

Protozoal Infection -- The Next Big Discovery?

A New Protozoa Appears Linked To Mystery Diseases

By Marc Braman, MD, MPH

Take Home:

New findings of a previously unknown protozoa in patients with conditions such as lupus, chronic fatigue, multiple sclerosis, Lou Gehrig's disease, etc may prove to be a major medical breakthrough. While there are still some pieces of the puzzle to be proven, there are many pieces that fit so far. Treatment may prove very challenging, but lifestyle and diet has a surprisingly profound effect on the organism and patients.

Part I

The following is Part I of the transcript of a recent interview with Steven Fry, MD. Some parts are somewhat technical. We have tried to provide brief definitions or explanations throughout.

Analysis and explanation will follow Part II.

Please do not expect your physician or other health care provider to know about what is covered here. You will not even find most of this information on Dr. Fry's lab's website. Understand that it will be some time before some of the remaining studies that test "causation" are completed and this information is more widely known and used.

Interview

Braman: What I'd like to do by way of outline is: If you can just share a little bit about how you came to get into this rather unique field, what you are currently doing, what you are finding from the testing that you are doing, and what you are seeing in terms of patient outcomes -- just kind of an overview. And then in part two I'd like to move into what you are seeing and finding relative to the lifestyle effect on these conditions and the lab findings that you are doing -- so kind of a part 1 and a part 2.

Fry: Okay. So, I first got into this area -- well, let me backtrack a little bit and give you my background. I have a bachelors degree in Microbiology, a masters degree in Molecular Biology, then I went to medical school, then I did a transition internship, then I did two years of surgical pathology, and ended up in general practice. And while I was in general practice, I got intrigued by those patients who were perfectly healthy, and then would go on a trip, or something would happen, and they would develop a flu-like illness, and they would develop what we now call chronic fatigue syndrome.

Then the real breakthrough was about seventeen or eighteen years ago when I had one of my patients who had fibromyalgia, which is very similar to chronic fatigue syndrome -- in many ways I feel like they are the same disease, or the same disease entity. She gave me a book written by Henry Scammell, I think the title was 'Why Arthritis', [probably actually "The Arthritis Breakthrough" by Henry Scammell with Thomas McPherson Brown, MD] it was on the best sellers list in the early 90's. It talked about Thomas McPherson Brown, the rheumatologist, who was one of the chief rheumatologists at Washington University. He was using antibiotics -- primarily tetracyclines -- to treat autoimmune disease. So she brought me this book, and I was a little hesitant, but I read the book and I was really impressed by it, and I said, "What's the harm here putting her on minocycline? I mean I put teenagers on minocycline for acne." So you know, the risk benefit ratio was huge in that sense. And I started her on minocycline, and she got amazingly better on a course minocycline. Her fibro got better, her lupus got better, and so I started to pursue that, and with more and more patients I started to use tetracyclines for therapy.

And then finally I started -- you know, there was a network of physicians who worked with Dr. Brown's former technique, and I got on, I guess, a group that was referring patients through that -- I was one of the few in the southwest doing it. And I started getting patients with lupus, and rheumatoid arthritis, and one thing led to another, and I would start doing patients with MS [multiple sclerosis].

And then about eleven years ago I was impressed by an article out of Italy on chronic fatigue syndrome, and I just borrowed money, bought a nice research grade microscope, and started developing some stains. And in about six months I developed a stain that was picking up bacteria attached to red blood cells. I thought it was bacteria at the time, turns out it was. And then we started to see ring shapes that looked very similar to malaria, but it really wasn't malaria. Anyway, one thing led to another, and it turns out that what we were looking at was actually a variety of different bacteria attached to red blood cells. Now the old coin name would be bartonella, or hemobartonella, and it turns out on a molecular level it was a lot of different kinds of bacteria. And the intracellular bacteria, or intraerythrocytic [inside red blood cells] bacteria that we were looking at really wasn't bacteria, it was this protozoan [single-celled organisms that include amoebas and the malaria organism] that we've discovered. And at first I thought it was babesiosis, and over the years, and a lot of money, and a lot of time, turns out it was actually a malaria-like organism with an extremely complex lifecycle that forms biofilm communities in the blood, it is a blood-loving parasite. And after mapping the genome of it, and we didn't really name it until we had done that -- it's probably a new genus, in the phylum [???]. You know, similar to malaria, similar to babesiosis, even more complex genetically, sort of in between a helminth [parasitic worm] and a protozoan.

So it's really a complex organism. And because of the biofilm, and its slower rate of growth, it's really not that invasive, it's not like staph, or strep, or malaria. And it hides itself from the immune system, and hides itself from antibiotics, and likes to attach to the surfaces.

And over the years I evolved from using simple antibiotics like tetracyclines to more complex formulations that were really geared more towards malaria-like, or protozoa-like organisms. And that seemed to work a little bit better.

And then a year and a half ago I was introduced to Colin Campbell's work, John McDougall's work, and I said, "You know, these patients that they claim are getting much better on a low-fat diet, a whole foods plant based diet, well these are the same patients I'm treating." So we started to look at that analytical level and saying, "Hey, does this organism that we're working on basically have a fat requirement?" Well it does. We were able to grow it in a culture, give it fat, and it grows a lot better with fat than without. Actually it doesn't grow very well at all without any fat. And then we followed patients who went on a low fat diet, and we were able to calculate that the levels of this organism were decreased, sometimes disappearing, on a whole food, plant based, low fat diet. So, in the last year, my practice, I would have to say it is a lot more successful because I've combined this dietary lifestyle approach with traditional antibiotics. And that's where I am today. Does that make sense?

Braman: So over what period of time -- what was it, eleven years -- that this has occurred?

Fry: Actually, you'd have to say that it's been about 20 years. About 20 years ago I got interested in fatigue syndrome. Now let me explain something, as I saw these patients and talked to them and got their histories, you know, trying to really dig in to the real core of this whole problem, a lot of these patients with autoimmune disease start with fatigue syndrome. Most people don't realize it, and other neurologists will acknowledge that, actually I was at a CCSVI [chronic cerebrospinal venous insufficiency] training session, at the neuroimaging center in Buffalo, and we were lectured by one of the leading MS experts -- he's there, and he agrees, a lot of these MS patients have a prodrome [preceding syndrome] of fatigue, and it is really fatigue syndrome. So I feel that, you know, there is this spectrum of disease, starting with fatigue, that leads to fatigue, joint pain, muscle pain, brain fog, myalgic encephalitis. Then these people go on to develop a really true, full blown arthritis, or lupus,

or, ALS [amyotrophic lateral sclerosis – Lou Gehrig’s disease], Parkinson’s, that sort of thing. So the mechanism of the disease is primarily for the neurodegenerative disorders, is a vascular sludging, and most probably vegetations that we can actually see in ultrasounds in these patients, and that is some work that we are very interested in, and we’re probably going to start a collaborative study with one of the centers on that one.

Braman: So with what kind of ultrasound, what kind of vegetations are you finding?

Fry: Well, they are doing -- this goes back to Paulo Zamboni’s work. I think he’s a vascular specialist at the University of Ferrara in Italy. His wife came down with multiple sclerosis and he wanted to find out what it was and hypothesized it was a vascular problem, and then after a lot of work developed an ultrasound technique and was able to visualize, using ultrasound, a defect in flow in either the deep cerebral veins or the petrosal veins of the brain or the internal jugular veins coming down from the brain. The next step to that was that he was able to show that in patients who had internal jugular vein obstruction or decreased flow he could go in with a balloon catheter and open this up. Some of these MS patients could get improvements and some dramatic improvements in their condition. Of course there’s a relapse rate with this that is actually quite high.

But it makes sense if it’s a microorganism that is growing there and you’re kind of, you know, clearing things up -- that would make a lot of sense. So now this has been repeated by Dr. Hubbard, who’s just recently submitted a 265 patient study showing similar results. Actually, that was a 6-month study. So these patients with MS have obstruction in the flow of the brain, and Dr. Hubbard used the word “swamp”. There’s reduced flow, bad flow, backflow. We feel the same way, that the brain is probably a sensitive organ or tissue. So if you change the flow environment in any way, whether it is less oxygenation, less nutrients, you are going to see some subtle changes and thus demyelination. It would be a subtle change, and I want you to know that they have documented remyelination in some of these patients where they have done this balloon procedure.

So here is a model of MS. In MS the researcher Roy Swank showed that patients with MS who are on a low fat diet, basically did not die of MS, and if they were on a regular diet they died of MS. And I think John McDougall was associated with the study, also out of University of Oregon, a five year study which should be near completion. I don’t know if he’s going to talk about it at ACAM meetings this week. I’m going to make sure I see that lecture, and I’m just curious to see if that data has been completed and if it shows the same thing that Roy was able to show. So if you tie in that concept with our concept it makes a lot of sense.

Now another interesting point, if we want to talk about MS and neurodegenerative disease, is that MS, there are about 75 papers dating back to the 1880’s where physicians and laboratorians have discovered a malaria-like organism in patients with MS. There are 75 papers. There is a review article, a medical hypothesis, a two-part article that discusses this, and actually used antimalarial drugs in the 1920’s and early 1930’s in MS patients with significant improvement. But there was so much malaria in the U.S. at that time that they concluded that they really probably just had underlying malaria, and that was the cause of their MS. So if you put all the dots together it is a very fascinating argument if you believe that, in effect, this agent could be the underlying cause.

Braman: Wow! Now when you were talking about vegetations and ultrasound, can you actually see vegetations on the ultrasound image?

Fry: Yes, and when you see these vegetations, some are valves, and actually they categorize the type of vegetations. Or actually, they don’t use the word vegetations as Zamboni does, and I use that vegetation concept or idea. But there are growths, or filaments, or webs, or other structures that they see, that certainly aren’t normally found in the vasculature. And if you look at Zamboni’s work -- there is one you can see online -- Paolo Zamboni, you can pull it up, and there is an ultrasound and you can see the valve moving, but also you see a lot of other smaller and filamentous type material. Actually we have seen in blood samples filamentous material similar to that in patients with chronic

fatigue. I think it is the same thing, and what we are seeing in the blood are really material that has just detached from the vasculature in long linear strands.

Braman: And has there been any work using -- you mentioned using a balloon to help clear things up -- what about things like thrombolytics ["clot-busting" or dissolving medications]?

Fry: Well, you know, thrombolytics are used in therapy on patients with proven vascular obstruction with clot. Now if you want to think of lumbrokinase as a thrombolytic -- you know, a lot of the alternative medicine folks out there are using lumbrokinase, serrapeptidase, and other agents like that to whittle away at these diseases. And of course you know Dave Berg who advocates a lot of this thinking, that it's really...I think Dave's old way of thinking about it is, some agents, whether it's infection or say a heavy metal like mercury or something like that was, whether it was a virus or bacterial agent -- chlamydia or whatever -- was stimulating this coagulation phenomena producing a coagulation disorder. And of course he's got the ISAC panel that he used to use to determine what type of coagulopathy these patients had and whether or not they had a hereditary disposition.

Now if you throw in this concept that these patients might have gross obstructive disease with a biofilm-forming protozoan, then it's sort of...kind of brings all this thought together. So really in these patients they have -- for instance, in the CSF of fibro patients, they have brain fog -- I think that's due primarily to sluggish flow either through some obstructive process due to these vegetations that I'm talking about, or even just the viscosity issue with a larger microorganism forming biofilm communities in the circulatory system.

To really mainstream [medicine] this is a radical concept, but the idea of biofilm communities elsewhere is no longer a radical concept. But I think a hematopoietic biofilm community of protozoans is a radical concept. But -- you know -- we have pictures. And, you know, the pictures are pretty astounding, pretty amazing. I developed this hypothesis years ago, that this is a biofilm problem, modified for additional techniques, and... there was, right in front of us. It was always there. And again, I'm not the first to report it either.

Braman: And so the biofilm -- they're a web, or fibers, or sludgy blood?

Fry: Well, actually, not quite. Basically a biofilm...when we think of biofilm, bacterial biofilms... in training back in the '70s when I went to undergraduate school we called it "the slime layer." And microbiologists have known about slime layers and syncytial microbes for a long, long time. And the best analogy would be to think of a slug that you see crawling around, and you know that slimy stuff on there, it's a similar material. It's a mixed mucopolysaccharide, there is hyaluronic acid in it. And actually the biofilm is a very complex structure with a lot of function attached to it. And so DNA is the -- I think the "rebar" for biofilm. DNA is not only an informational molecule, it is also a structural molecule. So with this rebar of DNA, that's basically a grid system. Secreted are mucopolysaccharides, peptides, that sort of thing. So it is able through the biofilm -- it can actively transport nutrients in and export noxious byproducts from metabolism out.

The only problem is that it also excludes antibiotics and drugs. Also biofilms prevent the microorganism from being even seen by the immune system, and we think that is what's going on with these patients. So if you have ever heard of the Jarisch-Herxheimer [clinical worsening due to the infectious agent dying off] reaction, we think what is going on in a Jarisch-Herxheimer in these patients.... I mean usually when you treat these patients with drugs, say a lupus patient with Plaquenil, they feel terrible initially and it flares up their disease. So what's going on in that particular situation, I believe, is that the drug is getting to the organism somewhat and weakens it enough so that its antigens are exposed on the surface, and system can see this enough to produce a profound inflammatory response. And I think that is what the Jarisch-Herxheimer actually is.

It's not necessarily cellular death; it's really the cytokines produced by the immune system trying to destroy the pathogen, but it can't really get at it very well. And a real limitation to therapy is this

Jarisch-Herxheimer reaction or inflammatory response. And, possibly, if we found the greatest drug in the world to kill this microorganism, the use of this drug would be limited because of this profound inflammatory response once you start to get at that organism.

Braman: How are you currently treating this and what results are you seeing?

Fry: Well I'm actually pretty conservative, I'm really kind of the McPherson Brown... you know, go slow, steady, conservative approach. Let's not get people so debilitated they can't go back to work. Almost all of these patients are low in Vitamin D. So the first thing I start patients on is Vitamin D. Some patients start Vitamin D -- they get ill when they start, then they start feeling better. So, in terms of nutrition, vitamin D. And then I put them on a low-fat diet. And the amazing thing -- the majority of my patients who initiate an ultra low-fat diet have a Herxheimer reaction. So we can actually explain that now because we've weakened the microorganism. It probably needs fat because of this high energy requirement to produce this biofilm in a harsh host environment, and as we restrict fats it weakens the organism, the immune system can see it, and we get a flare.

A lot of my patients have a flare reaction, or Herxheimer reaction, when they change their diet to a low-fat diet. And then I start with tetracyclines -- usually doxycycline or minocycline. I like those two because it hits a lot of other microorganisms at the same time. They're pretty safe, they're inexpensive, and both drugs are also antimalarial drugs. They're used prophylactically and for application for treatment around the world for malaria. So they actually have antiprotozoal activity that most people aren't aware of.

Then I proceed to azithromycin because that seems to work in some patients. It's a safe drug. You can take it for long periods of time without major problems. And then on to more of the traditional antimalarial drugs like Plaquenil in combination with tetracyclines -- that's been done for a long, long time. I think the hesitancy in the rheumatology community for minocycline or tetracycline: 1) is they're not sure how it's working, and 2) these patients have a flare or Herxheimer reaction that's very hard to manage. And that may be one of their observations, not really understanding the underlying mechanism and what's going on there.

I thought for a long time these patients may have had babesiosis because it seemed to look like it in the microscope and I was using azithromycin and atovaquone and patients have profound Herxheimer reactions on that combination, but once they get through it they seem to actually do very well. And we're always looking at other drugs in the laboratory, and that's another story -- what drugs seem to work in the lab. I don't think our model of disease is developed enough...we use microtiter plates, we're able to culture it. I just don't think our model of disease is good enough yet to make great conclusions as to invitro [in the lab] sensitivity. I'm pretty sure that people have different strains of this microorganism. One drug might work on one person, and not on another person. So I suspect that there are really significantly different strains of this organism out in the community.

Braman: So you are able to culture this and grow this in the lab?

Fry: Oh, no, we can grow it. There is no question we are growing it. So we're growing it quite well, it's just that I'm not really happy -- there are a lot of technical issues with drug sensitivity. A lot of these drugs require second order kinetics. They have to go through the liver, so it is just a matter of time and money to really get serious about doing drug sensitivity studies. But we have some interesting data created now, and confirmed by PCR [polymerase chain reaction -- a technology for measuring very specific DNA sequences] so.... Really what we developed is a biofilm assay for this organism, I mean, that's really what we're measuring now. And those studies are really backed up by PCR, quantitative PCR.

Braman: So are you actually able to eradicate it in people, or is it an indefinite...?

Fry: We cannot eradicate it in patients, as far as we know, and we cannot eradicate it completely in the test tube yet with any known agents that could be delivered in therapeutic doses. Now we have

some patients who are feeling very well, who, where by our normal procedure, we can't find evidence of disease, but if we go through a sample and keep looking, and looking and looking we can find some. Most patients that are ill, with our technology it's very easy to detect disease. These patients that are doing much, much better, who are on a low fat diet, we're able to find it, though rarely in those patients. So I cannot say that we have eradicated it in any patients. My patients who do great, who are on a low fat diet, if they start eating a regular American diet again, they relapse. So I have not cured anybody.

Part II

Braman: So how does it compare...give me some kind of picture or sense of what percentage of people with what conditions are you finding this in, and how does that compare with normal, or people who don't have these conditions?

Fry: Well, that's an excellent question, and that is actually the purpose of the Phoenix Study. We're trying to go through IRB approval for this study, a 390 patient study. Ninety patients consisting of 30 with CFS, 30 with MS, and 30 with ALS, compared to 300 normal controls. Now we find this organism profoundly in everybody with autoimmune disease. Now you have to consider the spectrum of autoimmune disease. That includes diabetes [type 1], MS, probably ALS, autism is considered an autoimmune disease in some circles, lupus, rheumatoid arthritis, sclerodermas, sarcoidosis, chronic fatigue is acknowledged as a possible autoimmune disease, I am sure it is, and fibromyalgia. So we have a lot of people out there with chronic inflammatory disease who I think have this. I think we've got now probably 20 or 25 different categories where we are able to isolate this organism. Where we are fully convinced that this is the cause of their disease because when we are able to knock down this microorganism in their blood, their symptoms resolve, and sometime resolve dramatically. So we have a cause-and effect confirmed by microscopy and PCR in these patients. So we think that is the cause of their disease.

Now the question is, what is the incidence or prevalence of this microorganism in the community. We think it is very high. In that study we recruited 300 normal controls. Now our criteria, this is probably the most difficult part of the study, recruiting patients who are perfectly healthy with no complaints. I think the older our patient population gets it's going to be much, much more difficult to find individuals who really do not have chronic headaches, chronic fatigue, chronic joint pain, and a lot of these other symptoms. And they have to be perfectly healthy with no complaints, on no medication, and no history in the past of having any of these autoimmune diseases. So it is a really tough challenge.

So, if we believe that mosquitos are a prime vector, and we have proven mosquitos carry it, mosquitos are all over. We actually have this kind of ballpark guess, you know, in the population, we think 10 to 20 percent per decade of life is the increase or acquisition level of this micro-organism in the community. So we think a lot of normal people have it, but maybe genetically inclined to where in their immune systems handle it, maybe diet and exercise play a role, their own immune systems and their genetics play a role in this. So if it is true that this is the cause of lots of cardiovascular disease, when you talk to a cardiologist they say "Hey, the event that caused this cardiovascular disease we think happens by the time people hit the age of thirty." And if this is the same phenomena then that may be right. It may be our estimate of 10 to 20 percent per decade, is too low. Maybe it is higher. But we think it is a ubiquitous pathogen all over the world.

Braman: All over the world?

Fry: Yes.

Braman: And you said that you have pretty much proved that it is found in mosquitos, and/or transmitted by mosquitos?

Fry: I can't say transmitted. That's a whole 'nother study. I would need some animals to do that study. That requires money; animals are pretty expensive. If you want to get it published, you've got to do it the right way. I think we were going to look at four Guinea Pigs for four months; that was around \$10,000 for that little study, just for the animals from an animal resource at the nearby university. We actually did the study. We went down to an area in the Phoenix metropolitan area where a lot of people are getting chronic fatigue, I know, cause I've been taking care of patients here in the community for the last twenty years. We then caught, I think we caught about 20 or 30 mosquitoes. 81 percent of the mosquitoes, two different species of mosquitoes, were PCR positive for protomyxoa. That is the name of the organism. So mosquitoes certainly have it—now whether they are transmitting it, you know, and whether they are a vector or not, that's a whole 'nother issue. And I don't know how transmissible it is by a mosquito bite.

Braman: Is there any indication of any other source, or transmission?

Fry: We suspect, oh, I have a number of patients who really seem to get sick after what looks like water or food contamination. And then I'm convinced that ticks are certainly a vector. Two out of two ticks that we've tested were positive by PCR. We now have a nurse in upstate New York. We're going to start a one hundred tick sample study, hopefully we'll get a hundred ticks from the area of upstate New York. We're actually going to run a number of different vector borne disease assays looking for babesiosis, ehrlichiosis, anaplasmosis, rocky mountain spotted fever by PCR, and protomyxoa by PCR, and survey that population of ticks. This will all probably be from the same general area in upstate New York. So we will get a larger tick study in that one area to see if they actually carry it.

Braman: And has the, what you called protomyxoa, is that an internal name or has this been officially recognized in some standard process as a new bug?

Fry: That is a, we think it is at least a new genus. It's maybe a higher order, and we can find nothing similar to it that is close enough genetically, so actually that is the name we developed. It was a scientific name we developed or came up with. Protomyxoa is Greek for "slime forming protozoan". And we call it protomyxoa rheumatica because we think it is associated with the autoimmune or rheumatic disorders. We have not submitted our DNA database, or our DNA map to the international registry for IP [intellectual property] reasons. We are a private diagnostic laboratory; this is our technology, and we just haven't done that yet. We are protecting our trade secrets and technology. Eventually this will get out; that's our plan, that's our intention. We plan to partner with one of the major institutions for validation. It just takes time and money.

Braman: So how far away do you think you are from this hitting mainstream knowledge and use?

Fry: Well, one of the problems is publications. We have a very small publication. We presented this information at the 2009 Biofilm Meetings. And we had no problem getting our abstract accepted. We've submitted this article really in fuller form to four mainstream peer-review neurology journals—this is a study in ALS; that is one of our main interests. And they have declined to review it, or they've rejected it. And one of my colleagues is the former editor of one of these journals, the former president of one of the national societies, he says, "Look, this is too political, too new, really a radical concept." And actually the CCVI information showing obstructions in MS patients is now considered a very radical concept. So it is just going to take time, and we realize that. So now we are looking at lesser journals, reconstructing that small paper to get that out. And of course, larger studies we have on the books, we are trying to get IRB [institutional review board – a system for ensuring the ethical guidelines are followed in medical research] approval for a number of studies right now. And that takes time and money. But we just keep plugging away at it. We are almost done, we are using one of the larger IRB's, institutional IRB's available for groups like ours. And we have a consultant with them, and we are designing a study, and it is pretty much, it's almost done, it has some rough edges to clean up. Then we've got to pursue additional funding to make that project happen. But that is in collaboration with two neurologists in the Phoenix metropolitan area.

Braman: So you are getting some uptake in the traditional system?

Fry: Sure, yeah, and I have some of my colleagues that are patient, they're open-minded. And, you know, when you show someone one these pictures, that we get from some of these patients, it's really pretty amazing. It's hard to believe it's there, it is hard to believe these patients are alive with that kind of infection. But if you understand the underlying disease process, you can understand why they are still alive with a disease like this. They are not well, they don't feel very good, but, you know, they are able to stay alive. And we believe this is chronic inflammatory disease.

Braman: So have you sequenced the DNA of this organism yet?

Fry: Actually we've mapped the genome and filed an IP on that, but we've mapped the genome, yes. And that is how we know where we can place it phylogenetically, and know it is new, and know it is unique.

Braman: Interesting. So if you have gotten to the step of actually sequencing the whole genome, you know you are dealing with an actual bug. Not just in pictures, as impressive as that might be. But if you have the DNA in hand, and it is consistent, and it is mapped, then you know you have a "critter", if you will....

Fry: Right, and so really the gold standard in microbiology today is the molecular signature, well, we have that now. And not only do we just have a signature for a portion of the genome, we have the entire genome mapped. At least, an isolate from one patient. And with that information we know it is unique, it's not like anything else. Actually it is probably close to a couple other organisms, but not close enough to say that it's probably in the same order, same phylum, but not the same order. And really, this type of organism we think is a little different than what we are used to dealing with genetically. And it is just a unique organism. It's a slime forming complex protozoan, trying to become a helminth [parasitic worm], trying to become a worm. And that may suggest why it is really resistant to a variety of different medications. It's a tough bug. It has a lot of gene sequences that are very, very similar to human. And that is probably the confounding aspect to it. Because it has resiliency of human tissue, and it has similar requirements. And this is probably an organism that developed over the eons and borrowed genes from its hosts. And, you know, kept some that it liked, and discarded some it didn't like. And of course it's got its own genetic information, and it's, you know, it's progenitor with some ameba, or some protozoan in the past. But it is a little more complex than say, malaria or babesiosis genetically. Actually it is sort of in-between, again, a helminth and a malarial type organism.

Braman: And has this been.... you mentioned you have found it in mosquitos and ticks. Do we have any reason to think that this may be in people's dogs and cats, or cattle and chickens, in this country?

Fry: Actually, we did a study on one of my employees, the spouse works in a veterinary lab, and we were able to get random samples. And, dogs have it. And actually, the older the dog is the greater likelihood of having this organism. Younger dogs don't have it, the older dogs have it. And so we think the same thing we will find in humans. Younger humans don't have it, older humans do. So, that was a small study, about eight or nine dogs, one cat. Actually, we looked at one cat, one cat did not have it, the cat was two years old. But the dogs, the older dogs had it, the younger dogs didn't.

Braman: Interesting. Now if this.... If everything "pans out" if you will, and gets out there, this would be a phenomenal impact on health and healthcare.

Fry: We think so.

Braman: What do you see in the future for this, and I mean, how do you think this is going to impact healthcare.

Fry: Well, for most patients, most of the healthcare dollar is spent on taking care of chronic inflammatory disease. Diabetes, cardiovascular disease, the autoimmune diseases, you know—we think the mechanism is again, slugging or clotting. So for instance, in the type-two diabetic, you might like my model of why a low fat diet works. And I've seen it in my practice. So patients with type two diabetes, non-insulin dependent diabetes, if you put them on a low fat diet, their diabetes gets better, and sometimes they can go off their medication completely. So our model of this disease is that vascular slugging, and deposition of plaque occurs, and I said the word plaque, and this is what biofilm communities do, they form sludge, or plaque, or growths. And this is producing slugging and clogging up the small vasculature and capillaries leading into these, into the islet cells [cells in the pancreas that produce insulin]. So if you sort of clean.... You know, the islet cells aren't dead. If you clean things up, if you restore flow, then you get endocrine function again, and you get insulin production again. And I think that is the phenomenon that we are seeing in these patients who go on an ultra low-fat diet.

Now in the type-one diabetic, I think what they do—you know, if you talk to type-one diabetics, and I've actually seen this in my practice, usually they have this flu-like prodrome before they go into crisis, and they develop insulin dependent diabetes. I think those individuals probably get this organism, and it basically strokes out their islet cells, and they lose insulin functioning, insulin capability, completely. And so if we look at this, maybe we can vaccinate people against this organism, and then we may be able to eradicate diabetes, we may be able to eradicate cardiovascular disease, we may be able to get rid of autoimmune disease. That would extend the natural lifespan for many, many years in humans. So that is the implication of this, we think. And we get surprised all the time with new information.

So here we have a ubiquitous micro-organism that seems to accumulate as time goes on, and it really wasn't a problem when life expectancy was probably in the 40's and 50's, which wasn't too long ago. But now, as we have older populations that are in their 60's, 70's, and 80's, they are dying of heart attacks, they are dying of strokes, they are dying really of autoimmune disease. And so now this organism becomes a much bigger factor as the population ages. And it becomes really more important, so... I mean earlier humans were dying of infectious diseases primarily, now humans are dying from other diseases, and we think this organism could be the underlying cause.

So it has a lot of implications for healthcare. For example, what if we started treating autoimmune disease patients more aggressively with anti-malarial drugs and diet. If you could really make the rheumatologists and the neurologists believe that, hey, this is the cause.... So listen to what Roy Swank [MS research who showed that a plant-based low-fat diet was of large benefit to many MS patients] says, lets put everybody on a low fat diet, lets emphasize that, why don't we try them on a course of minocycline or doxycycline. You know, minocycline is already in the literature worldwide for treating MS, ok, this is not something new. What if we got a little more aggressive with some of the chloroquines, the problem again with practitioners who have tried this in the past, I'm sure, is this Jarisch-Herxheimer reaction.

Braman: So on a scale of potential impact this could be huge. I mean this could be one of the biggest medical breakthroughs in what, the last century...?

Fry: Well, it's possible, but only time will tell. We are very convinced this organism exists, we are very convinced that we can alter its disease course. Again, when we show a dramatic reduction in this by PCR and by visualization in the blood stream, we see clinical improvement in patients, sometimes dramatic. So here we have an organism cause-and-effect with intervention, and if we're right, then a lot of people have this disease, and, you know, we really just call it "chronic inflammatory disease". We don't really know what the underlying cause is. Well this could be a new cause. So it has wide implications.

It is just a matter of time, and work, and money to get these publications out and these studies done. And then to win over our critical colleagues to get this published. I mean here, you know, the fellows

who review papers and all this—you know, it's a club. And when you come up with a radical concept, they have to protect their turf and their journals, and their way of thinking about things.

I remember talking to Barry Marshall before he got his Nobel Prize years ago, and he went through a lot of flak from saying that *H. pylori* [bacteria] was the cause of ulcers. Not a radical concept, but in those days it was. And when I was introduced to Barry's work in what was it, '80 or '81, I think that he was kind of frustrated, but people started to listen to him. So any new concepts are difficult. The thing is, if you put it in perspective, and you put all this information together—I mean physicians, writers, and researchers have been saying this for over 100 years—you know, this is not a new idea. This has been out there a long time.

Braman: They have been saying what for one hundred years?

Fry: Well, you know, at least in the case of MS, writers have been saying that it was a malaria-type organism for over one hundred years. So, I'm not the first one to say that a process like this is going on.

Braman: Right...

Fry: Yeah, it is just that we have done a lot more in developing techniques to basically get a high yield on anybody that has this organism to say they have it. And that is the main focus of our laboratory, coming up with more tests to define the organism for clinical diagnostics and clinical therapeutic purposes.

Braman: I remember—I don't know if I mentioned it to you before—but there was one point where I was seeing as a patient a nurse who used to run research projects for a major medical university. And she became ill. She saw all the specialists. Nobody could help her. So she started looking, and eventually figured out some fairly alternative stuff that made it so she could function. So when she came to see me, we ran a bunch of tests, and again, I had been looking at a lot of other stuff for years trying to help people, and dig beyond just the typical. And I found a lot of evidence for chronic infectious agents, and/or coagulation issues. And I still remember—I used to process the specimens myself, I would draw it, I would process it, I would separate it, etc.—I was stunned that this lady's test came back negative for the things we were testing. But what really stunned me was that after I spun her blood and went to separate it, it was stringy. I mean it was literally, visibly stringy.

Fry: Yeah, and that stringy stuff is not clot, it's protomyxzoa in filaments. We've seen it, too. And we've actually taken that stringy stuff from blood and looked at it under a microscope, done a PCR analysis, and that's actually a linear biofilm community, filamentous, of protomyxzoa. There are actually other organisms embedded in there, but it is primarily protomyxzoa. So what you are seeing is this organism.

I have to tell you, I was talking to a patient in the summer. He wasn't my patient, someone else's CFS patient, a real sick fellow. And he said "Yeah, when they draw my blood all these stringy things come out. The nurse just said it was a clot." And I said, "No, that's probably this micro-organism, that filaments are there." So you can imagine that in the vasculature, you know, getting in the way, producing chronic inflammation, reducing flow, and that can make you pretty sick, tired and exhausted.

Braman: Is there anything else that you think would be helpful for people to understand about what you are doing? Clinical pearls, perspective...?

Fry: Well, one of the things that I find very detrimental overall, and this is very controversial in the alternative community, is that a lot of practitioners are prescribing mineral supplements. Magnesium, ok, and it seems to make people better for a little while. But magnesium is a major component of biofilm, so we feel and observe that when patients are taking magnesium supplements

I can never get them any better with antibiotics or any sort of therapy, and when I take them off their supplements eventually they seem to start getting better. And so magnesium as a supplement to these ill patients dramatically enhances the biofilm forming capability, and basically you are building armor around this micro-organism. So in the short term, when you give magnesium to these biofilm communities you hide them even more from the immune system, so you get a relief that is less inflammation. But in the long term you are building up slugging, more biofilm, and enriching that community, which makes it harder and harder to get rid of. So again, this is very controversial, I get a lot of criticism for this. But I think in the long-haul I'm going to be proven correct in this analysis—that the supplements really aren't good for people. And I don't know if this is a pearl or not, but that is just one observation.

Braman: Oh, absolutely.

Fry: Yeah, I observe that clinically, and then becoming a biofilm educated microbiologist, I sort of put it together, and now there are actually a couple of studies that confirm this in biofilms, exactly that. So what the magnesium does is it stabilizes the DNA and actually becomes an integral portion of it. There is a biochemistry behind it.

Braman: Very interesting. Any other pearls or insights?

Fry: No, just need more time and more money (laughs) for our studies and eventually we will get there. Right now, we'll primarily support it by revenue coming in from our laboratory running these tests, and we've had a few very generous individuals that have helped out somewhat. We just got a small grant actually from the Coulter Foundation. And they are watching us now, and hopefully that will grow a little bit. But again, we have to produce some data, and of course we have to go through IRB approval to generate data on large numbers of patients. We are working on that and hopefully we can stay ahead of the game and keep the funding and the project going. And I think we will.

I think there is enough interest now in the community to where doctors have been sold on this idea, they are very curious, they want to order these tests on the patient, and we can show them photographs and DNA data that show they, indeed, have an infectious agent. And the question is the frustration with therapy. It's very difficult to treat, and it is hard for most practitioners to convince their patients to change their diet. So that is a big stumbling block. So I think eventually that diet is helpful, but we are going to have to come up with a drug that works where people won't have to diet. And then a method, of course—the linchpin is a method of reducing their inflammation during therapy. And this is the hardest thing to get patients to go through. Some patients start to flare, and then they say, "That's it, I'm done. I don't want any part of this." So, it's an obstacle.

Braman: So how do you spell protomyxzoa?

Fry: Ok, so it's p-r-o-t-o-m-y-x-z-o-a, protomyxzoa. And that's Greek. And that's our name. We filed that with the patent office in connection with the gene sequence. And we are probably going to file that within the next 12 months in the international databases. We could be wrong; I don't think we are. It's just I've got some very good people working with me. We have three different technologies now, with actually a fourth one coming online soon, that say this is what it is and it makes a whole lot of sense. And if you go back and pore through the literature there is a lot of supporting research done on what we are saying. And now we have this macroscopic evidence that's pretty amazing, and that puts the puzzle together. And again, the traditional techniques for looking at blood, traditional molecular techniques for analyzing blood, don't work. This is the big struggle over the last decade. And getting this technology together it was not obvious.

Braman: And why don't the traditional techniques work?

Fry: That is intellectual property.

Braman: Oh, ok.

Fry: That's the trick. There are a number of tricks, and it took a long time to figure out the tricks. We can reliably now detect this organism in people that have it. We're very convinced of that. And we are actually coming up with better ways. The real problem is going to be, if you are getting a patient a lot better and can't find it through the techniques we develop, do they still have disease, when can you stop therapy? And that is our goal right now in therapeutic diagnostics, that's where we are going with this. But the diet is huge, lifestyle modification, diet, exercise, get in the hot tub, get in the steam room, get rid of all the sugar, you know, the high fructose corn syrup, get rid of the fatty diets. And some of these patients have dramatic improvements with lifestyle changes. I have people who don't want to take antibiotics. They change their lifestyle, they do get better. So you folks are on the right track.

Braman: And you said steam rooms and saunas. Are you finding those helpful?

Fry: Yeah well, you know, the ancient Romans, the American Indians, the Swedes had this figured out a long time ago. This disease has been around forever, and you know, it is like my handyman who is in his late 60's says: "Well, why do you do the hot tub everyday?" cause it makes me feel a whole lot better, okay. So I think that this organism probably has an intolerance for heat. And we know that when we heat the body up we get vasodilation, that probably improves blood-flow, and also it probably has an effect on the immune system. It probably blunts some of the inflammation. So that is another adjunct that I recommend my patients do one of those modalities, and it seems to help.

Braman: Excellent.

Fry: Again, that's lifestyle modification.

Braman: Absolutely. Hey, I want to thank you so much for taking the time to do this.

Fry: No problem.

Braman: I'm excited about this. I think it's fabulous, and I think it's the kind of thing we need to do in looking at things from multi-modal perspectives, and putting the pieces together.

Fry: You know I've tried to stay open minded here and tried to fit this all into a model, and it seems to fit.