# Genetic Lifehacks

**Learn. Experiment. Optimize.**

## Member's Update

Hi everyone,

Ever had a doctor say to you: "Try this and see if it helps"?

It isn't that the doctor doesn't understand your condition or what the medication does, but rather that there is a huge range of genetic differences in how individuals break down and use medications.

The CYP family of genes is responsible for metabolizing many over-the-counter and prescription medications. These enzymes make up Phase I detoxification - the first pass through the process needed to make a substance ready to be excreted from the body.

Your 23andMe or AncestryDNA data can point the way towards understanding how your body may react to certain medications. But do keep in mind that the data isn't perfect and doesn't cover all possible CYP variants. Consider it a starting place, something to dig into if you are wondering why a medication isn't working  for you.  I do want to point out your doctor can order clinical-grade pharmacogenetic testing, and many find it very helpful, especially for quickly figuring out which antidepressant would work best.

~ Debbie Moon

## Phase I Detoxification Genes

---

**Check before taking Plavix**

### CYP2C19

The CYP family of enzymes breaks down both toxins and medications. Genetic variants in these genes can change the way that you respond to medications.

Learn how the CYP2C19 genetic variants impact your individual response to medications such as prilosec, Plavix, valium, and certain SSRIs.

View your genes

## CYP2C8

Medications that are mainly metabolized by CYP2C8 include[ref]:

- Cloroquine
- Repaglinide
- Rosiglitazone
- Piogliatozone
- All-trans-retinoic acid
- amidarone
- Ibuprofen (along with CYP2C9)
- Tenoxicam (along with CYP2C9)

View your genes

## CYP2A6

The CYP2A6 enzyme is involved in the break down of:

- nicotine
- tegafur (cancer drug)
- Letrozole (cancer drug)
- Efavirenz (antiretroviral)
- Artemisinin (antimalarial)
- valproic acid (antiepileptic, bipoloar, migraine med)
- Pilocarpine (glaucoma and dry mouth)

View your genes

Member's only report

## Detoxification Topic Summary

I've put together a topic summary report that covers how your genes match up to all the articles specific to phase I detoxification enzymes.  Check it out.

View your genes

---

## What I've been reading...

### Arsenic in your drinking water and epigenetics

Epigenetics is one of those terms that you see a lot on various websites -- often with a complaint that the person's MTHFR gene is expressing. There is a lot of confusion around the term in lay terms, and even in the scientific literature, the definition has changed over the past few years. In a nutshell, though, epigenetics refers to marking a gene for transcription or silencing the gene so that it isn't transcribed. Additionally, a gene could be transcribed into mRNA, but then stopped from being translated into a protein by a miRNA (microRNA) binding to it.

Arsenic is a known toxin at the right levels, but researchers have also found that lower levels of arsenic, such as are found in drinking water, increase the risk of cancer and diabetes. A recent article in Knowable magazine explains how the breakdown products of arsenic can epigenetically turn off genes involved in DNA repair, which help to prevent cancerous mutations.

### Number Needed To Treat and COVID vaccines

The 'number needed to treat', or NNT, is a statistical way to look at how effective a medication or intervention is for reducing a certain endpoint (e.g. heart attack or death). For example, theNNT.com website shows that for people who are at low risk of cardiovascular disease, the NNT for statins is 1 in 217 to avoid a non-fatal heart attack. This means that for every 217 people who go on a statin for high cholesterol, one heart attack will be prevented.

If you are interested in the number needed to treat for COVID-19 vaccination, here is an interesting NNT analysis based on the Israeli data. (Israel quickly vaccinated most of its older population in November and December, so the data from the vaccine is available for that age group.) The article gets a bit deep in the data, but essentially, for every 4,004 vaccinations, there will be one hospitalization prevented. Essentially, an NNT of 1 in 4004. This is based, of course, on the prevalence of COVID-19 cases this winter in Israel, so the NNT should be different for other areas where COVID-19 cases are lower or higher.

### TED talk on regrowing spinal nerves

This is a cool TED talk video about research on using asparagus - yes, literally the inside of asparagus- as a scaffold to regrow nerves in the spinal cord to reverse paraplegia.