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Overview

I have processed your 23andMe results with a piece of custom software which extracts SNPs (Single Nucleotide Polymorphisms) related to Methylation (more detail on this later), Detoxification, Immune system response, and some other potentially interesting SNPs.

It should be understood that the presence of a certain genetic “defect” or variant doesn't necessarily lead to an actual functional defect. One reason for this is that the body may be able to compensate without harm through different mechanisms, some of which may not yet be known by science.

This said, it is quite common that potential genetic bottle necks identified through genetic testing are relevant to a person’s health and what he or she needs to do to get healthy and to stay healthy. Personally, I think that the more we are exposed to environmental stressors such as from bad diets or toxic exposures, the more our genetic weaknesses may become problematic for us.

When you read through this review, note that, generally speaking, having a single copy (yellow) of a mutation should theoretically make the mutation 50% less active than if one has two copies (red), but in reality this doesn’t always play out. It is possible to be “yellow”, but function as a “red” (or vice versa) due to strengths and weaknesses elsewhere in the body (or due to the absence or presence of stressors such as toxicity or poor gut health). One may also be free of issues even if one tests red for a mutation, or suffer from issues even if one is green. Genetics is not destiny!

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Legend for looking at your appendix	
-/-	Neither chromosome carries a genetic variation
+/-	Heterozygous. (A chromosome from one parent, carries a variation)
+/+	Homozygous (A chromosome from each parent carries a variation.)
NC or --	No Call. Data for this SNP could not be processed.

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Summary

Main points for consideration. (The genes involved in each section are in brackets and can be found in your appendix)

Diet:

- A mixed macronutrient (Protein, fat and Carbohydrate) but slightly lower fat diet (ACAT gene) should suit you best. I would not think it is necessary to use any extreme diets (Ketogenic, Low Carb, Vegan etc). When constructing your diet, it should include: High sucrose carbohydrates (fruit, juice, honey, maple syrup and a little raw sugar), all vegetables (including potato and other starchy vegetables), a little rice and quinoa, all unprocessed meats, seafood, eggs, bone broth, gelatin, whey protein, organic dairy products (like cheese and butter), quality saturated and monounsaturated oils (coconut oil, coconut milk, butter, cold pressed olive oil, ghee), salt and a few nuts and seeds.
- You will also require a good amount of salt to keep your blood pressure stable and your adrenal glands functioning optimally.
- Choose organic, toxic free where possible (PON1).
- You are a fast metabolizer of caffeine (CYP1A2 gene) so it should be beneficial for you to consume moderately.
- Vitamin B12 intake is important for you to monitor, as you may have trouble absorbing bioavailable forms (FUT2), transporting it into the cell, and then recycling it as part of the methylation cycle (MTR and MTRR genes). Low dose lithium can help with the recycling of B12 and its facilitation across the cellular membrane.

Genetic Interpretation Carter Tinkler

- Low Vitamin D may also be an issue (VDR and CYP24A1 genes) so getting sun exposure where possible is very important for you. You need as much time as possible between 6 and 10am with no glasses, shoes and as fewer clothes as possible. You can also download the D minder app on your phone to let you know when the best time is to be outside to get the most vitamin D.

Genetic Interpretation Carter Tinkler

Methylation:

- The methylation process is an important one in the body. Methylation turns genes on and off and regulates just about every body function including the rebuilding and repairing of the body. Therefor it is crucial that you methylate properly. To methylate properly, we need SAMe. The body has a complex mechanism to make it. When SAMe performs its appropriate task, it turns into Homocysteine, a substance that needs to be recycled back into SAMe and turned into the master antioxidant, Glutathione. This can also cause an increase in histamine (and allergies) as methyl groups are required to break down histamine.
- You have many gene variants that predispose you to having problems in the methylation cycle and a subsequent decrease in SAMe, an elevation in Homocysteine and lowered glutathione levels. (BHMT, MTHFR, MTHFD1, DAO, CBS, DHFR, MTR, MTRR, COMT, CTH, PEMT). Monitoring Blood Homocysteine levels periodically will be important.
- Probably the most important and well researched gene in relation to methylation is the MTHFR gene. There are 2 variants that seem to have the most impact. The C677T variant and the A1298C. You have one copy of the C677T variant which means that the enzyme it encodes for works at approximately 70% efficiency. This can have a small impact on the methylation cycle as stated above.
- Here are a few simple You Tube clips on Methylation that might help you understand the process better

https://www.youtube.com/watch?v=o4uqEDK6BvM https://www.youtube.com/watch?v=kZXKNYSXBCs

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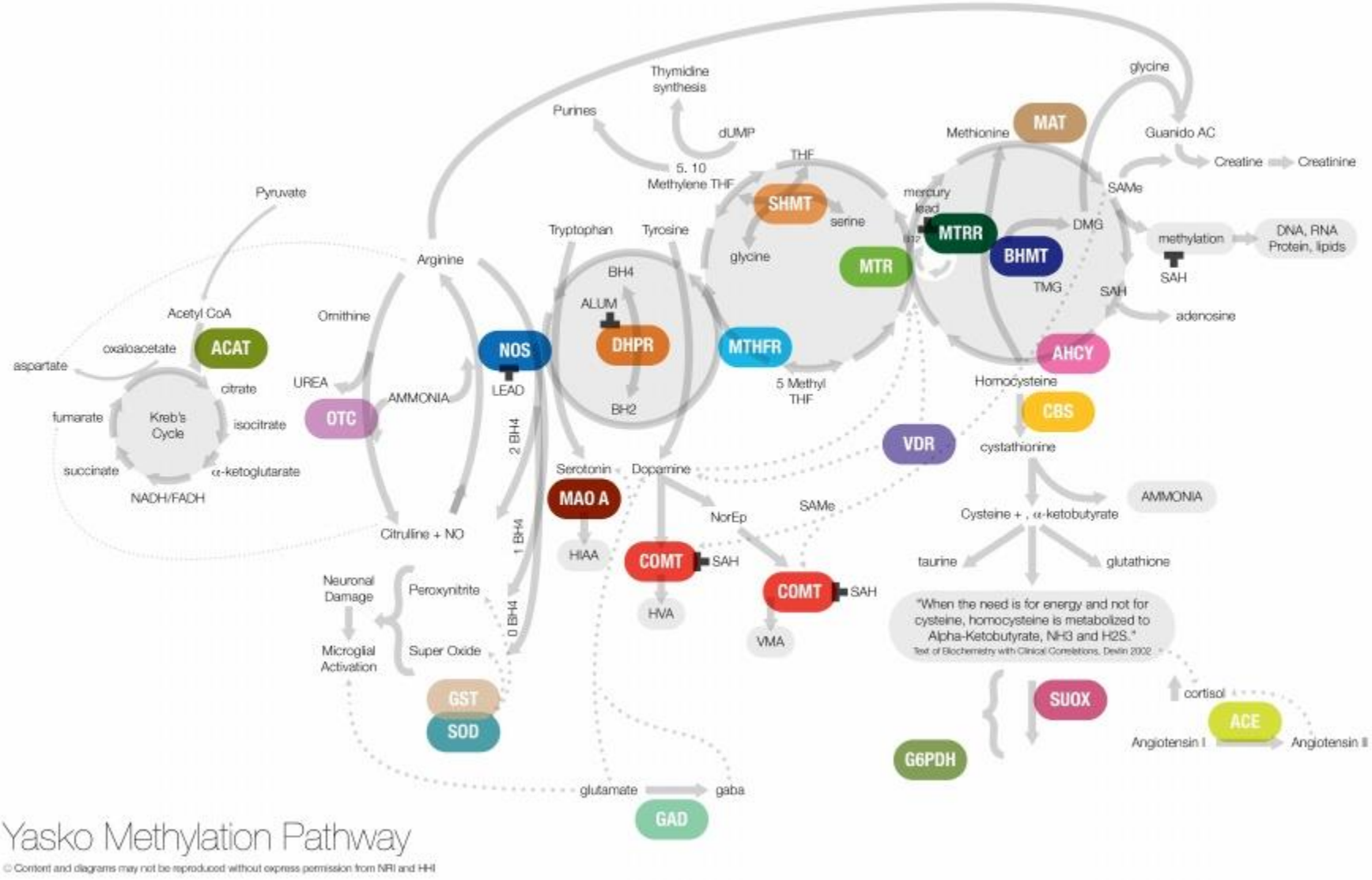
This is the methylation cycle:



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Detoxification

- Your genetics show a decreased ability detoxify pesticide's, xenobiotics, heavy metals and some pharmaceutical drugs (CYP1A1, CYP2C19, CYP2C9, GPX3, CYP1B1, NAT2, MTR, MTRR, CTH, CBS, PON1 and GSS genes). Limiting your exposure to these compounds as well as well as supporting the liver with nutrients such as B12, folate, zinc, choline, copper, NAC etc. will be important.
- One of the most impactful detoxification gene that you have is PON1. You have 2 copies of the gene which means its function has been dramatically reduced. It is this enzymes responsibility to detoxify Organophosphates (pesticides). It also plays a protective role in HDL cholesterol function, reducing atherosclerosis (hardening of the arteries) and acts as an anti-bacterial signaling molecule or the immune system.

Neurotransmitters

- The main genes responsible for the breaking down Dopamine and Adrenaline (catecholamine's) are the COMT and MAOB genes. You have a variant of COMT of both genes that work slower than other variants. This means that in times of elevated stress, you may have trouble balancing catecholamine's (Dopamine and Adrenaline). This situation can also lead to a toxic shunt that pushes dopamine and adrenaline metabolites towards neurotoxic substrates, causing oxidative stress and further affecting imbalances in mood and brain processing.

Genetic Interpretation Carter Tinkler

- Substances that further slow the functioning of these enzymes, such as elevated estrogen, toxic metals, inflammation and immune system stimulation will compound the issue as well.
- Imbalanced catecholamine levels in the body can lead to mood swings, anxiety, depression and despair, restless legs, upper body and neck pain, dry eyes and paranoia. Because of your methylation blocks, you may show symptoms of high and low methylation.
- Your genetic predisposition is to deplete serotonin slowly (MAOA gene). Elevated levels of serotonin can imbalance dopamine even further. 5-HTP, tryptophan and other serotonin precursors or MAO inhibitors (eg anti-depressants) should only be considered after functional testing has been used to establish low levels of serotonin.
- Your ability to make Gaba (a calming Neurotransmitter) may be limited with the many polymorphisms in the GAD gene.

Estrogen

- You will need to monitor your Estrogen levels going forward as some of the major pathways that detoxify Estrogen in the body are slowed for you (SULT1A2, CYP2D6, CYP1A2, CYP1A1, CYP2C19, CYP1B1, MTHFR, UGT1A7, UGT1A8 and COMT genes). This also means limiting exposure to xeno-estrogenic compounds, avoiding GMO soy and eating plenty of coniferous vegetables, such as broccoli, cauliflower and cabbage will be in your best interest. Obviously keeping the bowels regular and having good bile flow will be essential, as will keeping zinc and copper in their correct balance.

Genetic Interpretation Carter Tinkler

Choline

- Choline is an extremely important nutrient in the body. It is a component of every cell membrane in the body and is important for liver health and cholesterol balance. Your body has an increased need for dietary Choline as its production and stability in the body is limited (PEMT and MTHFD1L genes). Good sources of Choline are egg yolks, lecithin and shellfish (especially prawns).

Gut Function

- Recent research has identified a key gene that influences gut bacteria in a major way. This gene is known as FUT2. Genetic mutations in FUT2 (of which you have 1 Copy) has shown to be a linked with decreases in Bifidobacterium, a key beneficial microbial colony that lines the gut. Additionally, research shows that FUT2 mutations are strongly associated with Crohn's Disease and Ulcerative Colitis, which are inflammatory and autoimmune bowel conditions, as well as low levels of functional vitamin B12 in the body (blood tests will usually show normal/high plasma levels).
- This is compounded for you with polymorphisms in the MTHFS, BHMT and GAD genes.