxins in the body by passing them from the innate immune system to the more sophisticated, substance-specific adaptive immune system

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Common symptoms of CIRS

- Fatigue
- Pain
- Memory and concentration difficulties
- Disorientation, insomnia
- Gastrointestinal issues
- Sinus issues, fever, headaches
- Respiratory issues

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Probability of CIRS is high if:

- History of exposure to biotoxin with signs and symptoms consistent with exposure
- 8 or more of 13 symptom clusters affecting multiple body systems
- Poor performance on the VCS test
- Predisposed due to a human leukocyte antigen (HLA) susceptible haplotype
- 4 of 9 blood markers consistent with vascular, endocrine, and neuro-immune abnormalities
- Abnormal brain volumes measured by MRI

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Must have 8 or more of 13 symptom clusters:

- Cluster 1: diarrhea, numbness, abdominal pain
- Cluster 2: disorientation, watery eyes, metallic taste
- Cluster 3: congested sinuses, shortness of breath
- Cluster 4: impaired memory, difficulty with word finding
- Cluster 5: weakness, body aches, sensitivity to light, headache, trouble learning something new
- Cluster 6: increased skin sensitivity, tingling / pins and needles
- Cluster 7: blurry vision, night sweat, mood swings, sharp pain, red or bloodshot eyes
- Cluster 8: joint pain, morning stiffness, muscle cramps
- Cluster 9: deep, persistent fatigue
- Cluster 10: dizziness, static shocks
- Cluster 11: trouble concentrating
- Cluster 12: extreme thirst, cough, confusion
- Cluster 13: frequent urination, trouble regulating body temperature

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Chronic Inflammatory Response Syndrome

VCS



Figure 1. A simple card test, the Functional Acuity Contrast Test was used to measure VCS in the current PEAS cases using a standard procedure (8). This test measures contrast sensitivity for five sizes (spatial frequencies) of light and dark bar patterns (sinusoidal gratings) because spatial vision is mediated by populations of neurons selectively tuned to different spatial frequency (7). If neurons subserving high spatial-frequency (smaller bars) vision are functionally impaired but those underlying low spatial-frequency (larger bars) vision are functionally normal, for example, then visual perception also will be impaired for high frequency patterns but normal for low frequency patterns.

- Test of the ability to discriminate subtle contrasts
- VCS is considered an indicator of neurological function between the retina (eye) and the cortex (brain), a pathway that is very sensitive to damage by neurotoxins
- First used on Chesapeake Bay fishermen by Shoemaker and others
- Has been used by NIOSH for neurological functional testing but with qualifications – “we do not recommend using VCS testing in a clinical setting to diagnose illness in occupants of water-damaged buildings because of its non-specificity. VCS is adversely affected by a multitude of conditions that are common in general population.”

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Chronic Inflammatory Response Syndrome

Biomarkers (“inflammatory stressors”) of CIRS that are tested in blood labs

4 of 9 abnormal labs considered diagnostic of CIRS

- Over-stimulation of the innate immune system sets off a complex cascade of biochemical events, basically upregulating various inflammatory processes (cytokines) [C4a ↑]
- Enzyme that regulates inflammatory compound migration from blood to organs [MMP9 ↑]
- Biotoxins also affect nervous system (brain) function including the optic nerve leading to poor visual function as an indicator of more serious brain effects (visual contrast sensitivity) [VCS ↓]
- Reduced MSH [MSH ↓] allows resistant staph to survive [MARCoNS ↑ multiply antibioticresistant coagulase negative staphylococcus]
- Increase in leptin [leptin ↑] resulting in poor regulation of hunger sensation and weight gain
- Physical changes occur in the brain, detectable by examining the volume of different compartments, using an MRI test called [NeuroQuant](#).

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Blood markers tested in CIRS patient evaluation and treatment

- Vasoactive Intestinal Polypeptide (VIP) – Normal range is 23-63 pg/mL. CIRS patients usually have lower levels.
- Melanocyte Stimulating Hormone (MSH) – Normal range is 35-81 pg/mL. CIRS patients usually have lower levels.
- Transforming Growth Factor Beta-1 (TGF Beta-1) – Normal range is <2380 pg/ml.
- C4a – Normal range is 0-2830 ng/ml.
- Antigliadin (AGA IgA/IgG) – Normal range is 0-19.
- Adrenocorticotrophic hormone (ACTH)/Cortisol – Normal range is ACTH 8-37 pg/mL. Cortisol in the a.m. 4.3-22.4 and p.m. 3.1-16.7 ug/dL. CIRS patients usually have higher levels.
- Vascular Endothelial Growth Factor (VEGF) – Normal range is 31-86 pg/mL. CIRS patients usually have lower levels.
- Antidiuretic hormone (ADH)/Osmolality – Normal range is ADH 1-13.3 pg/ml and Osmolality 280-300 mosmol.
- Matrix Metalloproteinase 9 (MMP-9) – Normal range is 85-332 ng/mL.
- Leptin – Normal range is 0.5-13.8 ng/mL for men and 1.1-27.5 ng/mL for women.

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“Brain on Fire”



Increased permeability of the blood-brain barrier due to chronic, systemic inflammation – “leaky brain”

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Criteria for Positive CIRS Diagnosis

- History of biotoxin exposure, as well as signs and symptoms consistent with the exposure
- 8 of 13 symptoms in cluster
- Presence of a susceptible haplotype (genetic predisposition)
- Abnormalities in VCS
- 4 of 9 abnormal biomarkers consistent with vascular, endocrine and neuro-immune abnormalities

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The Personal Costs

“The personal financial loss has also been immense, due to direct health costs, such as out of pocket testing, medications, supplements and doctor visits that I estimate as \$75,000 - \$100,000.”

“... I disposed of over two-thirds of my belongings as they were contaminated by the biotoxins from the water damaged house and could not be guaranteed to be treated and free from biotoxins in the future ...”

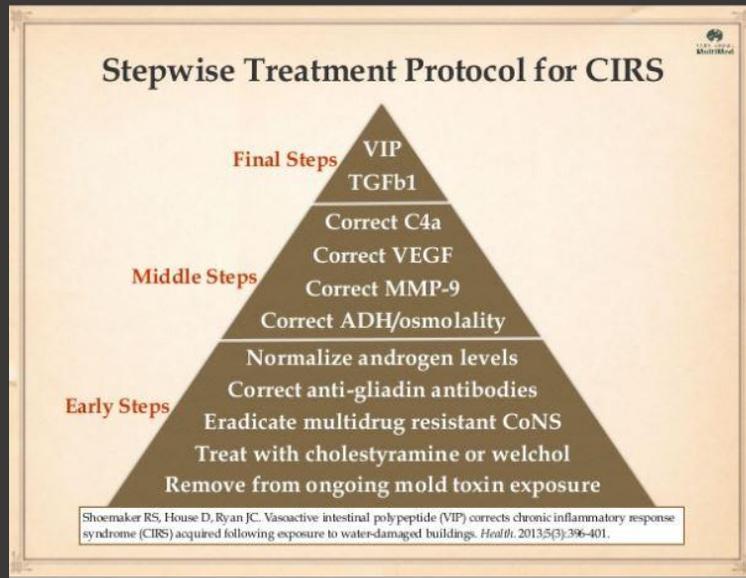
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The Personal Costs

“We have now spent literally thousands of dollars (over \$200,000) including moving house, remediation, buying all new furnishings and belongings, repairs to [our] new house to make suitable for me, medications and medical visits. I have used up much of my superannuation and my partner is paying a mortgage that is over 40 percent of his pay. I am unable to work as I am so reactive to places.”

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The Shoemaker Treatment Protocol



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Verifying the exposure through history and through...

ERMI and HERTSMI-2

- It is unclear to what extent an ERMI reading in a single residence is “normal” or elevated, partly due to lack of validation in Australia and partly due to inherent variability in the method
- Swiffer cloth methodology is often mis-applied (? Sampling techniques)
- ERMI may give many false positives (non-WDBs that test “positive”)
- USA EPA states that “EMRI should be used for research only”
- ERMI could be confirmed to give reliable information about safety of re-occupancy of a building by a CIRS patient

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The Shoemaker Treatment Protocol

- Structured, expensive, step by step diagnosis and treatment protocol (11 step biotoxin removal program) supervised by a physician that can take weeks to months or even years to accomplish
- Verify diagnosis through biomarkers and HLA Test (genetic susceptibility)
- Remove exposure to biotoxins (home & possessions)
- Give patients binder medications to eliminate biotoxins
- Treat Staph colonization in the upper respiratory system
- Correct inflammatory and hormonal dysregulation
- Administer a nasal spray to restore vasoactive intestinal polypeptide (VIP)

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Who follows the Shoemaker Protocol?

- Certified physicians through Shoemaker's company. Currently 25 physicians, mostly MDs , naturopaths, acupuncturist, 1 in Canada, 1 in the UK, formerly 2 in Australia (now de-certified)
- Other physicians not certified, e.g., list from Paradigm Change website, circa 100 physicians, naturopaths, osteopaths, chiropractors, 16 from Australia

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Inquiry into Biotoxin-related Illnesses in Australia

Following a referral on 21 June 2018 from the Minister for Health, Aged Care and Sport, The Hon Greg Hunt MP, the Committee inquired into and reported on Biotoxin-related Illnesses in Australia.

The Committee invited interested persons and organisations to make submissions

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Report on the Inquiry into Biotoxin-related illnesses in Australia

A 73 page report was issued in October 2018

Submissions were received from 142 individuals, professional organisations, physicians, and companies

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Submitting Entities

- Individuals (& TMSA)
- Treating physicians
- Medical organisations (ACIIDS, RACP)
- Professional societies (AIOH, ASBB, AIMA, AIQA)
- Stakeholders (Real Estate Institute of NSW, NATO, Tenants Association)
- Consultants
- Government agencies (DOH)

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Objectives & Scope

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Health impacts of indoor dampness and/or mould

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Objectives & Scope

Prevalence of CIRS and
biotoxin-related illnesses
in inquiry participants

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Objectives & Scope

Current medical process
of identifying CIRS and
biotoxin-related illnesses
and available treatments

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SEVEN RECOMMENDATIONS - ONE

- The Department of Health produce and publish in a short term a fact sheet, and in the medium term undertake to do further research on:
 - The potential health effects of exposure to damp and mould
 - The prevalence of dampness and mould in the built environment
 - Advice on the prevention and removal of mould

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SEVEN RECOMMENDATIONS - TWO

- The Australian Government work with the states and territories to conduct further research into, and develop standards and/or accreditation requirements for the mould testing and remediation industries, which should include consideration of:
 - The most effective methods of testing and remediation of buildings affected by mould and/or moisture
 - Appropriate accreditation requirements for professionals working in these fields; and
 - Options for greater regulatory oversight of these industries

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SEVEN RECOMMENDATIONS - THREE

- The Australian Government work with the states and territories to ensure that tenants in rental properties, aged care facilities, and community, social and public housing are provided with timely information about disclosure and rectification of any previous or existing mould and/or water damage issues in a property before entering into a residential leasing arrangement.

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SEVEN RECOMMENDATIONS - FOUR

- The Australia Government work with the states and territories to conduct further research into the adequacy of current building codes and standards related to the prevention and remediation of dampness and mould in buildings

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SEVEN RECOMMENDATIONS - FIVE

- The Department of Health conduct a review into the treatment of patients presenting with complex illnesses that are difficult to diagnose such as those with CIRS-like symptoms:
 - Provide effectively and timely treatment
 - Whether doctors require further support in order to: identify environmental impacts on health; manage complex conditions; and provide appropriate treatment

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SEVEN RECOMMENDATIONS - SIX

- The Australian Government commission the National Health and Medical Research Council to conduct research into CIRS-like syndromes with a view to assisting in the diagnosis, treatment and management of patients.
- Research links between mould and biotoxins and complex symptoms most commonly reported as typifying CIRS

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SEVEN RECOMMENDATIONS - SEVEN

- The Department of Health, in consultation with patient groups, medical practitioners and health bodies, develop clinical guidelines for general practitioners for the diagnosis, treatment and management of CIRS-like conditions.

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Excerpts

“The Department of Health stated that, at this stage, ‘the scientific evidence is not sufficient ... to accept the assertion that exposure to environmental biotoxins is causing [CIRS].”

“The Royal Australasian College of Physicians preferred to use the phrase ‘people with multiple not-readily-explained symptoms.’”

“The Royal Australasian College of Physicians (RACP)...stated:

... sufficient research has not been conducted nor consensus reached for the terms ‘biotoxin-related illnesses’ or ‘Chronic Inflammatory Response Syndrome (CIRS)’ to be used as valid diagnostic labels.”

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Excerpts

The Department of Health stated that:

... the symptom complexes are so similar between people with this condition, the tick-bite associated group and the chronic fatigue group, we're very concerned to make sure that the first thing we do is have everybody properly assessed in a sympathetic and comprehensive way by physicians. In the tick-bite group in Melbourne, we found 40 per cent of them had otherwise undiagnosed illnesses, including brain tumours, musculoskeletal rheumatic disorders, and a small number had diagnosable psychiatric illnesses. So our very first priority is to make sure that people don't latch on to a diagnosis because their symptom complexes match what's on a website or a list and that they have a proper comprehensive assessment."

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Excerpts

"The RACP also stated that it would 'express caution' in using the phrase 'diagnostic' when describing a connection between mould and CIRS-attributed symptoms. The RACP stated:

... [the] phrase 'diagnostic' implies that there is a strong connection that is causative. When we have someone reporting the sense of odour, the sense of moisture or whatever it is that they're reporting—the visual or the olfactory sense being stimulated—it raises the level of suspicion but it's not diagnostic. That's the problem. It's because people assert diagnostic connectivity when the evidence isn't there to actually say that that level of mould in that particular premise is causative. It's an implied association."

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Committee Conclusions

“CIRS has been defined as a syndrome, which is different from a disease. In particular, the Committee heard that a syndrome may not be supported by a consensus medical view regarding cause, testing and/or treatment and that there are no clinical guidelines pertaining to CIRS or CIRS-like symptoms.”

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Biotoxins

Evidence-based medicine has yet to accept Shoemaker's theories

He has rattled the medical orthodoxy and persuaded dozens of physicians to use his system or evolve into their own system using combinations of his approach with other approaches

There are good reasons to not fully accept his theory, but it is possible that if further research is performed, portions or all of his ideas may be validated

It is also possible that his theories are incorrect...in whole or in part

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Importance Date

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It is with great delight we welcome you to the 16th Conference of the International Society of Indoor Air Quality & Climate (Indoor Air 2020) at COEX in Seoul, Korea from July 20 to 24, 2020. As fine dust in the atmosphere has become an especially serious social problem in Korea and throughout the world, and as buildings get bigger and more concentrated, the interest in the indoor environment has been growing more than ever. To solve these global issues, the Korean Society for Indoor Environment will

**Abstract
Submission
Deadline**

**Symposium/
Workshop
Proposals Due**