

Antibiotic alternatives for Doctors and Their Patients

Interview between **Bill Bodri** and **John Seleen** of JHS Naturals on Mushrooms

Bill: Why is there this big focus on mushrooms all of a sudden? What's the general reason people are starting to use mushrooms for health?

John: Primarily for the benefits to the immune system. All the mushrooms contain compounds called beta glucans or polysaccharides that help restore balance to the immune system.

Bill: Are there any other ingredients besides the beta glucans?

John: There are several types of beta glucan and each promotes different helpful responses to conditions like hepatitis, cancer, asthma and chronic fatigue. One particular mushroom, *Coriolus Versicolor*, has been the focus of over 400 studies in China and Japan. It's been approved by the Japanese Health Ministry for cancer use and so its cost is covered by insurance. It's the most widely used product in the country for people facing immune problems and because it's so successful, the cost to the Japanese health care system reached almost a **Billion** dollars a year. That's when the Health Ministry restricted the use of it to those people most in need, receiving chemotherapy and radiation for cancer treatment because it doubles and even triples survival rates.

Bill: What are the studies showing? Are people doing research in the US, outside of China and Japan, are there any clinical studies on going on?

John: In a way the rest of the world is trying to catch up with China and Japan. There's clinical research going on in Europe. There's a study going on at Sloan Kettering right now on Maitake. Our company is working with the University of Pittsburgh Cancer Institute. We're presenting a funding proposal to NIH to look at *Coriolus* for breast cancer ... so it's just starting.

Research on mushrooms has been going on in Asia for 30 years. As to intensive animal studies and clinical studies ... really in the last maybe three to four years have mushrooms really gotten any recognition outside of Asia and has there been any sort of interest expressed in doing research on them.

Bill: A lot of people don't understand that over in Asia, for instance in China and Japan, they have been using mushrooms for hundreds and hundreds of years. They are a key part of their pharmacopoeia.

John: There's references to the use of Reishi that are almost 2,000 years old in China.

Bill: I actually have copies of some of those books. My question, however, is whether the clinical trials and medical studies of today are confirming the same uses for the mushrooms that were mentioned and recommended thousands of years ago?

John: Some of the diseases, like cancer, are much more prevalent today than there were then, but a lot of the therapeutics uses -- when they are mentioned in the Chinese *Materia Medica* -- have been validated with Western research.

Let's take *Cordyceps*, which is used primarily for lung and kidney conditions. It's been found to be very effective against asthma. *Cordyceps* has been used as a sort of rejuvenator. A lot of older patients use it not only to restore immune competency but to rejuvenate the system overall.

With *Cordyceps* in particular and with Reishi, they found that the clinical studies validate all the uses mentioned.

Bill: Before we go into all the different major types of mushrooms – I know there are four or five *major* types – you can turn almost any mushroom into a supplement ... I think the major question people have is... what type of supplement if they are going to go that way should they look for?

In other words, let's pretend you are a consumer advocate. Please walk us through it. What should people be looking for when they are buying a mushroom supplement so that they are not wasting their money? I would think someone out there can grow a mushroom or pick it from their backyard, dry it and grind it up and put it into a capsule and sell it but that's not necessarily going to give people any of these immune benefits you're talking about

John: All the research has been done on what they call a "hot water extract." In literally 100% of the references built from modern clinical research and from traditional herbal use, they *all* have these mushrooms being prepared as a hot water extract. The reason for that is that the active compounds are found inside the cell walls and the cell walls are made of an indigestible fiber called "chitin." The human body cannot break chitin down.

Bill: We can't digest it. It's just like wood pulp. Our bodies don't have the enzymes to break it down.

John: Exactly. We can't digest it. The active compounds in a mushroom as a percentage of the dry weight is a very small amount. That's why they do extracts (1) to create a bio-available supplement and (2) to concentrate the active compounds to levels that are therapeutically useful.

Bill: So you're saying that the mushroom itself has a cell and the woody pulp isn't really useful to us medicalwise, but that it's the stuff inside those woody cells that matters?

John: Exactly. The active compounds might be 1-2% of the mass by dry weight, and you would need to eat pounds of mushrooms to get a therapeutic dose so what they do is called a "decoction," which is basically a hot water extract. They remove the indigestible portion. In essence they melt it away.

The chitin is the same material a lobster shell is made out of. It's more bonelike than plant and the hot water melts the chitin away leaving the cell wall constituents in their whole form and then they have to be left in their original shape because the bio-activity of the beta glucans is based on the shape of the molecule.

For a consumer to go find that on the shelf, they would go look for a product that identifies itself as a "hot water extract." Really, the key is to look for a product or company that's willing to tell you *what the levels of active compounds are as percentage*.

The mushroom products that are not extracted do not list the potency. The names are quite confusing ... there's "mycelium bio-mass" and "fruit body powder" and "hydro-alcohol extracts" ... none of which I would recommend, but you don't even have to know that.

If you just look at the label and to the supplement facts panel -- which is by law required to be on all these supplements -- and if they do not list the level of beta glucans or polysaccharides as a percentage, then you know you probably do not want to buy that product.

Bill: There you go! That's the key people want to know. But besides the hot water extracts, I see a lot of mushrooms that are extracted with alcohol tinctures or with solvents. Can you comment a little on those?

John: Let me back up a little bit. A "hot water extract" can be a confusing term.

A hot water extract is dehydrated into a powder. Even though it has been hot water extracted, we pull the water out much like pulling the water out of a frozen orange juice concentrate where they pull the water out and leave the solids. Then we use a spray drying machine – a machine that was developed to make powdered milk—and then we spray that concentrate into a powder and at that

point we can encapsulate it. It's a much easier way to provide the product as opposed to a liquid that needs to be preserved. When you pull water out, the product is dehydrated and will keep for years with no problems.

As to the hydro-alcohol extracts ... the extracts that are persevered with alcohol typically are not very potent. That's why you will never find those products listing the potency on their label.

Bill: That's nice to know. That explains it.

John: Really, it gets back to looking at the label. If a company will not tell you the potency as a percentage then you probably don't want it. The hydro-alcohol extracts are also called "cold process tinctures." It's a great process for plants because the plants are made from cellulose and the alcohol can break the cellulose down and you've got a decent product there. The active compounds will leach out into the solution.

With mushrooms you absolutely *must* have heat, typically at least 160 degrees Fahrenheit for a minimum of 4 hours to break the cell walls down and release the active ingredients. The alcohol extracts on the market in the US are not heat extracted. Another tell tale sign are that the polysaccharides or beta glucans come out of solution at about 28% alcohol, which means that for most of these products that are preserved at 35% alcohol ... if there's no sediment in the bottle then there's very few or very low levels of the active compounds.

Bill: In terms of the polysaccharide itself -- the active ingredient -- I suppose you don't want to damage it as much as possible when you're releasing it. Are there various hot water ways to release it so that there's minimal damage versus maximum damage to the process?

John: Every mushroom has its own best temperature to release the active ingredients inside the cell walls. It's a balancing act. You want to use as much heat as you can because it speeds the process up, but you don't want to use so much heat that you damage the product.

Reishi is typically extracted around 160 degree Fahrenheit, Coriolus at 190, Maitake can be boiled, Shiitake can be boiled although usually it's not.

When I say that the beta glucan bio-activity is based on shape, what they have are these long macromolecules with what's call "branching side chains." They have *spikes* that stick out from the main body of the molecule at a right angle. These branching side chains interact with receptors on the surface of the immune cell, like a lock and key relationship, and that's how they stimulate an immune response.

If you extract them at too high a temperature you break the bonds, the side chains fall off, and you no longer have a bio-active product, which is why you really want to go with a company that has an established reputation and is willing to tell you what is in the bottle.

Bill: Are there any other consumer tips other than just check the bottle to see if it lists the percentage of active ingredients.

John: Yeah as regards tips to consumers, other than the Maitake fractions I would avoid liquid products unless they're willing to tell you what's in the bottle. Just in general, if a company in the supplement facts panel isn't telling you what the potency is as a percentage -- and it's always a percentage of the dry weight ... it's either 20% or 25% beta glucans -- if they're not telling you what the percentage of active compounds are by dry weight *you probably don't want to buy the product.*

You don't have to be a scientist to look at the label to see if they're giving you that information.

Bill: That's a really great tip. Why is Maitake the one which does not follow that rule?

John: With Maitake fractions they are able to isolate very small pieces of the overall molecule that seem to have the same benefit as the molecule as a whole so that they can actually deliver a lower level of those actives in a liquid format and still deliver what's considered to be a therapeutic dose.

A "fraction" is just another name for an isolate, just like it's used in grade school where a small slice of the pie can do the work of the whole pie. You take just a little slice and that little bit of material, as presented in liquid, will work.

Personally I prefer a whole extract because you're still getting your fractions. They just haven't been pulled out and I think some of the things they leave behind are also quite valuable. Personally I think a "Maitake full spectrum extract" is going to do a better job than the fractions. But in terms of liquid products, the Maitake fractions *do deliver* a therapeutic dose in a liquid format and in my opinion are probably the *only* liquid mushroom products capable of doing so.

Bill: What you are saying makes perfect sense that it's more desirable to take a full spectrum product. It was the same story for vitamin E ... first they found this one particular vitamin E fraction that they tried to isolate, then another one, and now they have eight different fractions. All along the way they kept saying you should use this fraction or the other one for this reason or that, but actually you should use them all in combination. There's no sense to distill off a single fraction or take an artificial vitamin E that isn't full spectrum. It just doesn't make sense, just as you are saying for mushrooms.

The same story was repeated for the herb St. **John's** Wort where for years they standardized concentrations to one of the constituent components, or fractions, and only recently discovered that an entirely different fraction was doing the work that they expected of the herb. Herbalism is full of stories like that and certainly so is TCM (Chinese herbal medicine) wherein everything is based on using *full spectrum extracts*. In general, that's what people should take.

John: One other thing about hot water extracts. They are properly referred to as "guaranteed potency extracts." These are not standardized. Nothing is being left behind. We are just pulling out the indigestible portion that you can't use anyway and then you have more room left in the capsule for the stuff that's doing the work. You can then dramatically reduce the number of capsules people need to take.

Bill: Can you standardize mushrooms for the active ingredients though?

John: I just don't think it's a very good approach for mushrooms. We just guarantee the potency of those actives that we know are doing the work and leave everything else in there except for the indigestible part.

Bill: The clinical studies, research, and customer feedback on their experiences of usage all together show they produce results.

John: Right. The research is based on specified levels of the active compounds, but 99% of the research has been done on what we would call a "full spectrum extract" where they're simply quantifying and using a consistent level of the primary actives.

Even in the research they're not using isolates. They're pulling out the indigestible portion with the hot water extraction. Once you've broken the actives out, you're able to then guarantee the levels to create a consistent level of the active compounds. It's also very important because you need to take a consistent dose over time.

Any doctor, whether it's from Western medicine or Chinese medicine, will always recommend a consistent dose ... sort of a consistent intervention. There's really no way to know (1) when you're

getting enough and (2) whether you're getting a consistent dose over time unless you have a guaranteed potency extract.

Bill: I know many of the Chinese doctors will have people buy particular mushrooms and keep boiling them and drinking that, in effect making their own tea. Is that an effective way to deliver the active ingredients or is that an ineffective technique?

John: A lot of people don't have time for that, but you can make your own tea. Some you want to boil, some you want to bring to a boil and then steep ... let it simmer for awhile. The one drawback is time. Number two, with a guaranteed potency extract you *know* you're getting enough.

When you make a tea, not every mushroom has the same amount of active compounds. That's why when we make our hot water extracts we start with a ratio -- let's say twenty to one (20:1) -- but then we test partway through the extraction process to make sure the active compounds are at the level we want. They're not always at those levels, so we simply add mushrooms until we bring the levels of active up to where we want them to be and then move through with the extraction.

Now, guaranteed potency extracts allow you to guarantee your daily dose. Mushrooms are dose dependent like everything else. For serious conditions, I would think a person would want the convenience and the certainty of a guaranteed potency extract. For just tonic purposes and general health purposes the teas are fine. You certainly can estimate what you are getting out of it. You certainly can't guarantee it.

Bill: Before we get into the types of mushrooms themselves, it makes sense to talk about that factor ... whether you want to use mushrooms as a tonic, preventative or as a cure. I hope you can talk a little bit about that. Many people worry that if you use mushrooms everyday that it's like Echinacea where you can burn out or over-stimulate your system.

John: We haven't found that with mushrooms. They are immune stimulators. They're more properly classified as "adaptagens". They can quiet down an overactive immune system or increase the vigor of a depressed immune situation.

Bill: Do most people use them for prevention or for cure?

John: They're used both ways.

Reishi is probably the premier tonic herb in Chinese medicine used daily as a preventative. Used for years it's classified in the highest class of tonics along with Cordyceps and some of the other tonic mushrooms. In the clinical studies, they find the mushrooms are giving the same boost to the immune system in the sixth year as they are in the sixth week! There's no tailing off of an effect.

Bill: Really? Interesting! Is that just for Reishi or for all of them?

John: That's for all of them and what they've found is really a hard concept to grasp but the mushrooms *only work if your body needs them to work*. They're adaptagens. They are not strictly stimulators.

Typically in the US—because we're dealing with cancer, hepatitis or chronic fatigue – we find a suppressed immune condition and we want to enhance the immune function and that's what the mushrooms will do. So our most common use is to use them as immune stimulators but technically they're defined as "immune modulators" and they can be used over long periods of time without any negative side effects. They do not "burn" the immune system out the way Echinacea does. They just work differently.

Bill: Do you have to cycle them when you take them, or can you add them all together and take them all at the same time when you take them? Many doctors I know would try to put them into cycling protocols.

John: There's different theories. When they have tried single extracts over long periods of time they have found that they still work.

Mushrooms work. There's beta-1,3, beta-1,4, and beta-1,6. That defines the shape of the molecule. That simply describes where the branching side chains originate. You have six carbon atoms that make a ring. Thousands of these rings link together to make this long tubular molecule. The branching side chains will always originate from one of the carbon atoms, so beta-1,3 is simply the side chains originating from the first and third carbon atom and that describes the shape of the molecule. Beta-1,4 ... you have branching side chains originating from the first and fourth carbon molecule. Imagine the hands of a clock sticking out in different directions ... that's all they're talking about.

Some people think the best approach is the full spectrum approach – to put *all known beta glucan configurations into one pill*, which is what we've done with one product (Immune Builder) and that's a valid approach.

Other conditions like hepatitis, you would just simply use Reishi and Coriolus.

Asthma ... you would just use Cordyceps alone.

So each of the mushrooms have their own best use as a single extract. Sometimes if you're going strictly for immune stimulation it does make sense to use *two or three different kinds* so that you get all the different configurations at once.

Bill: Let's go into the mushrooms now. There's Reishi, Cordyceps, Coriolus, Maitake, Shiitake ... What typically are those groups used for?

John: Reishi is finding a lot of use by people with Hepatitis C. On the therapeutic side it's very, very good for Hepatitis C with a class of compounds called "triterpenes" that no other mushrooms have. The triterpenes are very, very good at promoting good liver function. It helps a good liver work that much better. It helps a damaged liver function in spite of the damage and allows it to function more easily.

Bill: I've heard of people using Reishi for lowering cholesterol, too.

John: Exactly. It lowers cholesterol. Cholesterol is produced in the liver and if that is the source of your cholesterol problem it will help. We've had people lower their cholesterol by 30-40% after just 4 months of use, so it is an option. Typically it works best in those people high cholesterol who have not found any other way to affect it. The real tough cases are where Reishi works real good.

In terms of non-therapeutic use, Reishi is probably the #1 sort of immune tonic. As a preventative, Reishi is the best, in my opinion, to take on a daily basis. Healthy people who want to take supplements to stay healthy and help their body face the challenges of living in our toxic world in the 21st century. The Reishi helps the body detox, it helps the liver cycle through toxins and certainly there's plenty of those out there.

Bill: The big group which really seems to see a big turn around are the Hepatitis C people.

John: If I had to recommend one extract and one only it would be Reishi although Coriolus and Reishi together are producing really *solid benefits* for people with Hepatitis C and that's a condition where there's not a lot of good options.

Bill: Do they see the results after a few months?

John: The one thing about mushrooms is that they do take a little bit of time to start working. Typically people will see their numbers -- their enzyme profiles and the various tests that they do for their liver -- they'll see improvement in about 6 weeks and they'll continue to see improvements for up to a 4-6 month period, at which point they'll probably hit their maximum benefit. But then you need to keep taking the Reishi to maintain that improved status.

Bill: What about Cordyceps?

John: The number one therapeutic use for Cordyceps is asthma. Again, it takes 4-6 weeks to kick in, but we are finding most people who take it are able to get off their inhalers ...

Bill: ... even kids?

John: We typically don't recommend it for kids who are under 6 years old, but Cordyceps are very, very good for asthma. It supports both the lungs and the kidneys. The kidneys are very much involved ... you have to address the kidneys as well as the lungs when you are trying to positively influence asthma.

Bill: I was always told Cordyceps was good for athletes and stamina. Of all things, I also heard it's sometimes good for ringing of the ears.

John: It does clear up tinnitus (ringing of the ears) in some people. There are four or five reasons why people get ringing of the ears. One of them responds to Cordyceps. Since there are no side effects, typically people are willing to invest in a bottle or two to see if they have that one tinnitus that responds.

Also we sell as much of the Cordyceps now to athletes as we do to doctors. Cordyceps increases stamina and increases endurance. Most distance athletes are using Cordyceps. Cordyceps increases the number of red blood cells, which increases the oxygen carrying capacity of the blood. Therefore your heart doesn't have to work as hard to deliver a set amount of oxygen. Also, Cordyceps can increase blood flow to the heart and Cordyceps will replenish the adrenals, which are intimately involved in that sort of adrenaline pumping athletic competition ... the fight or flight response.

Bill: Sounds like a big balancing mushroom.

John: Yes, it does restore the adrenals. Cordyceps is working on a number of different levels to positively influence the physiology of the athlete.

Bill: What about Coriolus? That's the big cancer mushroom.

John: Yes, Coriolus is primarily used for cancer used as mentioned primarily after surgical treatment to help prevent recurrence. The clinical studies that were done as part of the drug approval process in Japan ... they looked at Coriolus being used as an adjuvant along with chemotherapy, along with radiation but also alone. As mentioned, there's clinical studies where it has basically doubled or tripled survival rates. In the lung cancer study stage 3, when they added Coriolus to the protocol it had twice the survival rate as stage 1 without the Coriolus.

Bill: Wow! How does someone who has chemotherapy add Coriolus to their protocol?

John: It comes in pill form. Mushrooms should be taken *twice a day -- morning and evening on an empty stomach* -- and beyond just restoring it, typically the immune system is dramatically suppressed by the use of chemotherapy. They found that Coriolus can dramatically restore the white blood cells, which is the cellular immune system.

Coriolus can restore white blood cells to their normal levels in 12-14 days. Typically they would expect ... for a depressed immune system ... that those white blood cells would remain at a very low level for weeks, if not months.

Bill: That's a pretty dramatic turnaround.

John: It is. It pretty much ... a lot of the oncologists who approve of one patient using it see those results and they then give it to another patient and continue to see the same results. They're a skeptical bunch but they see the numbers. It's empirical. It's data that's repeated time after time. The mushroom sells itself.

Bill: It sounds like the alkyglycerols found in shark liver oil. When you give alkyglycerols to cancer patients who've had chemotherapy, they restore platelet counts to normal in just a few short days. They produce a dramatically significant boost in platelet levels which oncologists always worry about when they're looking at blood work. It freaks the doctors out because they never such great responses like that with the pharmaceutical drugs and it leaves them totally bewildered that a natural product can do this and no one told them about it, but that's our health care system.

So now we have a way to restore not only platelet levels to normal but white blood cell (WBC) levels to normal too, and within days. Hopefully the oncologists out there will try this because it's something I've always recommended. I've seen it happen several times, so I know it works. These natural supplements are not pharmaceuticals so these results are not as well publicized as they should be, but that's what we're here for. That's what this book is about.

John: Beyond just the white blood cell count and the immune status, people with cancer report Coriolus increases energy levels, increases appetite ... just positive effects.

Bill: Does it help them *stomach* the chemotherapy?

John: Not always. Chemotherapy will disrupt digestion. You're talking about the absorption of nutrient and supplements. If people are experiencing nauseousness from chemo, what will happen is that chemotherapy will interrupt the natural balance of microflora in the gut and that microflora is essential to facilitating absorption of nutrients in the digestive process.

A lot of doctors -- and we recommend it as well -- we recommend you take probiotics in an effort to reestablish the natural balance of microflora and continue the probiotics for at least a week or two after chemotherapy so you can absorb your food *and* your supplements better.

Bill: I know that taking the Sea Cure brand hydrolyzed fish protein does an awful lot for getting rid of the nausea of chemotherapy -- sometimes eliminating it completely -- as does taking some sort of green powder at the same time since the dried green juices are more absorbable. The patient has an easier time getting their nutrition if they take green powders in this situation.

Let's get to Maitake. I know it's been used for hormonal cancers for a long, long time.

John: Some people feel that Maitake is better for prostate and breast cancer whereas Coriolus seems to be better for lung, stomach, colon and liver cancer. That's anecdotal reports. Certainly the Coriolus has been proven to be very effective for lung, colon and stomach and breast cancers based on the numbers from the clinical studies. To this point Maitake does not have any controlled clinical studies on effectiveness.

Bill: I was under the impression that many companies have been selling Maitake for years. I remember years ago that Maitake d-fractions and Maitake Gold were big sellers for cancer patients.

John: Well there's a lot of companies selling it that put a lot of money into marketing it, but there are no clinical studies although the anecdotal feedback is favorable. There is a study going on at Sloan Kettering right now, but some people prefer Maitake just based on what they've read.

Bill: I remember there was a popular product called "Maitake Gold" that was very expensive and very popular.

John: It's still popular. We sell that product. We're one of the few companies that are licensed to sell that product, Maitake Gold. That's the one liquid mushroom product that we feel is valid. We wanted to have one solid liquid immune product for those people who are having difficulties swallowing capsules.

Bill: Those are the four big mushrooms. Is there a fifth?

John: Well, Shiitake is always mentioned but pretty much anything Shiitake does ... other mushrooms do better. It was the first sort of medicinal mushroom. It was very popular as a food, but is not as popular any more. You don't see that many Shiitake products on the market anyway. It was the first mushroom and then was pretty much replaced by Reishi, Maitake, Coriolus, and Cordyceps which seem to work much better.

Bill: So the big groups of people with health conditions who really seem to see dramatic differences or turnarounds are ...

John: Cancer patients, especially if they're doing chemotherapy.

Bill: They would see the big turnaround with the Coriolus mushroom, right?

John: Yes, it's the number one ... it's 25% of the Japanese national expenditure for the chemical treatment of cancer. It sells hundreds of millions of dollars a year worth outside the US. For whatever reason, US doctors just aren't that receptive.

Bill: For asthma patients, you're saying Cordyceps can turn things around?

John: Basically you're talking Hepatitis, cancer, asthma *and* chronic fatigue. People respond very well to Reishi and Cordyceps together for chronic fatigue.

Those are probably the primary therapeutic uses.

Bill: It sounds like mushrooms are not to be used for acute conditions, but for chronic conditions because they take some time to kick in.

John: It takes a few weeks for mushrooms to kick in. For an acute condition – something that comes on quickly like a flu or cold – if you take mushrooms then by the time they're starting to do any good you've gotten over the flu anyway.

They are very, very good as a preventive, as an immune tonic. Say you have children who are bringing home bugs all year round and you're tired of getting the cold or the flu in the winter season. If you start when you're healthy and you're taking these mushrooms -- whether it's a blend or Reishi or Maitake -- you are going to see the benefit. You are not going to get nearly as many, if any at all, colds and flus.

Once you've got an acute condition, it's basically too late for mushrooms. They are more often used for chronic conditions ... those health problems that develop slowly over time.

Bill: We've mentioned the Maitake Gold and the individual mushrooms. What about products like MGN3 and AHCC and your own product Immune Builder? I'm sure people would like to know the true, behind the scenes story of these products.

John: MGN3 and AHCC are made from rice bran. They really don't have any active compounds from medicinal mushrooms in them. If you're taking MGN3 or AHCC you're not really getting your mushrooms.

They have a compound called arabinoxylane that is an immune stimulator that works through interacting with receptors in the gut. Arabinoxylane is derived from rice bran and was sold for years on the dietary supplement market under the brand name "Bio Bran." They use mushroom enzymes to further break down the rice bran so that they create more arabinoxylane, but the little bit of enzymes from the mushrooms that are in there are not enough to deliver any appreciable amount of active compounds from mushrooms.

Bill: Which means that if people think they're getting a mushroom compound they're actually getting a bran compound, and the mushrooms are only used to help process it.

John: Yes, the mushrooms have beta glucans. Beta glucans pass through the gut and into the blood stream. In the bloodstream they'll interact with receptors on the immune cells. That's the mechanism by which they stimulate an immune response.

MGN3 and AHCC interact with receptors in the gut, so they are two entirely different pathways. In a essence they're complementary. They are not redundant.

Unfortunately, some people take MGN3 and AHCC and think they're getting their mushrooms when really they have that option still open to them. Certainly anyone dealing with a chronic disease is going to want to utilize as many tools as they possibly can.

Bill: What's the difference between MGN3 and AHCC?

John: They are both made from rice bran. They were both developed by the same person, Dr. Ghoneum. MGN3 only uses Shiitake enzymes. AHCC supposedly uses the enzymes from 3 different mushrooms -- **Coriolus/Kawaratake**, Suehirotake, and Shiitake -- although the patent only mentions two mushrooms ... Suehirotake and Shiitake. The difference, I guess, is that AHCC uses 3 mushrooms to provide the enzymes to break the bran down whereas MGN3 uses only one mushroom enzyme to break the bran down.

Bill: So whereas a lot of people I know thought they were buying mushrooms, the mushrooms were just being used in the manufacturing process but aren't really the major component of the final product.

John: There are no actives in the product ... no mushroom derived active compounds.

Bill: Well then the only combo product out there with a number of active compounds would be your own product, Immune Builder. What's in that?

John: It's a unique blend. It has Agaricus Blazei, which is a new mushroom that is loaded with beta glucan and is becoming quite popular. It has the Shiitake in it. It has all the other ones that we've mentioned. It has the Maitake Gold -- the Maitake portion -- Coriolus, Reishi, Cordyceps. It's basically a six mushroom combination and it does have all the known beta glucan configurations for those people who would prefer the full spectrum approach.

Bill: What's the feedback on that ... what are people coming back and telling you about that product?

John: We get a lot of good feedback. That's our number one selling product. It's caught up with the Coriolus. I don't really ask the doctors how it works. They tell me it works good and they keep on buying the products. It has become a very big seller.

Bill: Is it a general immune stimulant or do they use that for the asthma?

John: It's used as an immune tonic ... as a preventative. Two capsules a day dose provides the prophylactic dose of Maitake gold, plus there's all the other extracts in there.

Also it's used for cancer. What they'll do typically is, depending on the kind of cancer, they'll have their patients using one single extract in a fairly high dose along with the Immune Builder.

For the stomach or colon cancer they're taking the Coriolus along with the Immune Builder. For prostate and breast cancer they'll typically use the Maitake gold along with the Immune Builder. It's kind of a "covering your bases" approach.

Bill: You've mentioned beta glucans. I know a lot of people are confused on beta glucans because there's companies like Immunodyne, etc. that just sell beta glucans. Beta glucans are also found in mushrooms. Are there different ways to produce it?

John: The beta glucans that are sold as pure beta glucans are taken from the cell walls of yeast. That's a pure beta glucan whereas the beta glucans from mushrooms are hooked together with peptides or proteins, so it's not a pure beta glucan. It's called a polysaccharide or proteoglycan, which refers to the protein and the sugar together.

In Asia, there are five different anti-cancer drugs extracted from mushrooms, none from yeast. The feeling is that the presence of the protein or the peptides adds "kick" to the beta glucans and they are much better for serious conditions.

Bill: Have people been doing any studies on just the beta glucans ... because there are lots of companies just selling beta glucans?

John: Yes, they have ... at least in Asia. And I think it's significant that with all the research done on beta glucans in Asia they've never made it into the arena of cancer treatment in those countries. Mushroom beta glucans have. Yeast beta glucans have not. There are five different anti-cancer drugs extracted from the mushrooms.

Bill: That would tend to suggest, without proving anything, that if you want to go for an immune stimulating property then go for the mushrooms rather than just buying the beta glucans. However, I have heard of good results with beta glucans themselves.

John: For serious conditions, it's somewhat paradoxical but it takes *more* mushroom beta glucans to cross that threshold for effect, but once you have effect, it's a much more powerful immune response than what you're going to get from the yeast derived beta glucans.

Bill: So the yeast beta glucans can also provoke a response, but its going to take more with the mushrooms, but the mushroom results are more long lasting.

John: Right, one thing that I've heard with the yeast beta glucans is they do tail off over time. The body just stops responding whereas mushroom beta glucans -- they've studied them for five to eight years and they're having the same kick in the sixth year as in the sixth week, so there's no tailing off of the immune benefit.

Bill: I'm trying to figure out a way for people to determine if they should be spending their money on yeast beta glucans or mushrooms. I want them to save money and get results, or I should say, get

the results they need or want in the most cost effective way possible. It's useless to try to save money in a life-or-death situation.

John: Chemically they are different. You'll get beta glucan ... beta glucan ... beta glucan for yeast whereas for mushrooms you'll get beta glucan ... peptide ... beta glucan ... peptide ... beta glucan ... peptide and these long macromolecules.

Also you'll find there's the 1,3 and the 1,6 from the yeast derived. From mushrooms you'll have multiple branching. In the Maitake you'll have 1,3 and 1,6 so the branching sidechains have branching sidechains. There's 1,4 and 1,3 and 1,6 in Coriolus. So you have configurations that are unavailable from the yeast derived, and also on a basic chemical level they're different with the addition of the proteins and peptides.

Bill: It makes sense that if you don't know which one is going to provoke a reaction, just take a combination of them.

John: Coriolus has all three ... 1,4 and 1,3 and 1,6. Typically people will take the Coriolus and another mushroom that's strong on the 1,3 like Reishi or Maitake.

Bill: So that's how they do it. You can look at it logically from the chemistry point of view or you can look at it from which mushroom is already producing a good response such as choosing Reishi for Hepatitis C.

John: What happens is that the marketing departments get a little bit carried away. Some company, like Maitake, will just sell one type and another company, like Atlas World USA will just sell Agaricus Blazei, which is 1,6. Each one of them will tell you their form of beta glucan is the best thing since sliced bread. In reality a person has no way of knowing ahead of time, just going into it, which form of beta glucan they will respond to the best.

Bill: ... Or which one will be the right thing for them.

John: Exactly. If it were me, I would take the Coriolus since it has all three along with something that's high on the 1,3 (because Coriolus is low on the 1,3 side chain). I would take something like Coriolus and Reishi or Reishi and Maitake together. Maybe take a three extract combination to get the full range.

Bill: Now that we've found that all about mushrooms, we're done to our last practical concern, which are the protocols to follow when you're taking them and what to expect timewise for them to kick in. What should people do? How should they take these? What's a typical protocol?

John: Whatever dose you decide on, whether it's for preventative or to stay healthy purposes or for therapeutic purposes, you always want to take mushrooms twice a day, twelve hours apart.

That's because of the half life of the polysaccharides in the bloodstream. You want to maintain a steady level, so you go morning-evening. You always want to take mushroom supplements on an empty stomach or if you're making the tea, drink that on an empty stomach.

Bill: Why's that?

John: It's for better absorbability. If you're taking it with meals it may lock onto fat and other different things that pass out of the body. It just might get lost in the mix. Typically all herbs are typically recommended to be taken on an empty stomach and that's a half hour before meals or two hours after a meal.

Bill: So you would recommend sometime in the morning and sometime in the evening.

John: Yes, you try to get them 9-10 hours of separation. Certainly twelve hours of separation between dosing would be perfect. It's not that critical ... you just want to do morning and evening.

Bill: If someone has Hepatitis or cancer, you're saying you don't want them to take it 3 times a day?

John: There's really *no added benefit* to taking it more than twice a day.

Bill: Is there benefit to take *more* at those times?

John: The dose depends on the use. Certainly if somebody is using the Immune Builder product as an immune tonic, they can just take 2 capsules a day: one in the morning and one in the evening. Once you've crossed the line into a therapeutic situation where there's a problem that you need to fix, then of course the dose goes up.

Typically for a therapeutic dose, regardless of what mushroom it is, you're going to want to take at least 2,000-4,000 milligrams a day.

Each mushroom definitely has its own best dose but you want at least 2,000 ... between 2,000 and 4,000 milligrams per day. That's crossing over into the therapeutic range.

Bill: Let's take a look at asthma. What's a typical protocol?

John: For the asthma sufferer, a typical protocol would be 2,400 mg of a Cordyceps extract that is guaranteed at 15% polysaccharides, 6% on the cordycepic acid and .15% on the adenosine. On our product you would take 3 capsules in the morning and 3 in the evening.

For Hepatitis you want to go high: you want to go five in the morning on Reishi and five in the evening for a total of 4,000 mg a day of the Reishi. That's 2,000 milligrams in the morning and 2,000 in the evening for Reishi with Hepatitis.

For the Coriolus for chemo therapy, you want to go three plus three. Three capsules in the morning and three in the evening. Our Coriolus is 625 milligrams so that ends up being 3,700 milligrams a day. You really need to get at least 2,000 milligrams in a person to sort of cross over to that therapeutic realm.

Bill: If people don't take that 2,000, is it that they won't see a therapeutic response or it will just take longer?

John: You want to get 2,000 milligrams in you. You won't get the maximum benefit without it. Certainly in a situation where you just had a tumor removed, you basically want to throw the book at it. You want to do everything you possibly can to influence the outcome in a favorable way and the most you're talking about, even if we're talking about a high dose, is \$4 or \$5 per day. People spend that at lunch on Macdonald's.

People don't seem to place a high importance on their life. Because these mushrooms aren't covered by insurance but are paid for as out of pocket expenses, a person with cancer can easily spend \$300 or \$400 per month on supplements. It seems like a lot, but what's your life worth?

Bill: It's trivial compared to the cost of chemotherapy.

John: Of course chemo is covered by insurance. Chemo is more expensive than it should be anyway. You'll notice that oncologists are the only doctors in America that are allowed to sell their own drugs. Everybody else sends you to the drug store. Oncologists buy their product, mark it up 5,000% and resell it to their patients. That's why everyone who walks in through the door is given chemotherapy whether the numbers support it or not.

Bill: The last one is Cordyceps. What's the dosage for ringing of the ears or ...

John: Again you want to have 2,000 milligrams for any therapeutic use. Whether for tinnitus or asthma or even for an athlete because you want to seriously influence your body. You want six capsules a day -- three plus three on the Cordyceps.

As to the Maitake Gold, the dosing is determined by weight. What they recommend is between half a milligram and a milligram of the purified actives *per kilogram* of body weight. We have a little dose calculator, a one page sheet that we drop in their package so they can find their weight and determine how much to take.

Bill: That makes sense. People are spending a lot of money on this and want it to last as long as possible, but they need to be sure they're getting past the threshold so they get the effect. Otherwise it's almost a waste. I've seen too many situations where people try to act smart but end up stupid. They buy a product and then cheat on the minimum dosage to "stretch it" and then they don't get any effect and complain. People will do all sorts of things thinking they're being smart, but actually self-sabotage themselves.

Anything else, any other issue we haven't talked about or that you feel people really need to know about mushrooms in general?

John: The main thing I'd like to say is buyer beware.

Most of the products on the market in the US are just the ground up mushrooms or the ground up mycelium. The mycelium is the part of the mushrooms that lives year round. It's a network of thread-like structures, sort like a spider web almost, growing through the soil or through a tree and then in the Fall they pop up the mushroom. The mushroom is really like the apple on the tree and the mycelium is like the tree and roots of the tree combined. It's the permanent aspect of the organism.

You'll find supplements made from mycelium grown on grain. You'll find supplements made from ground up mushrooms. It's all fairly complicated. I would just again tell people to look at the supplement facts panel, to look at the label. That's a very quick and inexpensive test to determine what the potency of a product is.

You can test a batch, which is just 5,000-6,000 bottles, for about \$100 so there's simply no reason not to have the numbers listed. The test cost might add about half a cent to the cost per bottle. Certainly everyone out there would willingly pay another half penny to know what's in the bottle.

So if the company is not willing to tell you what the potency of the product is, and you're going to want to see the word "polysaccharide" or "beta glucan" and you're gonna want to see what the percentage is and it should be listed on the supplement facts panel. If people don't see that information on the label, I would suggest they move to another product.

Bill: What about when they see the words "fruit body"?

John: "Fruit body" means mushroom. It's synonymous with mushroom.

Bill: It means nothing then.

John: It means nothing. Either way you need to have an extract.

There's some mushrooms like Reishi where you really have to have the mushroom as the raw material for the extract because that hard red surface contains valuable compounds and that physical feature -- that hard red feature -- is not found in the mycelium. So for some of these species you *want to* have a mushroom extract versus a mycelium extract. If you're just going for

the polysaccharides only, the mycelium is okay. But for Maitake and actually Reishi both, for whatever reason, *and* Agaricus Blazei, you want an extract made from the mushroom, not the mycelium.

Bill: Anything you want to say about how your company makes extracts versus others out there?

John: There's other companies doing a good job out there. In terms of just speaking about our own products, all our mushrooms are grown on wood the way nature intended. We don't grow mycelium on grain. We don't make products out of that material because we feel the mushrooms prefer wood for a reason because they're converting some of the complex lignins and other compounds into the actives and giving them health benefits that we know them for. So we grow all our mushrooms on wood. They're all chemical and pesticide free. They are all guaranteed potency extracts. We test every batch. We have our own labs. We control the process from the very first to the very last step.

There are some other companies ... they are smaller companies like us that are doing a great job and putting out good extracts and telling people what's in the bottle. Unfortunately the larger companies don't.

In terms of mycelium bio-mass, which is the mycelium grown on grain, it costs about 2 pennies to put that product in a bottle. It costs more to put the label on the bottle than it does to put the product in the bottle! It costs us dollars and dollars to put an extract in the bottle. So there's a lot of companies making a lot of money out there.

Bill: That's what we're finding when we interview people. The bigger the company, the more hanky panky goes on in order for it to make more money. *They* are the ones destroying the supplements industry whereas the little guys are the innovators. It's not the other way around. The little guys are often the entrepreneurial firms with a mission bent on service who create these things and offer them to sick people. The bigger firms are out to make money and typically are greedy in some form. Not always, of course, but often enough to make you wonder. The bigger the firms get, the more they're in it to make money rather than help people. Helping people usually has a lower profit margin.

John: It's really just buyer beware out there. But I tell you they have to tell you the truth on the label. A sales rep will tell you a lot of stuff, not all of it necessarily true, but they are required by law to tell the truth on the label. If a consumer learns how to read the label, look at the supplement facts panel, and what they are telling you ...

They should tell you, number one if it's a hot water extract, because if it is they'll tell you. Number two, they should tell you what's in the bottle. Is it a 10% polysaccharide? Is it a 20%? If you don't see that information, I wouldn't purchase it.

Our goal, our philosophy as a company is that if there's an active compound that's essential to delivering the health benefit that it's known for, if technology affords you the tools to test for those active compounds and to know what those levels are, then a company has a moral obligation to put that information on the label. It's just the way we feel about it.

Especially when they're using mushrooms for very serious disease situations! They *have* to know what's in the bottle to know that they are getting enough to get effective use out of the product.

If consumers start choosing those products that are of guaranteed potency, hopefully the market will respond and other companies will start coming out with the right stuff.

Bill: If people want to learn more where do they go?

John: They can go to our website, JHS Naturals www.jhsnp.com. Dr. Mark Stengler, who has written a book on Maitake and some other good selling books on health, is coming out with a book that tells the truth in essence. It's more of a consumer guide.

All the popular books on mushrooms skip over that issue. Nobody really wants to step on anybody's toes, or else the people writing the books are the people selling the lousy products so they don't really tell you how to choose a good product off the shelf.

We decided that very people are going to go walking through the woods finding mushrooms on their own. Most people will find these in the supplemental form on the shelves of their local health food store. So the book should be out soon and will teach people how to navigate through the jungle and how to pick a good product off the shelf and how to read a label. We are coming out with a book that will through all the different mushrooms briefly, talk about their health benefits but more importantly teach people how to pick a decent product.

Bill: That's important because I have lots of mushroom guides and that information is missing in all of them. That's what I'm trying to do here and with the other people I'm interviewing for other antibiotic, antiviral and antifungal approaches is pull up the covers off and reveal what's true out there so consumers know and can get the stuff that works. Their lives are at stake and the health books don't dare approach these topics to give the meat. Certainly scientists and researchers need to know the right products to use for running double blind tests and doctors need to know which ones to use to help patients. This is not about money, it's all about saving lives.

John: To me it's stunning in that every available reference from every culture and every time period all state that mushrooms *must be extracted with hot water*. The American Herbal Pharmacopoeia just came out with a compendium, a monograph on Reishi where the world's top experts from both the herbal and the medical field stated the same thing. At least for Reishi ... which makes it true for all mushrooms ... you absolutely, positively must have a hot water extract.

Bill: And yet what you find are ground up mushrooms or alcohol solvent extracts out there.

John: You will find very reputable companies who have a lot of good products but when it comes to the mushrooms they just fall flat on their face. They're out there selling ... I mean you can eat *buckets of this stuff* and it's just not going to work.

Bill: People are wasting their money.

John: You can take an alcohol extract and you're going to get drunk off the alcohol before you get any therapeutic dose. They have a bottle that's supposed to last you a month and in reality you need 20-30 bottles to get a single day's dose! It's insane. I've been trying to avoid company names in our interview. I just want to give people the information and they can sort it out for themselves.

Bill: They're smart enough. Thanks for your time and information.