**Results of my 1.5 years of injecting exogenous GDF11**

**Background**

Growth Differentiation Factor 11 (GDF11) has been cited in several papers as having an amazing capacity to restore aging muscles, hearts and brains in mice. It has never been tested in humans. Until now – I am patient zero for human GDF11 supplementation and this is my story.

Two important papers inspired me to give GDF11 a try to stop and potentially reverse aging. The first paper was <http://io9.com/are-limited-lifespans-an-evolutionary-adaptation-1710634703> which makes a strong case that lifespans are a product of natural selection, specifically group selection. It is actually advantageous for a species to have a preprogrammed lifespan and literally “die on time”. Especially if the species is in a harsh, resource limited environment.

I found the most compelling proof of programmed lifespan to be the table of rockfish lifespans on page 10. These rockfish, which are nearly genetically identical, have a huge variance in lifespan. The Rougheye rockfish lives 205 years, while the Calico rockfish lives only 14 years. If you Google these rockfish species, the reason for this large variance will become obvious. Hint: The Rougheye lives in deep, stable ocean waters with plenty of crab, shrimp, etc. to eat. The Calico lives in shallow waters off the coast of California, which are much more volatile.

Based on the above as well as parabiosis experiments (see www.nature.com/news/ageing-research-blood-to-blood-1.16762), odds are there are substance(s) in the blood that regulate lifespan.

But what are these substances in the blood?

That’s where a second key paper comes in from the Harvard Stem Cell institute:

[Summary: hsci.harvard.edu/news/functioning-aged-brains-and-muscles-mice-made-younger](http://hsci.harvard.edu/news/functioning-aged-brains-and-muscles-mice-made-younger)

Full paper: www.sciencemag.org/content/344/6184/649

The Harvard paper states that the atrophy of muscles as we age is caused by DNA damage in our muscle stem cells also known as “satellite cells”. Once a satellite cell’s DNA is damaged, it goes “offline”, produces no new muscle cells and eventually dies. A declining population of satellite cells leads to less new muscle cells. Which is why the young mice mentioned above can exercise for an hour and the old ones can barely make it 37 minutes. But GDF11 supplementation put the old and young mice on equal footing when it comes to exercise.

Other papers have found similar issues with older brain and heart stem cells. GDF11 was able to repair these stems cells resulting in increased neurogenesis and cardiac function.

Though no paper has explicitly stated this, it is likely that all stem cells in the body suffer DNA damage, which is not repaired as GDF11 levels drop. This lack of repair usually does you in by 80.1 years on average. A big part of aging is literally the shutdown of the body’s most important repair mechanism, stem cells.

**Risks of Taking GDF11**

I believe I am the first human to inject GDF11. It was definitely a risky proposition, but so is letting aging take its course.

The papers above definitely make compelling arguments for giving it a try. Plus GDF11 is endogenous – we all have at least some GDF11 in us. I certainly would rather take an endogenous protein, than try a manmade compound.

Another thing to look at when evaluating the safety of GDF11 is organ transplantation. Organ transplants from older to younger people (who obviously have higher GDF11 levels) are common and there have never been any issues, outside the usual tissue rejection issues.

In fact, an old organ put into a young person sees considerable rejuvenation. This proves on some level that upping serum GDF11 levels is not dangerous.

The most dangerous endogenous proteins/hormones in us are thyroxine and insulin. Too much of either can kill you in minutes. However, taking ug (micro gram) doses of thyroxine/insulin won’t kill you. If one starts with ug doses of an endogenous substance and drops the dose when there are side effects, the risk is minimized.

Another interesting thing about GDF11 and another reason I took it, is that its molecular structure is conserved across all vertebrate species. Which proves how important it is to life, as well as how early it showed up in evolution.

**Dosing GDF11 and side effects**

One can easily tolerate fairly large doses of GDF11 in the beginning. I started with 50 ug, got side effects in a week, cut dose by half, got side effects in a week, cut dose in half again, etc.

The side effects of excessive GDF11 are dyspnea (shortness of breath) and acid reflux, also known as GERD. These are not terrible side effects – the dyspnea might last for 30 seconds, but still pretty unpleasant.

GDF11’s dosing curve is asymptotic and it down regulates fairly quickly. And GDF11’s dosing window is very narrow – too much and you get GERD and dyspnea. Too little and it does nothing. The key is to take a dose that is slightly below the dose that results in side effects. Which is not easy in the beginning as you follow the asymptote down.

Now I only take .1 ug every other day, which is an infinitesimal dose, but it still has plenty of efficacy.

One could try just starting with a small dose of .5 ug/day. It may take you longer to see GDF11’s benefits, but the odds of side effects are greatly reduced. And remember, if you get side effects, stop taking GDF11 for a week and restart with half the dose. Less is more with GDF11.

**Key Biomarkers on GDF11**

The Harvard and other GDF11 papers state that GDF11 brought about dramatic improvements in cognitive, cardiac and muscle biomarkers. So we will start by looking at these three key areas in myself. Note that I began taking GDF11 on June 6, 2014. And my birthdate is March 20, 1958.

**Cardiac**

In the attached zip file named “GDF11 back up data.zip”, read the PDF entitled “SphygmoCor”. Note on page 2, my SphygmoCor Reference Age is between 28 and 34.

Also, note the bottom right of page 4: big improvements to the key cardiac biomarkers of injection duration (how hard the heart is pumping – lower is better) and Buckberg SEVR (oxygen supply to heart – higher is better).

In the zip file, note two CIMT PDFs taken 9 years apart. Carotid artery thickness is closely correlated to coronary artery thickness. Lower is better. Within 9 years, I went down from .681 mm to .633 on mean IMT.  And down from .809 to .731 on Max IMT.

GDF11 does appear to have remarkable cardiac repair abilities. If you have congestive heart failure, which is not curable, giving GDF11 a try is probably worth the risk.

**Cognitive**

Several papers proved that GDF11 stimulates neurogenesis, by analyzing slices of a mouse brain after 6 weeks on GDF11. I’m dedicated to anti-aging, but this is where I draw the line. I will not be parting with any brain samples anytime soon.

However, a good biomarker for cognition is reaction time – reaction time declines linearly with age and there is nothing you can do about it.

However, on GDF11 I was able to improve my reaction times significantly. In the zip file, note the 2014-04-14 - CNS Vital Signs Report at the top shows pretty dismal reaction times of 5th percentile.

The post GDF11 2015-05-26 - CNS Vital Signs Report shows a much better reaction of 37th percentile.

**Muscle**

The Harvard GDF11 paper states that GDF11 restored muscle stem cells and therefore muscle tissue. Here I will present my body composition numbers from an In Body scale which you can read in the zip folder. Pre GDF11, I had lean body mass of 154.8 lbs. Post GDF11, I added 5 lbs. of lean body mass bringing me to 159.8 lbs. of lean body mass. I did not change my workout regimen or diet one iota.

Unfortunately, my body fat did not go down. This is probably due to the fact that other blood born peptides are necessary to affect this. More on this below.

**Skin**

Skin age and elasticity had been not discussed in any GDF11 paper. Though skin stem cells, known as epidermal stem cells, are surely repaired by GDF11 also.

My skin did improve considerably for me under GDF11. Pre GDF11 cutometer based “CutoAge” was 57.3 years. CutoAge went down to 42.6 years post GDF11 supplementation. Skin elasticity went from 60.7 pre GDF11 to 72 post GDF11 (higher is better). And this is obvious from just by looking at me.

**Immune**

The immune system was also not discussed in the Harvard paper, but I have pre and post GDF11 immune data, so I am including it (see UCLA Immune Results). The results are inconclusive: CD4/CD8 ratio up from 2.87 to 3.06. But other key immune biomarkers like naïve T cells are down. I will let the immune experts weigh in here, but it may be too early to tell.

**Other Observations**

These do not have hard numbers associated with them but I thought they were worth mentioning:

Endurance

This could be the best part of GDF11 – you have great endurance and don’t get winded when taking the right dose. I am a big fan of backpacking/camping. In recent years, I found myself stopping my hike and sitting on any log/rock that looked comfortable. Now I can hike up a mountain nonstop for hours. I did more backpacking this summer than I ever have because it felt easy and fun again.

I have also noticed that I sweat a lot more on GDF11, which is beneficial.

Vision

My contact lens prescription for nearsightedness has gone down by half a diopter in both eyes. Not sure how common this is, or whether GDF11 gets credit for this or not.

Another thing I’ve observed about GDF11 is what I call “super high resolution vision/red light effect”. Usually in the afternoon, my vision gets very sharp. And when I look down Broadway in NYC, I see the red tail lights of the cars very prominently. Kind of like a Photoshopped photo where they put on a filter to accentuate the red lights. If I stop taking GDF11, this disappears in a few days. Not sure what the mechanism of action is here, but I doubt this is a bad thing.

Gray Hair

Had some gray hair prior to GDF11 supplementation, now I have very little. This is probably due to GDF11 increasing melanocyte production.

Prostate issues

As most men in their late 50’s will tell you, getting up a few times in the middle of the night to urinate becomes the norm. However, after a couple of months on GDF11, I was able to sleep through the night. Big win for GDF11 right there.

Verbal Ability

I find I can write and speak faster and am more eloquent on GDF11. This can probably be measured somehow and is surely due to increased neurogenesis brought on by GDF11.

Smell

Another good biomarker of increased neurogenesis, is smell. And my sense of smell has increased dramatically. Future GDF11 recipients might want to take baseline and post GDF11 olfactory tests.

**Is GDF11 the master regulator of aging?**

I would say that GDF11 is a big piece of the aging puzzle, but not the whole thing. If GDF11 were the master regulator of aging, then we’d have “outlier” humans with mutations to the gene that encodes for GDF11 located on chromosome 12.

One mutation could easily be never dropping GDF11 levels that would allow these individuals live hundreds of years like the bowhead whale (also a mammal like us) does. Needless to say, we have not observed this. The longest proven human lifespan was Jeanne Calment, who lived 122.4 years.

Note that my IGF-1 levels did NOT go up at all on GDF11. A reasonable guess as to what else is necessary for radical life extension would be replacing the pituitary hormones of GH, LH and TSH.

**Conclusion**

Even though the above is only a study of one, it does show some nice results. And it shows that GDF11 is probably safe in the .5 ug or less dose.

For those who say a study of one is not worth much, let us not forget the many individuals in medicine who have taken risks and saved thousands of lives. Take Barry Marshall, who theorized that the bacteria H. pylori caused peptic ulcers and gastric cancer. He was widely ridiculed by the medical profession, most of whom believed no bacteria could survive stomach acids. To prove his theory, he actually drank a petri dish of H. pylori, got quite sick and developed gastritis within 8 days. He proved his hypothesis, and cured himself with antibiotics. And hundreds of thousands of peptic ulcer patients have since been cured with Barry Marshall’s antibiotic regimen.

Barry Marshall won a Nobel Prize for his work in 2005.

I’m not looking for a Nobel Prize, but am hoping to jumpstart the GDF11 research process in humans. I have shown that GDF11 is reasonably safe, so perhaps we can soon start helping people with everything from congestive heart failure to Alzheimer’s. We obviously need more people to try GDF11 with comprehensive before and after biomarkers. And put the results in a database and look for trends (my specialty). If you are interested, please email me at [steve@stevegperry.com](mailto:steve@stevegperry.com) and let’s exchange data and ideas.