One (Biotech) Ring to Rule Them All

John Mauldin | November 17, 2012

One Ring to rule them all,
One Ring to find them,
One Ring to bring them all and
In the Brightness bind them

(with apologies to JRRT)

The world appears fixated on the fiscal cliff. And indeed, I have been shooting a video here in NYC all day with my friends (the usual brilliant suspects, et al.) on how the world looks after the election. And to say that my close-up interview/conversation with the chiefs of staff of Majority Leader Harry Reid and Senator Rob Portman (David Krone and Rob Lehman, respectively) had more than a few blockbuster moments is an understatement.

Everything is in editing as we speak. You get the good parts without the other five hours of total time we shot. (Which is why you don't want it truly live. You just don't have the time or patience. I do value your time!). But the entire tape of the DC session will be available. Want to know what the true insiders think, raw and unfiltered? The guys who have been talking for weeks before the election about what to do now? You can watch the whole thing when it goes live next Tuesday. Click on this link to make sure you get the signup instructions sent directly to you.

Now, for today's Outside the Box I want to get *way* outside the box and look to the future and what is most important about it: our lives and our health. I assigned my good amigo Pat Cox of *Breakthrough Technology Alert* the task of picking the three most transformational happenings in the biotechnology world today. Out of a candidate list that included scores of topics, it was tough for him to narrow it down to just three. If I had let him, he would have given me his top 20. There is just so much happening. But he did winnow the field and sent me the following piece, written in his own compelling style. I have already read it twice and will file this one away to read yet again. Pat is my "go-to-guy" on new tech (and not just biotech, but that is where the edge is lately).

I don't do this often, but if you like what you read and would like to follow Pat as I do, you can subscribe to his service here. I have not seen the link but assume it is a risk-free trial. His service is not cheap, but I really rely on it to keep me surfing along the edge of the future. It is a great antidote to the depressing news about governments and deficits and taxes.

The three technologies/companies that Pat writes about are controversial. Traditional metrics would ignore them. No earnings, having to constantly raise cash, etc. In other words, start-up

biotech companies. These stocks are not for the faint of heart. They are not stocks you should buy if you check your portfolio once a day or even once a month! And you should not buy them based on this very short analysis. DO YOUR HOMEWORK! If you are looking for a 10% move, then just don't. Biotech stocks are not for stock jockeys.

Indeed, after this article was written, important news broke (today!) about two of these companies. BioTime CEO Dr. Michael West yesterday signed a letter of intent to acquire Geron's massive portfolio of stem-cell-related patents. Because Geron was the pioneer in stem-cell development, hundreds of the basic technologies in the field were invented and patented by the company. No one knows the value of Geron's patent portfolio better than Mike, because he founded Geron and was the creater of most of the patents!

If the current leader in this area, BioTime, consummates this deal to bring most of the critical stem-cell IP into one organization, it would be a huge leap for regenerative medicine. This kind of consolidation is typical in maturing biotechnologies, because former competitors find they can move forward together faster than they can separately. This move by BioTime brings us closer to One Ring to Rule Them All in the stem-cell world, but instead of the darkness of Mordor it portends a very bright future for mankind, as Mike is driven like no other man I know to bring the benefits of stem-cell technology to a medical provider very near you. His obsession is your future life-saving/enhancing medicine.

BioTime has for some years been the target of constant short attacks, some of which I frankly consider unethical and even bordering on fraud. The culprits short the stock and then write load up the usual stock websites with half-truths, outright lies, and very bad "research," trying to convince current owners to sell and others to short, covering their own shorts on the movement they create. Sadly, it works. This is the opposite of pump and dump, but if you play that game you lose. Note that NONE of the critics understand biotech, have any serious credentials, or are regulated. They operate mostly in a very shadowy world. Just look at the long list of *serious* people who are involved with BioTime. Then ask who the hell their critics are and who is advising them. And realize they are covering their shorts when you sell.

Note that biotech stocks are particularly vulnerable to this sort of scam. They are almost all burning through mountains of cash in the pursuit of some dream. Many of them do indeed crash and burn before they get to a safe landing. It is a world fraught with danger; but as with gold stocks, if you find the mother lode you can be in for a very pleasant experience. Do NOT invest in biotechs without doing a lot of homework. That being said, I think it is one of the most exciting spaces of the future. We are just at the beginning of a biotech revolution that will astound and amaze. Enough said.

Star Scientific has also been targeted by these forces of darkness. Most recently, the bad guys have claimed that the company is out of money and in financial trouble. CEO Jonnie Williams and a few of his friends exposed that lie yesterday by injecting $20 million of their own money into the company, exercising warrants, and covering expenses for probably more than a year. Is Star losing lots of money each month? Clearly, but Williams and friends put in almost two years of "burn rate." There are VERY deep pockets who are true believers. You may or may not like the technology, and you can argue the business model, but don't doubt

this company's ability to raise cash or the passion of its management. You can debate the value of the company but not its cash reserves or commitment. Click here to learn more.

It is time to hit the send button. I am a little tired, but it's a good exhausted. I spent the day with Jim Bianco, Mohamed El-Erian, Barry Habib, Barry Ritholtz, Gary Shilling and Rich Yamarone. We analyzed the future in a fast-paced, energetic, and intense (though friendly) manner. It was an adrenaline rush – and you get to share it. I am off to my room to slow down for the evening before I fly back in the morning. Then I'm home for ten days, where I hope to get into the gym almost every day. I miss my gym more than my own bed, actually. Have a great week, and sign up for the Post-Election Summit – then give me your feedback.

I see family and turkey and prime, mushrooms and cakes and pies in my future. On Wednesday, I forget about economics and become a world famous (to my family and friends) chef. I will immodestly state that I make a wicked prime, and no one has ever had my mushrooms without saying they are the best. They are not an item in your heart-friendly diet, but they are worth every artery-clogging calorie. Have a great week and enjoy your family and friends. I know I will.

Your not so humble about his cooking analyst,

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Three “Unbelievable” Biotech Discoveries

Our esteemed host gave me a seemingly simple assignment: “Write about three recent breakthroughs in biotechnology.” While simple in concept, the task is challenging in practice.

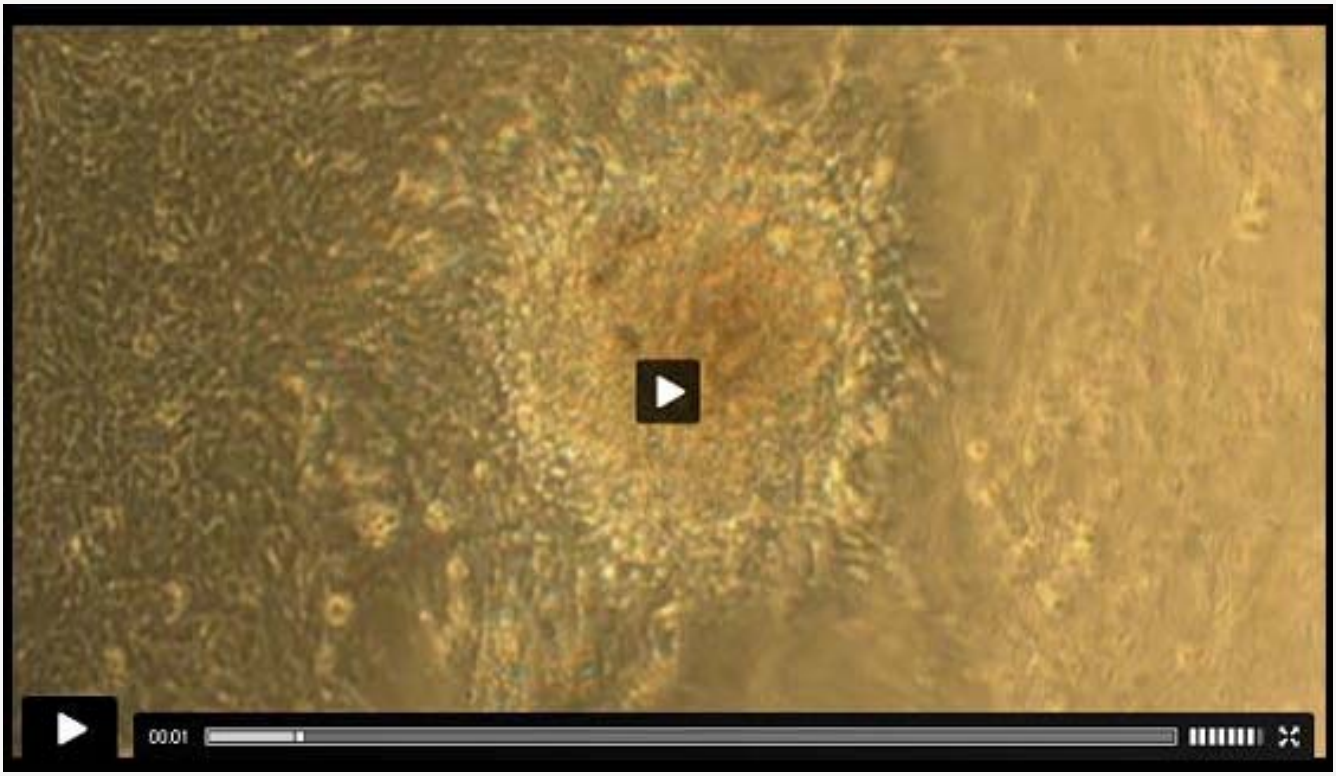
First, there have been so many important developments in recent months, it's painful to narrow the field to only three. Moreover, the three that I finally settled on are such radical departures from the past, most people have trouble accepting such unfamiliar concepts. I also readily admit that it's not easy to duplicate my research because most of it comes through direct contact with the relevant scientists. To the extent that their technologies are being written about, it is only in specialized scientific journals that are, for most people, inscrutably recondite.

Typically, when I introduce people about these technologies, the normal response involves the word “unbelievable.” The word no longer means something that can't be believed. Rather, it's morphed into an expression of astonishment. Nevertheless, I understand that all radically new scientific discoveries meet with skepticism. So I normally spend a lot of time and space explaining why a technology can and should be believed.

This forum, however, requires stark and daunting brevity. My challenge, therefore, is to summarize “unbelievable” biotechnologies in only a few pages that I've written enough about to fill a book. It's impossible, however, to give you enough information in a “column” format to truly explain the science behind these discoveries. My goal, therefore, is modest; that these brief introductions may at least pique your interest and get you thinking about the consequences of dramatic biotech discoveries.

To that end, I'm giving you paper-thin overviews of three breakthroughs that nobody, to my knowledge, predicted. One is the world's first oral nanomedicine. Another is a new nutritional supplement that probably saved my life. It is also rewriting everything we thought we knew about normal aging and disease. I'll start, however, with the most important development yet in stem cell medicine. I'm not talking, by the way, about the obsolete technology that won the Nobel prize in physiology and medicine this year.

To emphasize how advanced stem cell medicine really is, let me show you a video, slightly looped, of my fully rejuvenated heart cells beating in a flask in Northern California. I'll have more on those cells in a bit.



The SP100 (100% Super Power) Gene Discovery

Okay, the "SP" doesn't actually stand for super power. That's just the mnemonic I use to remember the name of the SP100 gene. In fact, SP is probably an acronym for the rather boring "soluble protein." The "100" is less mysterious because the protein expressed by the gene has a mass of 100 kilodaltons. Nevertheless, I think it's fair to say that the SP100 gene gives stem cell scientists "super power" over the entirety of your DNA.

Until very recently, very little was known about this one of about 50,000 human genes. Two organizations, however, made independent discoveries that, combined, led to a breakthrough critical to the development of stem cell therapies. The two organizations are BioTime, Inc (NYSE: BTX) of Alameda, California, and the Philadelphia-based cancer and vaccine research group, the Wistar Institute.

The BioTime side of the story came out of exhaustive genetic analysis and comparison of the proteins expressed by active genes in hundreds of cell lines, both cancerous and normal. Many genes never previously associated with cancers were discovered, which has led to a radically new diagnostic technology. Like PSAs and other single cancer diagnostics, the test will require only a drop of blood and a biochip – but it will allow extremely precise diagnosis of most if not all major cancers.

This inexpensive pan-cancer diagnostic will, I believe, enable inexpensive and early detection of many cancers that currently develop into life-threatening malignancies. This, in turn, will significantly reduce cancer mortality rates and costs. Dr. Andrew von Eschenbach, ex-FDA chief and former head of the National Cancer Institute, joined the BioTime team as a result of this

diagnostic technology which is moving rapidly through the European regulatory process for medical devices. It is one of three BioTime technologies on track for clinical testing next year.

I don't consider the diagnostic device the most important outcome of BioTime's gene analysis research program, however. That, I believe, was the discovery of the SP100 gene's role and applicability to regenerative medicine.

The clue that led to this breakthrough was the fact that the protein expressed by the SP100 gene was absent or deactivated in all cancers. To borrow a metaphor from Arthur Conan Doyle, SP100 was the dog that didn't bark. The clear implication was that cancers block SP100 gene activity so they can reprogram healthy cells.

This led BioTime CEO Michael West to work done at the Wistar Institute. Wistar, incidentally, is where the biological clock of aging, telomeres, was discovered by Dr. Leonard Hayflick. Telomeres are the disposable caps on the ends of our chromosomes. One telomere is used during each cell replication when the double helices of our DNA split apart to copy themselves and then rejoin. When our cells run out of telomeres, they stop replicating. Before then, however, shortened telomere caps cause age-related conditions.

In certain cells, this shortening doesn't happen. Telomeres are continually replaced as they are used so these cells don't age. The two most important are embryonic stem (ES) and induced pluripotent stem (iPS) cells, but cancers also exploit this mechanism. In these cells, telomeres are constantly replenished by the gene which expresses telomerase. When ES or iPS cells begin the transition to a specific adult cell type, the telomerase gene turn off. Then, they begin to use up their telomeres and age.

Critically, this process can also be reversed. Old cells, like mine, can be made young again by reactivating the telomerase gene. BioTime, though, is developing the processes to reprogram ES and iPS cells to become different adult cell types. Patents on hundreds of cell types have already been filed for. The video above demonstrates just one of those cell types.

BioTime took skin cells, fibroblasts, from inside my left tricep, leaving a slight scar. These skin cells were converted to iPS cells identical to the embryonic cells that I came from. I donated my cells to BioTime, incidentally, for research purposes. Then, just to make a point, they were programmed to become heart muscle cells, which you can see in the video linked above.

Heart muscle cells were chosen because they spontaneously self-assemble into little beating clumps for instructional purposes. You don't have to be a cellular biologist to recognize them for what they are. Keep in mind that the cells in that video are completely rejuvenated. They have the same full count of telomeres that my heart cells had when I was an infant.

Also, because they are my own cells with my own DNA, I could receive them via transfusion without triggering an immune response. In fact, I would happily do so if the authorities allowed.

Several recent studies have shown that young stem cells with DNA matching the recipient have widespread rejuvenating effects. This is probably due to the youthful growth and signaling factors these stem cells release.

The iPS technology obviously opens up vast potential to treat medical conditions by restoring cells to youthful health. These conditions range from joint problems and blindness to heart disease and

diabetes. Eventually, it will be possible to rejuvenate and extend the life span of every cell in your body. BioTime's subsidiary, Recyte Therapeutics, is now working on the production of patient-specific stem cells to cure our number one killer; age-related cardiovascular disease.

As you read this, your endothelial precursors stem cells are constantly repairing your cardiovascular system. Their ability to do so, however, diminishes as those cells age. With a transfusion of a patient's own rejuvenated endothelial precursors, the recipient would have a rejuvenated cardiovascular system within months.

Though BioTime doesn't have regulatory approval yet, the company has been able to perform this procedure on a limited basis for some time. The process of creating rejuvenated iPS cells for individuals, however, is slow and therefore expensive. Cells resist reprogramming because most of the DNA in adult cells is purposely folded up and protected from activation.

It is possible using the virus-vector technology, which was honored with a Nobel prize this year, to create iPS cells. Viruses can penetrate and reprogram the folded portion of genome, but it's an extremely slow and inefficient process. This is where the Wistar Institute's research comes into the picture.

Looking for causes of cancer, Wistar Institute researchers turned off specific genes, including SP100. The SP100 experiment didn't yield cancer but it produced cells that resembled embryonic stem cells. BioTime CEO Michael West understood the true significance of the Wistar experiment and extensive collaboration followed. I consider the result the most important breakthrough in stem cell medicine yet.

In essence, the SP100 gene produces the protein signals that keep our DNA folded in adult form. As you know, every cell in our bodies contains the entire genome, but only some are activated. We don't want, for example, tendon genes accidentally activated in our eyes. SP100 gene activity keeps our cells locked in one state. Normally, the SP100 signals are turned off in adult cells only when the cell needs access to the entire genome – during replication.

Administrator Privileges to the Genome

What this means is blocking SP100 gene activity in adult cells opens up the part of the genome that is normally locked down. This allows much more efficient genetic engineering. For those of you who understand computer operating system, I like to think of the SP100 gene as a security system or anti-virus program that prevents unwanted changes in the cell's DNA or operating system. Normally, your computer OS is protected from alteration. When you want to upgrade your OS, you need "administrator privilege" to make those changes.

Controlling SP100 gene expression gives stem cell scientists administrator privileges to the genome. It will enable fast, cheap automated large-scale production of iPS cells from adult cells. It means that you will be able to donate some skin cells, as I did, and they can be robotically turned into the equivalent of the embryonic cells that you came from. Then, they can be turned into the healthy youthful version of whatever type cell you need, without immune rejection issues. The implications are staggering.

Before telling you about a nutraceutical more powerful and useful than many blockbuster drugs, I'd like to update you on the nanomedicine front.

The First Oral Nanomedicine and Cure for Influenzas

I've written here before about the convergence of nanotech and biotech at NanoViricides Inc. This company's technology platform is the marriage of submicroscopic polymer structures, or nanovesicles, with even smaller biological signaling molecules called ligands.

Most people following nanotech progress have looked to physicists for the tools to build nano-sized structures and machines. Largely unnoticed, however, biochemists have taken an alternate route, exploiting the atomic-scale tools provided by nature. The scientists at Nanoviricides have used these tools to produce precisely-shaped submicroscopic polymer nanovesicles. To these constructs they attach biological ligands.

As background information, ligands are extraordinarily sophisticated molecules essential for life. They can bind with other biological molecules, using electrostatic attraction and other forces. When they do, they produce signals that are used for a vast array of biological functions.

You don't really need to understand ligands in depth but you do need to know that invading viruses use specific ligands to identify their target cells. Different viruses recognize different ligands but all viruses, once they've found their target ligands, enter the cells they are attached to. Once inside, viruses hack cells' DNA to make more of themselves.

NanoViricides scientists, led by Dr. Anil Diwan, have identified the ligands that attract specific viruses. They attach huge numbers of these ligands to their synthesized polymer virus traps.

A picture may be more helpful than words. In this artist's representation of a nanoviricide, the spherical structure is the polymer nanovesicle and the green and pink objects on its surface are ligands.

When viruses detect their target ligands attached to the polymer nanovesicles, they act as if the nanovesicle is a cell. Viruses force their way into the polymer structure and attempt to hack the nanoviricide as they would a living cell. With no genome to exploit, they are disassembled harmlessly.

These nanoviricides are as notable for what they do not do as what they do. They do not modify cell biology, as do traditional drugs, to fight viruses. Nanoviricides are far more simple. They work outside the cells in the blood stream, the virus's transport system. Because their mechanism of action is more mechanical than biochemical, they are not metabolized by the liver.

This explains just-released data regarding their astonishing lack of toxicity (to mammalian cells). Instead, they are toxic only to virus, which they disassemble wherever they meet them. In a real sense, the molecular forces and shapes utilized by nanoviricides qualify them as true and nanotech machines.

Recent studies using both animals and human cell cultures demonstrated how amazingly efficient this technology is. Tests in humanized animals showed that NanoViricides broad-spectrum influenza drug, FluCide, is orders of magnitude better at killing influenza viruses, including the really dangerous ones, than the current best flu drug.

All that I've just told has been known for some time. Here's what's new and exciting.

The Oral Breakthrough

Because nanoviricides are relatively large compared to small molecule protein drugs, I assumed they could only be delivered via injection. Injectable drugs, however, are problematic. They must be administered by medical professionals, raising costs significantly and slowing treatment. Especially in a flu pandemic, this could make a life-and-death difference for millions of people. Additionally, oral drugs for a previously unseen mutation could be designed, manufactured and distributed much faster than an injectable.

Recently, however, NanoViricides demonstrated that they can design, using certain polymer shapes and ligands, a drug that passes safely through the stomach lining into the blood stream. It may not be evident today, but this is a discovery that will be recorded in future medical history books.

Oral nanoviricides will allow low-cost preventative dosing for influenza, but the implications are much greater. I believe the company is on track to solving the oral delivery problem for other virus-borne diseases. Soon, I'm convinced, we will see oral nanomedicines that cure or completely prevent symptoms of AIDs, herpes, hepatitus, smallpox, dengue and other diseases.

Now, lets talk about a nutraceutical that is forcing wide-scale re-examination of normal aging processes.

Treating Autoimmune Disorders with a Natural Supplement

Let me begin by saying that I don't blame you if are skeptical about what I'm going to tell you now. It took me six months to come to grips with the reality and the magnitude of this discovery, despite plenty of solid research from world-class scientists. Finally, I did two things. I talked to scientists at the Johns Hopkins Medical School and the Roskamp Institute, and I began taking the supplement and giving it to friends and family.

A big part of my skepticism came from the fact that this is a "natural" product, a nutraceutical. I've seen so much junk science come out of the healthfood store subculture, my prejudices against anything with a nutraceutical label ran very deep.

Having accepted the possibility that a natural substance might actually outperform drugs, I was led to the work of respected Prof. Claudio Franceschi who founded the Laboratory of Immunology the University of Bologna, Italy. Franceschi developed a theory of accelerating aging that he termed "inflammaging." His work is widely available on the Web but I'm going to give you my very abbreviated take on his work.

Until mid-20th Century in the Western world, the most hazard time in a person's life was birth and the following months. Economic progress and medical advances have changed that but we all come from lineages that have one thing in common. Our ancestors' immune systems were fully

activated from their very first moments to fight injury and infection. If it were not so, they would not have survived to pass on their genes to you.

What worked for much younger populations in earlier times, however, is a major problem today. Your immune system is on constant high alert, ready at a moment's notice to mount an "inflammatory response" to infections or injuries common only a century ago. The highly tuned immune system you inherited from your ancestors is not equipped for less hazardous times. I think of our immune systems as guards suffering from sleep deprivation and a caffeine overdose with with their fingers on hair-triggers.

Our immune systems are designed to over-react because, in the past, a false alarm was far less dangerous than a weak or delayed response. We see evidence of this in young people who have allergies. It's not the pollen or the peanuts that make people sick, it's their own overreacting immune systems. As we age, the immune system misfires more and more often and the resulting cellular damage provokes even more inflammation. It's a vicious accelerating circle that contributes to all diseases.

Inflammaging

In the paper "Inflamm-aging: An Evolutionary Perspective on Immunosenescence," Franceschi and his team point out "... that the persistence of inflammatory stimuli over time represents the biologic background (first hit) favoring the susceptibility to age-related diseases/disabilities. A second hit (absence of robust gene variants and/or presence of frail gene variants) is likely necessary to develop overt organ-specific age-related diseases having an inflammatory pathogenesis, such as atherosclerosis, Alzheimer's disease, osteoporosis, and diabetes."

In other words, you may have a genetic predisposition to atherosclerosis, Alzheimer's disease, osteoporosis or diabetes but it is your own immune system that triggers these conditions. Many researchers studying this phenomenon have focused on NF-κB, nuclear factor kappa-light-chain-enhancer of activated B cells, as the root cause of the problem.

NF-kappa, as it is often abbreviated, is the alarm system of our immune system. NF-kappa is a transcription factor capable of activating your DNA to mount an immune defense. They exist outside of the nucleus in virtually every cell in your body but, if they detect something indicating injury or infection, they migrate into the nucleus and initiate an immune response.

As we age, NF-kappa calls in more and more false alarms until we are in a state of chronic low-level inflammation. Eventually, this chronic inflammation tends to localize at some point of vulnerability until we have a health-threatening disease that ends our lives prematurely.

For this reason, the quest for a substance that would calm down NF kappa activation without suppressing legitimate immune system function has been called the "holy grail" of modern medicine. To make a long story short, that holy grail has been found in members of the solanaceous plant family such as eggplant, peppers and tobacco.

In fact, this alkyloid was discovered while searching for an effective smoking cessation aid. Researchers have long known that there's more in tobacco that leads smokers to smoke than nicotine. This was obvious due to fact that smoking has a powerful and pleasurable calming effects, via MAO inhibition, that nicotine does not provide. Moreover, despite the clear dangers of smoking, the tobacco plant has known medicinal values.

Jonnie Williams, the CEO of a company dedicated to lessening the harm of tobacco, Star Scientific (STSI), discovered that extra ingredient. After spending years and millions of dollars to find a safe food form of the substance, he proved safety with two years of Harvard University toxicity studies. Then, he put smoking cessation mints containing his anatabine citrate on the market.

Almost immediately, people began posting reports online of improvements in a variety of inflammation-related conditions. Intrigued, Williams took his substance to several important research organizations, including The Roskamp Institute and the Johns Hopkins Medical School.

Personally, since I began using the supplement two years ago, I've seen remarkable improvements in health. Due to a bad car accident while in college, I was far into the inflammaging death spiral. Tibial periostitis (shin splints) kept me even from walking distances. Severe cervical arthritis had left my right arm mostly unusable, making most upper-body exercises nearly impossible. Within months, both conditions were significantly improved. After two years, I have no symptoms. As a result, I was able to begin running and lifting weights again.

Additionally, my seasonal allergies, while still occasionally evident, no longer take me down. The same is true for my family and many of my friends. My optometrist was surprised to find that sight in my right eye, lost through trauma-induced glaucoma, had improved. I've dropped more weight than I care to admit and my numbers are all better.

Many others, including golfer Fred Couples, have also found life-changing relief from serious inflammatory conditions. Jonnie Williams wife's thyroiditis, on the verge of surgery, reversed and no longer bothers her.

I could go on and on, but anecdotal stories such as these are not valid scientific evidence, though I've heard scores of even more remarkable accounts from the research scientists themselves who have given the supplement to friends and family. Even the dramatically successful results that have come from humanized animal studies are not proof that this natural compound, found in the over-the-counter nutraceutical Anatabloc, will work similarly in humans. The conditions we've seen improved in animals include, by the way, Alzheimer's, thyroiditis and multiple sclerosis.

Unbelievable, right? I understand. So I'm not telling you to trust me or take the product.

Rather, I'm telling you to watch for final data from three major studies underway now. The Roskamp Institute, a leading brain disease research center, is doing the Alzheimer's trials. Roskamp, directed by two of the scientists who discovered the amyloid connection to AD, Drs. Michael Mullan and Fiona Crawford, has also overseen an interventional study in Flint Michigan. Dr. Paul Ladenson, with colleagues from Johns Hopkins is following up an animal study of thyroiditis with a human study.

Preliminary results from the Flint study have been released, revealing that the active ingredient in Anatabloc, at much lower doses than I take, reduced C-Reactive Protein (CRP) levels in 61% of diabetic patients. CRPs are associated with the onset and severity of diabetes and other diseases. These patients, in fact, all had other diseases and extremely high CRPs so results are far more significant than they may appear.

The Hopkins thyroid study results should be completed in December but we already know that the human studies are providing statistically significant results. If they are similar to the animal studies, which provided the first ever improvements in thyroid disease, we will be able to reach

extremely important scientifically validated conclusion.

In fact, positive results from all three ongoing studies would confirm the thesis that anatabine citrate does not treat specific diseases directly. Rather, it dramatically reduces the NF-kappa induced inflammation that effects all diseases. If this is true, and I'm personally convinced that it is, it means that we will be able to delay or prevent most of the conditions that prematurely shorten life.

I won't tell you how much longer I think we'll live, because you wouldn't believe. I will say, however, that the impacts, both positive and negative, on programs such as Social Security and health care as well as the medical, housing insurance and other industries will be "unbelievable."

Incidentally, scientific validation for this unregulated nutraceutical comes at the perfect time. The public is losing faith in old-school pharmaceuticals while regulatory hurdles increase the cost of new drugs. Anatabloc is the first and most "unbelievable" nutraceutical yet but I see other scientifically valid natural products coming.

One nutraceutical I'm very excited about is nicotinomide riboside or Vitamin NR, a superior form of niacin developed by Cornell and Duke Universities and licensed by ChromaDex (CDXC.OB). NR has profound implications for mitochondrial function, cholesterol, fat loss and nerve health. It appears to me that it would work synergistically with anatabine citrate, Anatabloc. Hopefully, we will have data within the year.

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