

DIRTY GENES, by Dr. Ben Lynch, ND, A Book Report by David G. Schwartz, MD
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How important are genes? For a long time we knew that our genes determine many of our characteristics, like hair and eye color, facial features, etc. When the genome project started, people expected that these discovered genes would provide answers to many diseases with “unknown” causes, but when the project was completed, we found that genetic traits were not “set in stone.” Genes can be affected profoundly by environmental factors, lifestyle, nutrition, toxicants, etc. This is study known as the science of *epigenetics*. It does help to know some of our genetic variations, so that we can know how to modify our actions to reduce our risks. People have many variants in their genes that affect risks for certain health conditions. These variants are called *single nucleotide polymorphisms* (SNP’s). People often wonder, “Should I do some testing for my SNP’s?”

Ben Lynch describes the seven most common and most significant SNP’s, which he terms, “dirty genes,” which can be cleaned mostly with lifestyle and nutrition, a major part of which can clean all 7 of the genes. The surprising thing is that you probably don’t have to actually have genetic tests done, but certain dirty genes can be suspected just by symptoms and signs. He lists those symptoms that lead you to suspect a SNP in a certain gene. These symptoms can be improved by the cleaning process, so that a dirty gene can be led to behave like a normal gene. The other surprising thing is that normal genes can behave like a dirty SNP’s because of poor environmental factors, and they also can be cleaned up. Before we had so many environmental toxicants, junk food, sleep loss, etc., people had these same SNPs that we have today, yet they didn’t get our sicknesses. Now the weak spots show up, and we have to deal with them.

Dr. Lynch is well recognized by many functional medicine doctors as an expert on interpreting genes and counseling people for better health. His book has received praise from several New York Times bestselling authors such as Kelly Brogan, MD, David Perlmutter, MD, Alan Christianson, NMD, Sara Gottfried, MD, Chris Kresser, MS, Lac, Dr. Peter D’adamo, Dr Joseph Pizzarno, and Dr. Izabella Wentz. He has helped thousands of clients to better health and has trained thousands of physicians and other health professionals around the world in the science of epigenetics. A specialist in environmental medicine, he also vastly improved his own health with this knowledge, and he is committed to teaching other health professionals about this vital course of study.

At first I found this a bit daunting, the enormous complexity of the interrelationships of all these genes and their profound effect on health, mediating many changes in physiology. I hope that presenting this information will be understandable and not too cumbersome and wonky because of the many details.

We all have a multitude of SNP’s, and Dr. Lynch has chosen seven of the most significant ones that affect so many systems in the body. He first recommends a two week “soak and scrub” process that helps clean up all the genes in general. Then he presents a two week “spot cleaning” for specific genes still having problems. The plan is to work mainly with lifestyle, especially foods. In the spot cleaning phase, supplements may be carefully used. Often people think, “Oh, if my methylation is poor, I’ll just take some folate and B-12,” or “If my NOS3 is poor, I’ll just take some arginine to boost my nitric oxide.” It’s not that simple. A supplement may help for a short while, or it may actually cause worse symptoms. After the spot cleaning, a plan for keeping the genes clean for life, and if still not recovered, consulting with a specialist to do further testing. Of the “super seven,” he lists the most basic genes first, the most important ones, that also affect the other genes.

The number one is the methylation master gene, the MTHFR. It affects stress response, inflammation, brain chemistry, energy production, immune response, detoxification, antioxidant production, cell repair, and expression of other genes. Is there anything left out? Then COMT has powerful effects on mood, focus, and estrogen metabolism. DAO can affect sensitivities to food and chemicals, and allergies. MAOA helps govern dopamine, norepinephrine, and serotonin, brain chemicals that affect mood, alertness, energy, vulnerability to addictions, self confidence, and sleep. GST/GPX affects ability to detoxify and eliminate chemicals. NOS3 affects nitric oxide production, blood flow, and arterial health. PEMT supports cell membranes and liver, affecting bile flow, muscle health, and brain development. All these taken together, dirty genes can cause chronic health problems such as cardiovascular disease, autoimmune disorders, anxiety, depression, obesity, cancer, and diabetes. If you tried to clean up just one gene, you wouldn't get very far. That is why he does the scrub and soak for all the genes at once.

These are the factors that need to be cleaned up: Diet – Too many carbs, sugar, protein, not enough healthy fat, and a shortage of nutrients. Exercise – Sedentary lifestyle, over-training, electrolyte deficiency, and dehydration. Sleep – Not enough deep, restorative sleep, going to bed late, and irregular sleep patterns. Environmental toxins – Dirty food, water, air, and products such as sprays, cleaners, cosmetics, paints, pesticides, and herbicides. Stress – Physical stresses, long term illnesses, chronic infections, food intolerances. Psychological stresses such as those connected to work, family, relationships, etc.

The first part of the Clean Genes Protocol is the two week soak and scrub. Eat appropriate amounts of protein and healthy fat, cut out cow's milk dairy, gluten, excess carbs, and white sugar. Avoid foods high in pesticides, herbicides, preservatives, and artificial ingredients. Avoid fermented foods and leftovers, wine, smoked or preserved meat, if they cause symptoms. Eat in moderation – stop at 80% full. Avoid snacks and late night meals. Get the right amount of exercise, not too late before sleep time. Make sleep coincide with natural rhythms, in bed before 10:30, awake 7-8 hrs later. Avoid electronic screens 1 hr before bed, and turn off all lights at bedtime. Eat only organic foods or the least toxic conventional foods. Filter water. Avoid household and garden chemicals. Avoid plastic containers for food and water. Keep indoor air clean. Reduce physical and psychological stresses.

SNP's have their benefits. People with dirty genes with symptoms react to unhealthy situations before other people do, and they can be a warning to others who could have a dire result later on, cancer or sudden heart attack, etc.

What are the signs of a possibly dirty MTHFR? Hypothyroidism, low white blood cell count, infertility, children with autism spectrum or Down's syndrome, inability to tolerate certain medications, menstrual cramping and clotting, cold hands and feet, depression, high homocysteine, high B-12 or folate levels, intolerance to alcohol, not eating leafy vegetables, feeling better *when* eating leafy vegetables. The author lists 44 different health conditions that can be caused by a dirty MTHFR. Because the MTHFR is so basic and affects all the other genes, this is the one deserving most attention and care. Its main function is to manage methylation of many compounds, adding a methyl group where and when appropriate, to make them more functional or to detoxify them.

What makes a dirty MTHFR? Exposure to industrial chemicals, psychological and physical stress, hypothyroidism, inadequate methyl folate, methylcobalamin (B-12), or riboflavin, and taking a supplement of folic acid, a synthetic form of folate, which can block the folate receptor. To clean it, filter drinking water, eat many leafy green vegetables, get B-12 from fish, eggs, crab, clams, grass-fed animals, and vegans may have to supplement with choline and B-12. Allergies or sensitivities to cow's

milk and dairy can clog the folate receptors and the methylation cycle. Deep, restorative sleep and stress management are vital. No food with folic acid added. Avoiding chemicals and alcohol keeps the methylation cycle cleaner.

The COMT depends on the methylation cycle to methylate the neurotransmitters dopamine, epinephrine, and norepinephrine, and to keep them in balance, thus keeping moods and energy balanced. It also keeps estrogens in the right balance. A dirty COMT can be too fast or too slow. Too slow means accumulation of these hormones, with too much energy and excitation, trouble slowing down and sleeping, more sensitivity to pain, but also extra confidence and enthusiasm, and focus. Also metabolizing estrogens too slowly can mean fibroids, heavy menstrual bleeding, PMS, etc., but stronger bones. Too fast COMT allows more relaxation, “go with the flow,” lighter menses, no PMS, less pain sensitive, but also difficulty focusing and paying attention, tendency for depression, feeling need for caffeine frequently, and weaker bones. Chronic health conditions related to slow COMT include, among many others, coronary disease, anxiety, bipolar, breast and uterine cancer, Parkinson’s Disease, Schizophrenia, and stress related hypertension. Conditions related to fast COMT are osteoporosis, depression, learning disability, ADD, and addictive disorders, gambling, shopping, video games, drugs, and alcohol.

Things that make a COMT dirty, whether fast or slow, are insufficient nutrients, such as magnesium, folate, and B-12, and elevated homocysteine levels (related to MTHFR). Fast COMT is made worse by too much SAMe. Slow COMT is made worse by not enough SAMe, low homocysteine levels, excessive coffee, tea, chocolate, too many stress neurotransmitters, excess weight, or diet high in animal fat, causing buildup of estrogen.

So to support the COMT’s best function, whether slow or fast, optimize weight, avoid food’s contact with plastic, meditate a few minutes every day, go to bed and get up at a fixed routine, avoid using Roundup (glyphosate), phthalates, and dioxins, eat as clean as you can, eat beets, onions, and cruciferous vegetables to balance estrogen levels, eat a maximum of 3 meals a day, and de-clutter the home, office, car, and yard.

For slow COMT, monitor stress levels, develop ways to slow down, take deep breaths, rest when needed, take all the breaks, days off, and vacations coming to you. Exercise burns off the excess stress neurotransmitters. Reduce intake of caffeine if you’re feeling irritable or anxious.

For a fast COMT, to build neurotransmitters, get some high quality protein at every meal, avoid starchy foods, get enough sleep to give your body time to build dopamine, etc. Do brain-engaging fast activities like sports, dancing, etc., but don’t get too involved in video games, as they can be addicting. Hugs raise dopamine. Don’t rely on caffeine, even though it energizes.

The DAO gene produces the DAO enzyme, in many organs, which processes histamine. We need some histamine to respond to infections and injuries and to help the stomach produce acid, but too much results in problems. Histamine is produced by bacteria in the gut and by bacteria that live in fermented, cured, and aged foods.

A dirty DAO gene results in more allergic reactions, food sensitivities, migraines, indigestion, car sickness, itchiness, diarrhea, joint pains, ringing in ears, low blood pressure, difficulty sleeping, and leaky gut. Systemic histamine excess makes vulnerability to Parkinson’s disease and other neurological conditions. The dirty DAO can be caused from too much histamine overworking the DAO gene.

Some causes of excess histamine are too much histamine-containing foods, imbalanced colon bacteria or gut inflammation, overgrowth of bacteria in the small intestine, a diet that is too acid forming such as too high protein, gluten and other food sensitivities, emotional stress, and drugs, some of which are antacids, antibiotics, and metformin. High estrogen levels can promote excess histamine. Some high histamine foods are aged cheeses, alcohol, cured meats, fish, raw tomatoes, spinach, dried fruits, fermented foods, and citrus fruits.

To clean up a dirty DAO, optimize sleep and reduce stressors, support good digestion, stomach acid, and bile flow, avoid the causes of high histamine levels, eat alkaline forming foods such as green vegetables, beets, garlic, ginger, onions, lentils, sprouts, and sea vegetables. Eat foods that provide calcium such as kale, broccoli, sprouted grains and beans, lower-histamine cheese (goat or sheep), bok choy, okra, and almonds. Foods to provide copper include sunflower seeds, lentils, almonds, asparagus, turnip greens, and beef liver (organic, of course).

MAOA gene SNP's also can be fast or slow. This also governs moods, and a dirty MAOA can cause mood swings, especially if you also had dirty MTHFR and COMT genes. A slow dirty MAOA can result in anxiety, rage, trouble relaxing and falling asleep, headaches, mood swings, but also focus, confidence, alertness. A fast dirty MAOA can mean fatigue, flat affect, depression, carb and sugar cravings, ADHD, addictions, but also can have ability to calm down after stress, and to be easygoing.

Whether fast or slow, a dirty MAOA can result in many chronic neurological conditions, such as depression, bipolar disorder, migraines, OCD, Schizophrenia, autism, ADHD, addictions, IBS, and Parkinson's, since it affects the neurotransmitters so profoundly, especially serotonin, dopamine and norepinephrine.

Stress and inflammation can steal the tryptophan from food you eat from making serotonin, and diverts it to make quinolinic acid, toxic to the brain, and works against the MAOA's attempt to regulate serotonin. Stress also causes the MAOA to produce excess hydrogen peroxide, depleting glutathione, which is needed to protect against toxic chemicals and metals. Hydrogen peroxide also causes the hair to turn white.

The MAOA can be dirtied up by many chronic problems such as obesity, diabetes, cardiovascular disease, autoimmune conditions, cancer, and other chronic physical stresses such as infections, leaky gut, eating foods that are allergenic, excessive eating, improper breathing, and too little glutathione. Too much tryptophan or too little Vitamin B-2 (riboflavin) can slow the MAOA, and too little tryptophan or too much B-2 can speed up the MAOA.

So eating balanced meals with some protein, healthful carbohydrates, and healthful fats at each meal, avoiding sugars and processed foods, and managing stress to avoid the tryptophan steal, all help to support a healthy MAOA. Get tryptophan from spinach, seaweed, mushrooms, pumpkin seeds, turnip greens, asparagus, and red lettuce. Get Vitamin B-2 from mushrooms, spinach, almonds, eggs, and wild salmon.

Part II next month will cover the other 3 of the 7 major genes, GST/GPX, NOS3, and PEMT, and how to "spot clean" each of the genes after a thorough 2 week soak and scrub of all of them, some laboratory testing, and supplements.

Addendum: In last month's article on Food Fights and Flip Flops, I did not address the controversy about salt intake. Here again, it depends on many factors. People with hypertension, strong family

history of hypertension, metabolic syndrome, and diabetes type II are often salt sensitive, that is, salt can raise blood pressure and increase risks. On the other hand, people with adrenal insufficiency and low blood pressure (less than 100 systolic), may lack necessary aldosterone and may need extra salt. People with heart failure may be taking diuretics which expel fluid and salt, and severe salt restriction can lead to dangerous hyponatremia (low sodium). For the average healthy person with none of these risks, it would seem prudent to practice moderation, avoiding lots of processed foods and restaurant foods that are loaded with salt, adding a little salt to home cooked meals, but following the general guidelines for moderation in salt intake of 2300mg of sodium per day, which is approx 1 teaspoon of salt per day. Sodium should be balanced with potassium and magnesium, which are in in vegetables and fruit. Keep the overall perspective that the body loses potassium and magnesium easily because they are abundant in nature, and sodium and salt are scarce in nature, so the body would naturally try to hold onto salt. So we don't have to try extra hard to maintain enough salt in the body. It would then seem prudent to seek out what our natural ancestors ate, large amounts of plant substances, and to not overload with salt.