Methylation, Epigenetics & Nutrigenomics: Identifying & Correcting The Core Issues In Disease

By Michael McEvoy, FDN, CNC, CMTA - March 27, 2013  With 0 comments

Have you heard of methylation before? In 5-8 years from now, problems in a person's "methylation" cycle is going to be widely recognized as one of the core, underlying factors in many health issues and degenerative diseases.

Methylation gene defects and epigenetic alterations to certain genes essential in the methylation pathways of the body can explain many, if not most mental illnesses, including: schizophrenia, bi-polar, mania, depression and OCD. The understanding of methylation's role in mental health has evolved from the extensive research of Abram Hoffer, MD, PhD, Carl Pfeiffer, MD, PhD, William Walsh, PhD and others.

Problems in how certain individuals methylate is being studied extensively in autism research. Leading the charge in this field are researchers such as Amy Yasko, PhD. Yasko makes it a point to explain that the causative biochemical factors faced in neurodegenerative diseases are very similar, and largely involve problems in how a person methylates.

Methylation: Critical for Biochemical Function

Research reveals that environmental factors, such as diet and toxicity have an enormous influence on how methylation pathways function. For example, deficiencies in certain key nutrient substrates such as L-methionine, folate, B-6 and B-12 will greatly impact activity in methylation pathways. Genetic defects in methylation pathways are also a factor that can block the expression of certain genes, or cause the expression of others.

Methylation is a critical series of pathways in biological systems. How important is methylation? Consider that methylation results in:

- neurotransmitter synthesis, chiefly dopamine, norepinephrine and serotonin, which influence mood, sleep, behavior, cognition and memory
- regulation of gene expression & protein function
- synthesis of cellular antioxidants such as glutathione
- modification of toxic, heavy metals
- immune activation and regulation
- regulation and expression of homocysteine
- the expression or suppression of a disease, and the suppression of genes that should not be expressed
- repair and regeneration of cells, tissues and DNA
- hormone activity and expression
- viral inhibition

Consider that blocks or defects in methylation pathways can have very serious consequences. For example, improper re-methylation of homocysteine can cause a high level of homocysteine in blood, and become a primary factor in the development of cardiovascular disease and cancer. Or, due to a congenital defect in a methylation gene, such as MTHFR, homocysteine levels may be elevated significantly and be the missing link in the development of cardiovascular disease, leukemia, colon cancer, vascular disease and others.

MTHFR

If mutations or defects in certain methylation genes exist, the complex methylation sequence will be negatively affected, and consequently, the synthesis of certain biochemical substrates may be produced in reduced quantities. In recent years, an enormous amount of research has surfaced regarding one gene/enzyme in particular, MTHFR (methylenetetrahydrofolate reductase). There are actually more than 50 genes that make up MTHFR. This gene mutation is implicated as a causative factor in a very long list of diseases, including mental illness, neurological diseases such as Parkinson's, Alzheimer's, autism, as well as fibromyalgia, multiple sclerosis, spina bifida and many more.

If an MTHFR gene mutation exists, a person may not convert enough of the folate substrates into the correct forms needed, and consequently there will be immense blocks in how the methylation pathways function. This will effect other parts of the methylation pathways, and can result in serious mental illnesses, disease progression and various toxicities. Nutritional biochemical science has responded by formulating the missing nutrient if an MTHFR mutation exists. The nutrient is called L-5 MTHF.

Identification of Other Gene Mutations

There are many, many genes involved in the methylation cycle. Genetic methylation tests can now identify many of the core genes that may be damaged, or mutated. Other gene defects such as MTRR indicates a person may not properly methylate...
B-12. As a result, homocysteine toxicity will take place, as well as poor conversion of L-methionine into SAMe. An MTRR mutation can result in birth defects, high levels of homocysteine, down syndrome and cancer, and like other gene mutations, will alter other aspects of how the methylation pathways function. If an MTRR gene mutation exists, supplementing with the correct form of B-12 may be imperative in order to bypass the mutation, or to stimulate the biochemical reaction needed.

Another example of a methylation gene mutation is CBS mutation. In this mutation, it has been observed there can be a major up-regulation of sulfur bi-products, such as sulfite and sulfate. As a result, there may be a high amount of ammonia produced and glutathione levels become depleted.

The above are 2 examples of gene mutations in the methylation pathways. Obviously, things can get complicated when there is more than one genetic mutation present. Fortunately there is brilliant research that is emerging with rapid fervency.

Nutritional Science Is On The Cutting Edge
Can you imagine a world where disease, illness and human suffering is less? I can. Discoveries in genetics, epigenetics and biochemistry have allowed the floodgates to open, with the very real possibility that many diseases can now be prevented, and even reversed with gene-specific nutrient therapy.

Nutrients, not pharmaceuticals are the fuel that drives all biochemical pathways. The science of the study of nutrients and genetic expression is referred to as "nutrigenomics". This is the future of medicine.

There now exists a flurry of gene and methylation panel testing, which can identify your body's essential nutrient needs with specificity. Contact me if you are interested in my testing recommendations.

Bypassing mutated genes by supplying missing nutrient substrates in certain methylation pathways will change how all cells of your body function. Identification of genetic methylation defects may explain so called "bad genes" or "congenital tendencies". Furthermore, due to the paradigm-changing and emerging science of epigenetics and nutrigenomics, there is no further need to assume that inherited genetics or "bad genes" is a death sentence to disease. That paradigm is out the window, and anyone still adhering to that dogma has already been left in the dust.

If you would like to speak with Michael and Julie regarding your health & nutrition needs, or to schedule a private consultation, please contact us here.

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Meet The Team
Michael McEvoy and Julie Sands Donaldson have over 44 combined years experience in the fields of health & nutrition. 
Speak with them today about a Private Nutrition Consulting Session.