



## The *Franklin Sanders'* MONEY CHANGER

### Dr. Reg McDaniel on Glyconutrients

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*A native Texan, Dr. Reg McDaniel graduated from the University of Texas Southwestern Medical School and has spent 30 years practicing anatomical & clinical pathology, including positions as the Director of Pathology & Laboratories and Director of Medical Education at Dallas-Ft Worth Medical Center.*

*In 1981 he began research at Fisher Institute for Medical Research using a bean extract to stimulate the immune system. In 1985, he took the work of scientists that had isolated the active principle of the aloe vera plant, and conducted the first government-monitored studies in humans using this glyconutrient, aloe polymannose (manapol®) with unprecedented results. He devoted his attention to the potential of glyconutrients and other plant micronutrients to restore health by nutritionally supporting normal biochemistry under gene control. In 1996, the American Naturopathic Medical Association recognized his work with their "Discovery of the Year Award". For nine years Dr. McDaniel was a consultant to Carrington Laboratories, and Medical Director for Mannatech, Inc. for their first eight years. Mannatech, Inc. takes micronutrient research and technology to the mass market.*

*Currently, Dr. McDaniel serves as Medical Director of MannaRelief Ministries, whose mission to get micronutrients to children whose parents cannot afford the products. ([www.mannarelieff.org](http://www.mannarelieff.org)) He has published numerous papers on glyconutritionals' effects on various disease conditions. Dr. McDaniel kindly made time for this interview on February 7, 2003.*

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MONEYCHANGER I first heard about this nutrient from a friend whose husband suffers from multiple sclerosis. He began taking it and experienced a good bit of improvement, although over the course of several years he began to worsen. My daughter has the mild form of Lupus and it helps that very much. Could you give us an overview of the science that underlies your work?

McDANIEL In 12 years of medical training I was taught virtually nothing about nutrition, that's not just a Texas medical school deficiency. Andrew Weil from the hallowed halls of Harvard estimates he had less than 30 minutes' nutritional instruction. This is a terrible vacuum. Over the last 18 years I have slowly come to realise that nutrition is the most important thing anyone in health care could study.

I didn't *start* there, though. Back in 1985 two gentlemen came to my office in the Dallas-Fort Worth Medical Center. They told me a story that immediately turned me off and started me figuring out how to get rid of them diplomatically but hurriedly. They told me that in 1984 eight AIDS patients had contacted their company, Avacare (it no longer exists). These patients all said, "My mother/grandmother's nosy next door neighbour made me drink your aloe vera beverage. I was incapacitated with the whole spectrum of AIDS, but now I'm back at work."

I thought I had learned by golly everything I ought to know in medical school, and they'd never mentioned aloe vera. The idea that a gel from a desert cactus (actually a desert *lily*) could help AIDS was absurd as far as I was concerned, and I got rid of them. But they kept coming back and finally I agreed to interview their eight patients over the phone for about 30 minutes each. Afterwards I wrote a little half-page letter. That said, yes, it sounded like they all had AIDS, like they had all drunk a certain amount of aloe vera, and after three months they were much better. It deserves being looked into, but I wouldn't spend too much time or money doing it. The likelihood of finding something effective against this lethal viral infection in anything as safe as aloe vera gel was very poor.

They wanted me to do a pilot study, and I refused. Finally they talked me into it. What I saw in that pilot study and the next three studies changed the entire course of my professional and personal life. Eighteen years later, here I am and that's all I've been doing since then.

It was incredible. The AIDS patients were human models of disease. When you wipe out the immune system, all your systems of your body begin to fall apart. We're not broken up into neat little boxes like the books teach, but all mixed up together & integrated. More than links in a chain, it's a chain on the wall going many different ways to make a pattern of life, not just from one end to the other but criss-crossing everywhere. It is the pattern of the beauty of life, with each link connecting to the other.

In these patients I saw increased instance of malignancies, autoimmune diseases, and infections because their immune system was knocked out. Not only did their AIDS improve, but also their ulcerative colitis and Krohn's disease, their lymphoma, their leukemia, their Capuche's sarcoma, *all* improved. It didn't take a rocket scientist to wonder whether a person *without* AIDS would respond to this stuff. The answer was, *yes, they did*. That's why the story continues to grow.

MONEYCHANGER What is in "this stuff"?

McDANIEL The aloe vera plant is 98.5% water and 1.5% solids. It contains approximately 200 trace ingredients, just one of which is a very special sugar that every cell in our body must have in a certain step in synthesis. Actually, we need nine molecules of it at a critical step in the endoplasmic reticulum. Three chains are added to the end of chains of amino acids, the proteins or peptides.

MONEYCHANGER The endoplasmic reticulum is inside the cell?

McDANIEL Yes, inside the cell is an assembly line that works like the Ford assembly line. If you leave off clutches or brakes off, the cars they won't run right. Likewise, if your body leaves out any element, *you* won't run right. Everybody knows about Iron Deficiency Anemia: no energy, no memory if just one part – iron – is missing from the diet. We require literally tens of thousands of parts, sugars, amino acids, fats, vitamins, and minerals.

In the aloe plant there was a sugar, mannose. Shortly after the research team at Carrington Laboratories found this out, a key paper appeared. I call it “the Rosetta Stone for the power of nutrition in biochemistry” to prevent disease and restore and maintain health. It was written by a husband-wife biochemist team named Kornfeld and published in the *Annual Review of Biochemistry*, 1985. It describes the assembly line in each of our cells, and emphasises those components that are sugars – and we're not talking about table sugar.

MONEYCHANGER When we think of sugar we usually think about sucrose, glucose, or fructose. You're talking about . . .

McDANIEL A whole family of sugars, very similar to the others, but with a different shape. The casual observer might not even notice their difference, but a molecular biologist would. And they're not *sweet* sugars.

You need nine molecules of this sugar, mannose, in that assembly line. They help carry on communication between cells, not unlike tiny IBM cards . . .

MONEYCHANGER You mean the old computer *punch* cards?

McDANIEL Exactly, except the coding is not holes punched in the card, but the order in which the sugars are hooked together. They are in three chains, and they fit into receptor sites and enzymes that carry on life in cell membranes.

Some of our cells need to stay home, like our skin, connective tissue, bone, muscle, and organs. In the domain of these three chains there are the charges and the fitting together that keeps cells at home – “cell adhesion molecules” (CAMs).

We also have cells that *don't* stay home. They wander around, particularly the white cells and red cells and microphages. Everyone has had an abscess or infected cut. Lo and behold, millions of white cells come in, the purulent material. How did they know to come there?

The three chains where the mannose attaches carries encoded information. By the order of the sugars the body alerts the white cells, “Hey, we've got a staphylococcus infection here in the arm -- come help fight it!” That's sent out through the serum and the blood, and the white cells come roaring in, because these little IBM cards called them. As a group they are called “cytokines”-- cyto- from cells, -kines from kinetic activity -- or cell activators. These are interleukins, interferons, chemikines, and tumour necrosing factor. If it's a malignant cell, they destroy it. If it's an altered cell (as in autoimmune diseases like lupus), it gets that message and so the inflammatory action attacks it. That's what causes the swelling and redness in rheumatoid arthritis and lupus.

Why did this hit me so hard? By putting the work together from the Rosetta Stone Paper with the work of Carrington Laboratories we had found out that the active ingredient in aloe was this mannose sugar. That's why human beings have been using aloe for over 5,000 years.

MONEYCHANGER Is that why the raw aloe vera gel applied straight from the plant to a burn helps? Whenever anybody at our house gets burned, we just split open an aloe vera leaf and slap it on the burn. No matter how bad the burn is, it helps.

McDANIEL It cuts the pain. A Chinese graduate student in Chicago found that pain is reduced by a substance in aloe vera that blocks the release of thromboxain from the burned cells. That attaches to tiny nerves and gives that stinging, terrible pain. Aloe's healing and anti-inflammatory properties come from a mixture of things. Mannose accelerates healing by giving the cells what they need to make the molecules for healing.

We isolated this white powder from aloe vera -- chains of mannose sugars hooked together like pearls on a necklace. But the law at that time was that if you made a claim for anything to improve health, it was a "drug" by legal definition. So we had to file a new drug application with the FDA.

Almost immediately we landed in trouble. Phase I, the first step in drug application, was toxicity studies. They want to know how much of this white powder from the aloe plant it takes to kill half the mice, and how much it takes to kill all of them. The father of pharmacology, Paracelsus, said, "All drugs are poisons. The benefit depends on the dose." All regulatory law in the developed countries starts with this toxicity phase because they know all drugs are poisonous.

Our immediate problem was that we couldn't kill anything – not mice, rats, cats, horses, emus, ostriches, fish, or undergraduates at the U. of Texas who took 4,000 milligrams a day. Finally we ran it sterile IV into medical students in Houston without any evidence of toxicity.

Obviously, it wasn't a drug, but the law said, if you're improving health, you must go through this process. So they kept sending us back to another animal species, giving more of it longer, and we still couldn't kill anything.

Our second problem with the FDA was their question, "What will your label *claim* be?" Notice there's no "s" on the end of that. We started telling them all the things that it would do – remember we were supplying a special sugar at a critical stage for all the communication and relationships of cells. That could help a lot of things. When we told the FDA that, they looked at us like we had three heads. Finally they got up and walked out of the room in October 1986 and it never progressed any further because we had hit them with a double dose of *heresy*: no toxicity, claiming health benefits, and now, instead of one claim, many. One drug, one application -- that's how the FDA is organized.

Fortunately in 1994 something very good happened: the Dietary Supplement Health and Education Act (DESHEA). The first paragraph says it was passed to decrease health care costs. Second paragraph says, "Science has shown that optimum nutrition is essential for good health and performance, to prevent disease, and to restore health." That was the most revolutionary thing that had happened in the FDA since the Pure Food and Drug Act was passed in 1906. FDA doesn't like DESHEA, I might add, and fought passage of it and still fights to repeal and neutralise it. Many refer to it as the Health Freedom Act. It allowed herbs and dietary supplements and natural substances to be marketed freely, and the FDA wanted them treated as drugs.

To the FDA's credit, many of our drugs are concentrated and modified extracts from plants. The idea that everything "natural" is safe and pure and clean and wholesome is not true. Some of the most toxic substances known are "natural" – ricin from the castor bean, botulinum toxin, *e. coli* -- so "natural" is not necessarily safe. Unfortunately herbs were thrown in with the dietary supplement act that included micronutrients and true dietary supplements. Herbs are more accurately "folk

pharmaceuticals” that have not been through the FDA approval process. Throughout history they were mostly safe because people diluted them in teas or alcohol extracts (tinctures). Now with modern techniques you can take the active ingredient from herbs and hold in a capsule the equivalent of five gallons of tea

MONEYCHANGER So the FDA was opposed to taking herbs & supplements out of the drug category?

McDANIEL Right, but under DESHEA all you needed was a reasonably pure manufacturing process, and no claims of treating or curing disease. We don't, even though people using our product enjoy better health. We give the cells of our body what they need nutritionally to control the genetic programs of life and to optimise health. We are not treating disease, we're optimising nutrition.

After the passage of DESHEA, Mannatech went over to direct marketing. By using network marketing -- people to people sharing their story --in 90 days we reached more people that we did in 10 years through the drug paradigm approach with a detail man. When you place this micronutrient technology with a doctor, it sits there silently on a shelf. But when your kid gets out of special education and off of Ritalin, when you sell your wife's wheelchair, when you throw away your walker or cane, you tell everybody you know.

MONEYCHANGER Have you seen that sort of results?

McDANIEL Oh, yes. We've got nearly a million distributors now who have told somebody else about it.

MONEYCHANGER There are people who have, for instance, multiple sclerosis, who seem to experience an amelioration of their symptoms. Is that correct?

McDANIEL Hundreds.

MONEYCHANGER Orthodox medicine does not offer those people much hope.

McDANIEL Where do these micronutrients excel? If (1) medicine and science do not know what causes the problem, if (2) there is no effective treatment, or if (3) the treatment can become worse than the disease, that is where these micronutrients excel.

What if we had never discovered Vitamin C? We would have people dying of scurvy. We would try every drug in the pharmacopeia and scurvy would still kill them.

Now suppose the *Make A Wish Foundation* had a group of dying children who had seen the movie *Flipper*. They say, “Before I die, I want to swim with Flipper.” They would take them down to the Caribbean to swim with those dolphins. While they were there they'd load these poor children dying of scurvy with lemonade and orange juice. Soon they wouldn't have scurvy any more. Then we would pull together a multi-million dollar research team from some citadel of medical research to find out why. And eventually they would discover something in citrus juice called Vitamin C complex that prevents and reverses scurvy.

The experiences of the vitamin era are now being repeated, not for vitamins but for these micronutrients. It has nothing to do with drugs – it has to do with missing components that our cells require.

When I graduated from medical school in 1962 I had never heard of attention deficit disorder or hyperactivity syndrome or AIDS or chronic hepatitis C. The words weren't even in the books. Autoimmune diseases like rheumatoid arthritis and lupus and multiple sclerosis were all rare. Now they are virtually epidemic.

These are all conditions that respond extremely well to diet. We have thousands of children now off of Ritalin and out of special education, no longer a behaviour problem, and many excelling academically.

MONEYCHANGER Did some large shift in diet occur in the past 40 years?

McDANIEL It has been going on longer than that. We have ploughed up our family gardens, chopped down our family orchards, and more and more eat pre-processed foods. I did a library search into high-pressure liquid chromatography analysis of foods. I found that this sugar in the aloe plant, we raise it by the untold tons in the country, starting in the rice paddies of Louisiana & Texas through the grain fields of Kansas and up to Canada – tons of that same sugar that is in aloe, but *it never gets to our table*. Why? When you make white rice and white enriched flour you strip it out and create an artificial deficiency of this critical micronutrient sugar. It's so important that when we added it back from the aloe plant, doctors, nurses, parents, patients started exclaiming in every direction, "It's a miracle!"

No, it's not a miracle, it's just restoring to the modern diet a vital micronutrient that every one of us needs. Is it a miracle that people no longer die of beri-beri and pellagra? No, they just needed vitamins. Today, after 41 years as a physician, I have never seen a case of scurvy, pellagra, or beri-beri. None of these conditions would respond to any drug in the pharmacopeia.

In the 1940s when I grew up, everybody had a garden and orchard in the back yard, chickens, and a cow. The more our population has become urbanised, the more homegrown food has disappeared.

MONEYCHANGER Not from our house. If nothing else, it makes a huge difference in how the food tastes.

McDANIEL You know what that taste is? Everybody knows the difference between the taste of vine-ripened tomatoes versus those picked green, shipped across the country, and held in the back of the grocery until they're red enough to fool you. Take 'em home and they're tasteless red mush. It's the same with fruit. You know something is missing. Harvard University researchers say that vine-ripened tomatoes contain over 200 plant-synthesized micronutrients. When they're missing you can taste it.

This is repeated over and over in our food chain. We started out with that one sugar that taught us the importance of nutrition and focussed on that one point in the assembly line inside the cell. After DESHEA we went back to the Rosetta Stone paper and looked at a cell final assembly line we had ignored: the *Golgi* (GOAL-jee), named for an Italian biologist. That is the final assembly line step for all the molecules in our body, incredibly complex. That same paper points out that other sugars are needed to finish off the domains on the ends of our glycoproteins and glycolipids that make up the structure function cells of our body.

We went to nature, found those sugars, and we mixed them with the one sugar that human beings have been using for 5,000 years. Everything that we had seen before now became quicker, better, and more complete in sicker, more hopeless patients, and they turned around. We were amazed. We named it Ambrotose, after the food of the Greek gods, *ambrosia*.

About 1995 the American Cancer Society announced a survey of thousands of American children. Although we know our children need five to seven servings a day of fruits and vegetables daily, the average American child gets one or two, and half of that is fast food french-fried potatoes. The article also said that because of this, our children pay a lifelong price in compromised health. One of Mannatech's founders, biochemist Bill Ferretti knew that at Johns Hopkins University they had been researching freeze-drying plant-matured fruits and vegetables. He put that together into a mixture, but his 13-year-old daughter informed him kids would never eat that because it smelled like garlic. (So it did – that's one ingredient.)

When he asked her what kids would like, she said, "Gummi Bears." So he called the Henry Heide Company that made Gummi Bears and they said they'd love to help make a children's supplement. So we made the Phyto-Bear to replace what kids will not and do not eat.

Since the 1930s we've known that when you raise crops over and over in the same soil, and put nothing back in besides commercial fertilizers with nitrogen, potash, and potassium, that the plants cannot properly make phytonutrients and the molecules we need for healthy bodies. I've had two plant physiologists tell me that our food plants in the field plants are suffering from bacteria and fungus and insect infestations comparable to what we see in humans, modern diseases like MS, kids with recurrent drug-resistant otitis media and sinusitis. The soil has used up the trace minerals and the plants themselves are sick. To correct this, you have to put minerals back into the soil.

MONEYCHANGER Might Ambrotose help diabetes or arthritis?

McDANIEL Diabetes is epidemic. Unfortunately among American Indians, Canadian aboriginals, and Hispanics in some areas *half* of the adults have diabetes. They respond to these micronutrients better than any other group. Dozens if not hundreds see their blood sugars come down, hemoglobin H1Cs move toward normal, their peripheral neuropathy (numbness) reversed, and kidney function improves. In a small study right now in St. Louis the doctor reports a 75% reversal in diabetic neuritis that was thought to be irreversible.

MONEYCHANGER So apparently it does help some diabetics?

McDANIEL A high percentage of them, particularly Type 2, but also Type 1s. If they get started soon enough after diagnosis some don't even have to take insulin anymore. What is the most likely cause of Type 1 diabetes? A virus that has a predilection for the pancreas' beta cells. If you can get started soon enough the virus is inactivated and the beta cells regenerate. But you have a window of opportunity to do that.

MONEYCHANGER How long is the window of opportunity?

McDANIEL It depends on the strength of the individual's immune system and diet. We thought the diabetic would have to start taking it a year had passed after diagnosis, but we have a little boy in California who started taking it five years later. He's had major reduction in his need for insulin, and some days he just can't take insulin. He's making too much of his own now.

MONEYCHANGER How many servings are these people taking?

McDANIEL The amount required varies incredibly. By the way I want to pay tribute to a scientist who tried to tell the world about this long ago, Roger Williams, Ph. D., biochemist at the University of Texas Austin. When you see pantothenic acid on a bottle of multivitamins, he discovered it -- made up the name, defined its role in the cell, and synthesized it. He named folic acid and did pioneering work on it. For a child grow or recover from an infection, some gene must be turned on.

Dr. Williams discovered how that happens. But nobody would listen to him. He was ostracised. He wrote over twelve books because nobody would publish his research & papers.

This pioneer in nutrition wrote what are today the most important words I can say to you. They come from his book, *Nutrition against Disease* (1971). “The theme of my life’s work and all my books is in one sentence. The human body heals itself, and nutrition provides the resources to accomplish the task.”

In that book he points out that one of the big differences between drugs and micronutrients or foods, is that the amount of nutrient required to correct a problem can vary *three thousand fold*.

MONEYCHANGER For one person a teaspoon suffices, while another needs 3,000 teaspoons?

McDANIEL Yes, and we see this regularly.

This is not something new. Everything we have developed and make available you will find uniquely present in human mother’s breast milk. We were designed for these micronutrients, and that’s why we’re seeing such a response to supplementing it.

The power of nutrition supporting our genes is going to provide an advance in health care beyond anything that has ever happened in history, only rivalled by clean water, clean food, proper disposal of sewage, and vaccinations.

[end of interview]

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*Normally I have less than zero enthusiasm for multi-level marketing, having thoroughly embarrassed myself once with A\* \*\_\* in a previous life. In the case of Mannatech, the chief product, Ambrotose, can have such astonishing and beneficial results that I willingly overlook the MLM and we even signed up. However, you don’t have to do that to use and benefit from the products. – F. Sanders*

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