NutriPATH
INTEGRATIVE PATHOLOGY SERVICES

PORPHYRINS

The porphyrin test is a powerful biomarker of environmental toxicity. Porphyrins are intermediate products in the production of haem, which involves at least eight enzymes which are highly sensitive to toxins. When certain chemicals are present in the body these enzymes are inhibited, particular porphyrins build up and a distinctive pattern of porphyrins specific to each toxin is produced. These patterns of porphyrin production can therefore be used to analyse the presence of environmental toxins in the body and therefore of chemical exposure. Several health disorders have abnormal porphyrin levels associated with chemical exposure including chronic fatigue, multiple chemical sensitivities, learning and behavioural disorders as well as mental health conditions.

Multiple studies have recently revealed that autism spectrum disorder (ASD) is also associated with abnormal patterns of porphyrin production. It was suggested by these investigators that porphyrins should be routinely clinically measured in ASDs and potential ASD treatments should consider monitoring porphyrin levels.

Chemical exposure

Since World War II the quantity of synthetic chemicals that have been produced and introduced into the environment has increased exponentially. This increase in chemical exposure has had an impact not only on the environment but on human health. Many of these substances including halogenated hydrocarbons and heavy metals are known to affect the immune system, detoxification pathways and the central nervous system, as well as promote inflammation. Conditions ranging from cancer, dermatitis, renal disease, chemical sensitivities, autism and other mood disorders are associated with exposure. Being able to detect the presence of these toxins in the body is therefore an important step forward for the prevention and treatment of these and other chemical associated disorders.

A sensitive test for chemical and heavy metal exposure

Porphyrins are powerful biomarkers of environmental and heavy metal toxicity. Any disturbance in the pathway tends to cause rapid and relatively large accumulations of intermediates, such as porphyrins. Porphyrins (and porphyrinogens) are intermediate products in the production of haem. Haem is an essential molecule in the body producing haemoglobin, cytochromes and electron transport chain proteins. Heme production is a constantly changing pathway that is active in every cell. The production of haem from glycine and succinyl CoA involves at least eight enzymes which are highly sensitive to toxins. When certain chemicals are present in the body these enzymes are inhibited, particular porphyrin build up and a distinctive pattern of porphyrins specific to each toxin is produced. Common toxins which affect porphyrin metabolism include **lead, mercury, arsenic, cadmium, hexachlorobenzene and dioxins**.

SYMPTOMS AND CONDITIONS ASSOCIATED WITH SECONDARY PORPHYRIAS	
Behavioural and learning disorders	Immune dysfunction
Chronic fatigue	Multiple chemical sensitivity
Exposure to Agent Orange	Neurological and mood disorders
Fatigue	Memory loss
Gastrointestinal disorders	Loss of appetite

Porphyurias

Porphyurias are not only associated with toxic exposure but are also an inherited (genetic) condition. The porphyrias are relatively uncommon conditions which are probably under-recognised. Most individuals who possess the genetic mutation associated with acute porphyria show no symptoms throughout their lives. However, some of the inherited porphyrias occur commonly as toxicogenetic conditions; the genetically acquired trait is clinically latent until clinical manifestations are triggered by exposure to certain therapeutic drugs, chemicals, alcohol or other stressors.

Secondary porphyrias and health conditions

Secondary porphyrias (also known as porphyrinurias) are defined as porphyrias that occur without a genetic defect of haem synthesis. These porphyrias are associated with environmental exposure to toxins. It has been hypothesised that several health disorders have abnormal porphyrin levels associated with chemical exposure. These conditions include chronic fatigue, multiple chemical sensitivities, learning and behavioural disorders as well as mental health conditions.

PORPHYRINS (urinary) [Test code: 4024]

- Uroporphyrins I, Uroporphyrins III, 7-Carboxy Porphyrin, 6-Carboxy Porphyrin, 5-Carboxy Porphyrin, Precoproporphyrins, Coproporphyrins I, Coproporphyrins III.

Related Tests:

- **Hair Mineral Analysis - Level 1 [5013]:** Ca, Cr, Cu, Fe, Mg, Mn, Se, Zn; Al, As, Cd, Hg, Ni, Pb, Ag, Sn
- **Hair Mineral Analysis - Level 2 [5014]:** B, Ca, Co, Cr, Cu, Fe, Ge, I, Li, Mg, Mn, Mo, Se, Sr, V, W, Zn; Al, Sb, As, Ba, Be, Bi, Cd, Hg, Ni, Pb, Pd, Pt, Ag, Tl, Sn, Ti, U, Zr
- **Heavy Metal Analysis (urine) [5020]:** Ag, Al, As, Ba, Be, Bi, Cd, Hg, Ni, Pb, Pt, Sb, Sn, Tl
- **Essential Mineral & Heavy Metal Analysis (urine) [5021]:** B, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Se, Sr, V, Zn; Ag, Al, As, Ba, Be, Bi, Cd, Hg, Ni, Pb, Pt, Sb, Sn, Tl
- **PRE-Chelation Metals Challenge (spot urine) [5022] *or* POST Chelation Metals Challenge (spot urine) [5024]:** Ag, Al, As, Ba, Be, Bi, Cd, Hg, Ni, Pb, Pt, Sb, Sn, Tl
- **PRE-Chelation Metals & Minerals Challenge (urine) [5023] *or* POST Chelation Metals & Minerals Challenge (urine) [5025]:** B, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Se, Sr, V, Zn; Ag, Al, As, Ba, Be, Bi, Cd, Hg, Ni, Pb, Pt, Sb, Sn, Tl
- **Red Cell *or* Whole Blood Metals [5026]:** Al, Sb, As, Be, Bi, Cd, Hg, Ni, Pb, Pt, Ag, Tl, Sn, U, Zr
- **Urine Mercury [5032]:** Mercury
- **Faecal Minerals & Metals [5034]:** Cr, Cu, Zn, W; As, Be, Bi, Cd, Ga, Hg, Ni, Pb, Pd, Pt, Sb, Tl, Ti, U
- **Saliva Metals [5035]:** Cr, Co, Mo, Cu, Cd, Ga, Ir, Hg, Ni, Pd, Pt, Rh, Ag, Sn

How to order a test kit:

To order a test kit simply request the test name and/or test code on a NutriPATH request form test code and have the patient phone NutriPATH Customer Service on 1300 688 522.

NutriPATH
Integrative Pathology Services

Phone 1300 688 522 for further details
www.nutripath.com.au