Your Deep Clean Blueprint: Part 1
Interview With John Banta

KS

Kendra Seymour

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Hello everyone, my name is Kendra Seymour, and welcome to another Change the Air Foundation interview. Now, I am so excited today to be joined by our guest, John Banta. And we're going to be talking about cleaning for a healthier environment. So whether your cleaning is part of post-remediation or normal routine cleaning… Or maybe you're in a situation where you have some mold and water damage, and you can't deal with it right away, and you're trying to reduce exposure… I promise you, this episode is going to be incredibly helpful because everyone can benefit from this kind of cleaning. And the part that I think people are gonna find shocking, as you will hear, is you really don't need magic sprays and fogs and harsh chemicals, really, at any point in this process. So that said, John, thank you so much for being here.

JB

John Banta

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Well, thanks for having me.

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Kendra Seymour

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Yeah, for those who don't know John yet, he's certified by the American Board of Industrial Hygiene as a Certified Industrial Hygienist with a bachelor's degree in environmental science, and 37 years of experience in indoor air quality. For the last 27 years, John has specialized in mold and water damage in buildings. He's conducted investigations and supervised crews in water damage, flood, and mold remediation throughout the United States. He's trained workers in restoring water-damaged buildings, contaminated water cleanups, mold remediation, worker health and safety programs throughout the United States and Canada, as well as England, Australia, and New Zealand. John currently

specializes in medically important investigations, with 85% of his clients referred to him by their physician. John is the co-author of the book titled Prescriptions for a Healthy House Fourth Edition, a Practical Guide for Architects, Builders and Homeowners, and author of Extreme Weather Hits Home: Protecting Your Buildings from Climate Change. John's upcoming book, Mold Control is about recovering buildings from mold and other water damage organisms, finding, avoiding, and fixing problems. I love it. John, this is fantastic, the resources you've provided and everything we're going to talk about today.

JB

John Banta

1:58

Well, thank you, thank you very much.

KS

Kendra Seymour

1:59

Okay, so I want to jump right in because there's so much to cover. But before we get to the nitty gritty of the cleaning, and all of that… You kind of have a personal connection to how you got into this space. Can you tell us briefly about that?

JB

John Banta

2:15

Well, there's never just one thing that causes a decision like that to be made. I was actually a research technician at the University of California Davis. And very into the science rules of things. I was certified by the FDA in good laboratory practices. And my wife and I ended up purchasing an old Victorian house that hadn't been remodeled in about 40 years. And I proceeded to get it ready to paint the outside. And I started sanding and burning the paint off the outside…ended up poisoning my entire family with lead. So we all ended up having to undergo chelation therapy. And it was especially traumatic for our two-year-old. I mean, her lead blood level ended up being, I think it was, 56 micrograms per deciliter of blood. Now, the action level back then…this was in 1982; the action level was 40. Today it's, I think it's still 10. And they've been working at getting it reduced down to five. I'm not sure if that's actually been completed yet.

But you know, the experts out there saying that there really is no acceptable lead level in people. And so that was one thing that got things started. But what really ended up focusing me on mold problems and water damage problems in buildings was that my wife ended up having a health crisis when she was approximately in her mid-30s. And we're now approaching 70. But in any case, that health crisis turned out to be because she was hypersensitive to mold. And back then nobody was practicing…none of the medical practitioners had any clues about you know what mold was all about or the problems that it could cause. And so we were pretty much on our own. And I will admit that I had some real skeptical times as well working through the process. But what was clear to me…we were avid campers, I mean, when we were first married (we've been married 48 years now)…when we were first married, we were out hiking and camping and doing all kinds of stuff. Every summer we'd be up in the High Sierras for at least two weeks. And after she got sick, her dad called me. Her dad had started going to this one particular area in the Sierras when he was five years old and he continued it with his kids. And we continued it with our kids. But after Trish got sick, he called and said, "We know Trisha isn't feeling well. And we'll understand if you guys can't make it, but we're heading up for two weeks, and we'd love to have you." And when I talked to Trish, she said, "We're going," you know, "I can feel, I can feel lousy in the mountains and surrounded by nature, as well as I can here at home. So we're going to go." And I think one of the things that really impressed me with that trip, about day four, she started feeling good. By day seven, it was like, there was nothing wrong. And that entire second week was just, you know, it was like, we were newlyweds again. I mean, it was just a wonderful trip. We got home afterwards and within minutes after entering the house, her symptoms started coming back, by the next morning, it was like we'd never left. And so that caused me to double down and really start looking more seriously at mold and water damage problems. And, you know, the problem was, we didn't have very good testing techniques for things back then. Today, we do and I think that later on, we're probably going to be talking about some of those testing techniques and some of the critiques that they've been receiving (which I think have in many cases

been unfounded). Or, you know, I mean, any methodology can always stand improvements, but we'll get into that later I believe.

KS

Kendra Seymour

6:44

Yeah, you know, I'm so sorry, that happened to you. What you describe, we see that happen more often than people realize, this. Teachers or students...you know, if the school is the source, and they come home for the summer and they start feeling better. Or somebody, like to your story, goes out of town for a week or on vacation, and they get better and they come home… And then it's kind of the first clue sometimes that maybe there's something going on in my environment. So it's actually a perfect segue into my next question. For those who may be newer, let's just lay a super quick foundation. What microbes or particles are flourishing in our homes? You know, when there's water damage, you know, mold spores, mycotoxins that kind of thing, bacteria… And why is it important to remove those from our environment?

JB

John Banta

7:29

Sure. So there's a wide variety of different types of microorganisms. And we oftentimes hear everybody talking about mold. And mold certainly can be a major issue (or at least certain types of molds can be a major issue). They're not all bad. We've got the molds that are used for making, you know, cheese and wine and beer and, and all kinds of other preserved sorts of foods. And, we've got lots of medicines that have developed from different types of, well, biotoxins that have been produced by molds. Penicillin is a biotoxin, as far as bacteria are concerned, and yet, it's managed to save probably millions of lives since its development. And so, you know, not all molds are bad, but not all molds are good either. And, certainly, that's one part of it. But we're seeing that there are a lot of issues with bacteria, and actinomyces bacteria are one of the major groups of bacteria that has had connections with causing problems. Those bacteria produce toxins that are called exotoxins. And exotoxins are produced by the bacteria throughout their lifecycle and exuded by them out into the environment. And so, there are

a lot of people that end up with inflammatory types of conditions and other medical conditions based on toxins from bacteria. And then gram-negative bacteria are the ones that are most commonly associated with sewage, and gram-negative bacteria produce endotoxins, which are another form of biotoxin that can create a huge problem for people when they get exposed to them. So you know, the key thing about bacteria… When a water damage occurs, it only takes a few hours for them to leave their dormant type of state and become reactivated and start going through cell division. And they divide and with some bacteria, you might have a complete lifecycle occur every 15 minutes. So four times an hour, doubling, you know, 1 goes to 2 to 4 to 8 to 16 to 32 to 64. And before long, you're up in the billions. And so bacteria, I think, is a major issue with water damage that has not gotten as much attention as it deserves, because we keep focusing our attention on mold. But you know, mold… typically it takes two to three days to germinate, and maybe a week to become well-established for some of the faster-growing ones. But some of the slower-growing ones might take a month or even longer to actually become well-established. But mold has gotten a lot of publicity or press. And some of it's been sensationalized, but other things about mold are certainly well-founded. And so if we've had a water damage long enough for mold to develop, then there's a good chance that bacteria have already become pretty well established. The good news is that a lot of the same techniques that we use for mold, for remediation, and cleanup are the same for bacteria. And so it's not like we have to apply separate principles for each of them, although there are some differences. But for the most part, if you're taking care of one, there's a very good chance that you're taking care of the others.

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Kendra Seymour

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Well, that is a little bit of good news in this process. Because, you know, people are used to I think…they know they can see visible mold when it's visible, they get it. And what they don't realize is there's a lot more going on that you can't see. The spores in the air, fungal fragments (which occur at significantly higher number), the bacteria and VOCs, those gases that are put off. And so I love that we're going to kind of tackle some of

the specifics today. So while we're not going to get into remediation, we're really talking about just cleaning the rest of your home, if you have visible mold growth or water damage, you want to take care of that. Hiring, you know a properly vetted remediation company and we have resources on our website, ChangeTheAirFoundation.org. But let's talk about what you, the homeowner or renter, can do. And you are kind of famous for sharing what is known as your small particle cleaning or fine particle cleaning process that takes care of removing some of these particles that have stepped out into our environment. So tell us a little bit about what that small particle cleaning process looks like. What materials does it work on? That kind of thing.

JB

John Banta

12:26

Sure. So the term that I tend to use is “effective cleaning”. And, one of the reasons for that is so much of the work and cleaning that people do…they're actually just moving it around from one place to another. If they're lucky, they may be diluting it down some but they're not really being truly effective at getting rid of the mold and the microorganisms. And I think one of the reasons for that is because you just can't see them with the naked eye. When they're at high enough levels to cause problems from a spread of spores and fragments and particles, they're just not going to be dense enough to even tell that they're there. They're going to blend in with the rest of the dirt and dust that's present in the building. And so we can use dirt and dust as a surrogate to help give us an idea when surfaces really are clean. But for people that have medical hypersensitivities, we even need to go beyond (quite a bit beyond) what a simple paper towel or a terry cloth rag is going to tell you in terms of how clean an area is. And so one of the things that I spent quite a bit of time studying was the cleanroom industry. In the cleanroom industry where they're manufacturing electronics parts or pharmaceuticals… Even the tiniest amounts of dust or debris can end up interfering with the manufacturing process and ruin, you know, umpteen dollars worth of product before they figure out that they've got a contamination issue. That's creating a problem for them. And so they go to extreme measures to make sure that their environments are truly free, or at least the lowest

possible level of the particles that they can achieve. And the good news with mold is that we can use a lot of the very good things that come from the cleanroom industry for cleaning our environments. But we don't have to go nearly as far as what they have to go. And so the expenses are not nearly as much. One example is the use of microfiber cleaning cloths. In the cleanroom industry, I mean, they spare no expense to get lint-free cleaning cloths. Because it doesn't matter, you know, what the nature of the dust or debris is. Even lint that comes off of a microfiber cloth can be enough to bugger up the works. And so they might spend, you know, 5, 10, even 100 times more on their cleaning cloths, in order to get things under control, than we have to. Unfortunately, there are a lot of microfiber cloths that are being sold to the consumer, that…they put out lint, but so what? It's not that big of a deal. And so instead of having to pay several dollars per wipe, we can get away with paying, you know, 20 to 50 cents per wipe and do quite well with that. Now, one of the things that I learned a lot about from the cleanroom industry was microfiber cloths. And there are microfibers that are reusable, and there are microfibers that are disposable. And for this type of work, I actually prefer the disposable ones over the reusables. And I know people are cringing because you know we're filling up our landfills. But when you have someone that has medical sensitivities and issues, the problem is that it's very difficult to get the reusables clean, using the techniques that we have available to us. And so when a microfiber cloth is cleaned commercially, for re-use, they need to get the temperature up to a level between about 165 degrees and 185 degrees Fahrenheit. And what happens when it gets up to that temperature…the fibers that are in that cloth, they untwist. And when the fibers untwist, that's what allows those contaminants that are mixed in with the fibers (that have been locked into the fibers with molecular forces and electrostatic forces) to actually be washed out. And to get that reusable clean. And so typically, the professional companies that are cleaning microfiber cloths…they have some very expensive equipment that can get the temperature up to 165 or higher, and hold it there for an extended period of time. They'll typically launder them for about 45 minutes using special detergents and surfactants that help to bring the contaminants out of the cloths. But what happens is the fibers they untwist. And so as they agitate, and as

they spin dry, these various particles (that we don't want to have in our environments) are washed out and go down the drain. When they finish their process of washing them through these cycles and they cool down, those fibers twist back up again. And now they're ready, reactivated, and ready to do more cleaning. And you know what, the way we do these things that the methods that are used are so important. There are a lot of people out there that have talked with me at times, you know, telling me "Oh, well, I know that I've got to get my microfibers hot enough in order to get them clean. So I boil them." Well, boiling can damage the fibers. You know that temperature range is pretty specific. And not only that, but cleaning a microfiber cloth for 45 minutes by hand, by keeping the water hot and all those things. It's just not really practical. I think there's one other environmental reason why I'm not a fan of reusable microfiber cloths. And that is because the microfibers do wash out. They get into our lakes and streams and water supplies. And there's now evidence that those fibers are ending up being taken in by fish and mollusks and other things, and then concentrating in the tissues of those organisms. I'm not aware of any evidence of that happening with people yet. But you know, we don't breathe through gills we're not taking them in the same way. So I think that that's an important consideration. In addition, the sewage treatment plants (where the water is supposed to go through) they're having huge problems with these microfibers that are released as a part of the laundering process. Forming these giant balls that end up gumming up the works... And can you imagine having a sewage pond that's filled with 1000s of gallons of sewage, and all of a sudden the mechanisms are no longer functioning the way they're supposed to? So you got to get all that sewage out to a point where you can go in and manually clean up the clogs. Not the type of job that I think anybody would really like doing, but an essential one. And yet the reusable ones do tend to cause these problems. Now, I know they're putting better filters in and doing all kinds of things to make that less of a problem. But I think it's better to put the microfiber cloths into the landfill, where the fibers aren't going to end up being released.

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Kendra Seymour

20:12

Yeah, and if it means you can save a piece of furniture or you know, items, that's going to take up less space in a landfill. You know, as opposed to throwing out your wood desk, or whatever it is, you're attempting to clean. So I know that microfiber cloths can be significantly, you know, better at trapping these fine particles than paper towels. So I'm sitting in my office, there's not much in here. I have walls. This is the most, this is as much furniture other than the desk that I have here, how would I go about cleaning this room? What…is there like a step-by-step process? I take my microfiber cloth. Do I use it dry? Do I use it wet? Kind of take us through a scenario.

JB

John Banta

20:53

It really depends on what you're trying to accomplish. And so one of the primary differences that those of us that have been involved with this are finding, is the difference between mold and bacteria. Mold tends to settle downward, and it's up on horizontal surfaces. And so the biggest horizontal surface is the floor. But we have other counters and tops of cabinets and shelves and, things like that, that it also tends to settle onto. And so cleaning the horizontal surfaces is extremely important for mold. They tend not to settle horizontally or vertically, they tend not to land on vertical surfaces. They tend not to stick to the ceiling. There are some situations where you may have some mold that still adheres. You know, if you've got particularly greasy surfaces (like you would if you were doing deep fat frying or something like that), then the walls may need more attention. And the ceiling may need more attention. But in most circumstances, really the horizontal surfaces are the biggest most important place to put our attention. Bacteria, on the other hand, they do seem to show up more frequently on the walls. Not so much on the ceiling, but on the walls. And I'm not sure we have a really good understanding of that yet. But I suspect that a lot of it may have to do with touchpoints. We learned a lot from COVID-19 about, you know, touchpoints and how if we…if we're sick, and we get it on our hands, and then we touch the doorknob or we put our hand on the wall or things like that we can transfer the virus that way. And I suspect that the same thing is oftentimes true with regards to bacteria. You know, you sneeze

without covering your face. And now you've projected all this sputum and other things onto the wall. And that's where a lot of these types of bacteria may, in fact, harbor.

KS

Kendra Seymour

23:00

So if I'm going to start cleaning, I'm going to start with those horizontal surfaces. And you know, maybe I haven't dusted in a while, should I start with a microfiber cloth? Or should I start with like a HEPA vacuum, and then move to the microfiber cloth?

JB

John Banta

23:15

I typically like to start with a HEPA vacuum cleaner if I have a floor that has visible dust and debris on it. The HEPA vacuum cleaner is really good at picking up the larger particles and chunks…dust bunnies, and things of that nature. It's not so good at picking up the really fine stuff. And the demonstration of that is, you know, if I take a handful of flour and I dust it onto the floor in my kitchen, I can see the flour there. I know it's there. If I take a HEPA vacuum cleaner, and I vacuum that flour up, I look at the floor. *Hey, it looks clean. Not bad. We got it all. We took care of it. Right?* Well, if you take your finger, your finger is actually a better cleaning agent than, you know, like the HEPA vacuum cleaner. So you take your finger and you rub it across the floor and you look at it. And you're gonna see that you've got all this flour that you picked up. Now, flour particles tend to be approximately the same size as mold spores; somewhere in the 2-5 micron size range when it's finely ground. And so it's an excellent example of how that layer of fine particles sticks to our surfaces. And I am becoming more and more convinced that a good cleaning of horizontal surfaces, like the floor, is probably doing a better job for our air quality than most room air purifiers. And the reason for that is because those fine particles end up sticking to the floor first. They're going to be attracted to the floor. They're going to be sticking to the floor, first and foremost. And that gives us time to keep the clean floor from releasing what builds up. When you get a, you know, a bunch of dust and debris on the floor. At that point, yeah, things can end up being stirred

up. And that's when an air purifier would have its advantage. But the thing with air purifiers is their capture zone is pretty close in, pretty tight into the equipment. And so, you know, if I had an air purifier running in this room, I would probably want it approximately arm's distance away from me and at approximately the same height that I'm sitting at. Because that's where it's going to do its best job from the standpoint of stratification of air and bringing things in. So setting it down on the floor is…or setting it on the far side of the room, or even worse, setting it in another room across the other side of the house. I know some of them say that they'll clean a 2000-square-foot house, but in reality, they're going to do the best job in the area where they're placed. And when they're close to you, as opposed to some distance away.

KS

Kendra Seymour

26:00

That's a good reminder. And for others listening if you want more I did an interview not long ago with Carl Grimes you can find that on our website if you want to dig into air purifiers and cleaners a little bit more. We're gonna get a little bit more into the detail of cleaning. But before we do, I want to just touch a little bit more on vacuums, because I've always found I love vacuuming. I love a good vacuum. I find it very satisfying, but not all vacuums are created the same and in some cases, they can make the situation worse. So if I…before I, you know, go to vacuum my office, what are some tips we want to think about when buying or using a vacuum that we're not accidentally making the situation worse.

JB

John Banta

26:40

So, you know, even HEPA vacuum cleaners don't necessarily do a very good job. Now your non-HEPA vacuum cleaners just spew the fine particles right back out and into the air where they end up settling again. So it's a…you know, you're recycling your particles, so you don't want to have in your indoor environment. But with a good quality HEPA vacuum cleaner, it's going to be pulling out the particles. It's gonna collect them. HEPA vacuum cleaners are rated to remove 99.97% of particles at 0.3 microns. And 0.3 microns, that's a sub-micron particle. That's, you know,

approaching nanoparticle size. And, so one of the advertising things that drives me crazy is when it's implied that, you know, this air purifier or vacuum cleaner does a better job because it's got an ultra-fine particulate type of filter in it that's so much better than HEPA. And the thing that most people don't realize is HEPA filters…actually, at 0.3 microns, that's their least effective level for collecting particles. If something is bigger than 0.3 microns, it's going to do a good job by sending them out. That's an important way that it removes those large particles. But when you get down into the sub-micron size particles, the efficiency of HEPA filters actually gets better when you get smaller and smaller and smaller. And that's because of various types of electrostatic and impaction and collision types of forces that occur between the micro-fine particles that are floating around in the air, and the matrix that makes up the HEPA purification unit. So when we get into those really tiny particles, they don't actually float around the same way that the big things do…that the big particles do, like mold spores are big in comparison to the ultra-fine particles. Instead, we have this Brownian Motion where they're just going all over the place. And what that means is that as the air is passing through the HEPA filter, there's a very good chance they're going to impact with one of the fibers. And they're going to end up sticking because of either electrostatic or molecular forces. And that holds on to them in a very good way. And that's one of the things about microfiber cloths that make them so good…is you've got both molecular and electrostatic forces, that when you wipe a surface, the particles preferentially go to the microfiber cloth and stick to it. So it's really the same...not exactly the same technology, but it's the same principle from the technological standpoint that helps both of these things work. And it's just such a powerful force for collecting small particles that, you know, we can take advantage of it. And it's one of those things that I think we just don't utilize this as much as we should. Especially when somebody is really hypersensitive to these tiny types of particles.

KS

Kendra Seymour

29:57

Yeah, so…

JB

John Banta
29:58
So, but your question was about the HEPA vacuums. So there's a gentleman, actually a couple: Bob and Gail Brandies. And they did research looking specifically at HEPA vacuum cleaners and testing them. And what they found was that fewer than 50% of them were working the way that they were supposed to. And when I was out in the field doing my investigation...so I would carry a particle counter around with me, and I would check people's HEPA vacuum cleaners to see how well they were functioning. And I found that it was probably not even 50% effective. That they were, they were missing an awful lot with regards to the filtration, and it was probably not because of the HEPA filter that they had in them. But because of you know, the filter didn't seal tightly, it didn't have a gasket around it that was sealing properly. Or somebody didn't align it carefully when they put it back together again, or something like that. And so, you know, it's still going to do a good job picking up the dirt that's larger size. But to really help us with the micro-fine particles, we need to have a properly functioning HEPA unit. And, that's not going to get at all, like I said earlier, you still need the microfibers. But, it does a good job of helping us to pick up what we can that way, so that we don't end up loading our microfiber cloths real early. We can use a microfiber cloth, probably 10 times longer if we're HEPA vacuuming first, than if we're not HEPA vacuum.

KS

Kendra Seymour
31:38
Okay, so it sounds like a sealed HEPA vacuum. It's not enough just to put a HEPA filter in a vacuum. You want to make sure that it's not, you know, leaking air from all those other areas. And it sounds like vacuuming alone is not enough to overcome that electro, you know, magnetic charge (between particle and building material), which is where the microfiber cloths come in. So let's dig into that a little bit more because people talk about damp wiping with microfiber cloths. What…let's get into the chemical conversation. Because this is probably one of the most confusing and overwhelming topics for someone who just…they just want to remove these things from the environment. And so you'll see

recommendations for like vinegar, hydrogen peroxide, bleach, essential oils. Talk to us a little bit about those and maybe fold in, you know, an explanation on surfactants and how those work.

JB

John Banta

32:36

Okay. So if we go, if we take a look at microbial physiology… So we're looking at these organisms under a microscope, and we're analyzing, you know, the various layers that's going to be present in the particles…almost all of the molds are covered with a hydrophobic coating. And by hydrophobic, I mean, it repels water. And the way it does that is through lipids or fats. So we've got this fatty coating on the outside of spores and fragments and things like that, that prevent water from entering. Which is one of the reasons that it takes a lot longer for a mold spore to germinate when it gets wet, because that water has to soak for two or three days in order to penetrate to a point where it's able to activate the spore and begin that germination process. And so we have biotoxins that can be produced by the mold and the bacteria. And those biotoxins...they're either going to be fat-soluble or water-soluble. And then with the different bacteria, our actinomycetes bacteria are bacteria that are gram-negative and produce the endotoxins. All of these have a bilipid layer on the outside of them. By lipids again, I mean fats. And so the best thing that we can do to clean them up is use soap or detergent, or surfactant. And it's just all so simple. And we don't need to supplement it with anything. So if you are adding an essential oil to a detergent, what are you doing? Well, you're neutralizing the part of the detergent. Oil is going to neutralize a detergent. And there's only so much oil or grease that detergent can pick up before it gets used up to a point where it's no longer going to be effective. So by adding essential oils, we're actually making that less effective at cleaning. Now, not only that, but quite a number of the essential oils that are out there also can have an inhibiting effect on the DNA types of methodologies that are used for the diagnostics. I believe we're probably going to be talking about ERMI and MSQPCR a little bit later on. And so you can actually create a situation where you haven't gotten rid of the contaminants. You just made it so that the test results can't show them. And I think that

that's a real problem. Another thing that we oftentimes hear about is, “Let's add some vinegar to our detergent to make it more effective.” Well, the problem there is basic chemistry. If you're mixing positive ions with negative ions in a solution, then basically you cancel them out, and you end up making water in a salt. And that's exactly what happens when you start adding vinegar to detergents that are negatively charged. And you neutralize them. And so they're not going to be as effective. How do you know whether you're adding the vinegar to the right product? Well, I don't think it matters. I think that if manufacturers could make their product better by adding some vinegar to it, they would do it. It would be done right as a part of the manufacturing process. And so getting this idea that we can improve on what the manufacturers are already doing, especially with quality products. I'm a real fan of Branch Basics detergent. I find that, you know, the people that have made it… I've known them for almost 35 years now. I knew them when their son was the boy in the plastic bubble, and literally quite sick. And they worked with chemists to develop this line of cleaning products. And so when it comes to multiple chemical sensitivities, I think it's probably one of the best out there. But certainly if you don't have access to it immediately, there are plenty of free and clear types of products (that are being sold at the local market) that are going to do the job in terms of the cleaning. But the key is whether or not you have a sensitivity to the fragrances or the other types of things that get added to it. But when we start fooling around with the chemistry, and start thinking that we can improve on the manufacturer's process, oftentimes we end up interfering with it and making things worse. So when I go into a moldy environment to clean it, I want to wait a few hours after the last major activity to allow things to settle down. Depending on my ability to clean with a HEPA vacuum cleaner or not. I might even vacuum the night before, let it settle overnight. And then do my microfiber cleaning the first thing the next morning after things have settled. But what I will typically do for floors and other surfaces (that are not going to be damaged by a moist wipe type of situation) is I will damp wipe using a solution of five drops of detergent to a quart of water in a spritzer bottle. And we don't spray the floor, or we don't spray the surface that we want to clean. In fact, I just had a client call me the other day. She had been using the methodology

that I'm going to be talking about in more detail in a minute. But she had a housekeeper that came in and just took the spray bottle and just started spraying water all over the wood floor and ended up causing it to start to buckle. So you know, I mean, liquid…too much liquid can cause damage, and we don't need much liquid. And so five drops of dish detergent to a quart of water and a spritzer bottle. We put our microfiber wipe (whatever it is) onto a mop pole that's designed specifically for that purpose. So never a string mop, never a sponge mop or anything like that. It's a microfiber mop that we're using. And we spritz it, I usually will spritz it about three times. That's all that you need. And then I'll start doing edge cleaning all the way around the perimeters. And I'll do "S cleaning", which is a serpentine pattern. And again, this is something that's been studied by the cleanroom industry. It's one of the most effective ways to be able to clean if you're scrubbing back and forth like this. You know, even if it's with a microfiber cloth when you're moving forward, you're pushing some particles ahead of that cloth. And they haven't been thoroughly entrained into those twisted fibers yet. And when you move backwards you leave that buildup sitting on the surface. And so by scrubbing back and forth, we don't do as good a job as we can. What we want to do is we want to use an S cleaning motion. That the leading edge of the cloth is always going in the same direction so that we're not leaving stuff behind. And then the same with edge cleaning when we're going around the perimeter. If, for some reason, we end up with the mop skipping…it hits a bump or something and it goes boom, and it misses a spot. We don't back up and scrub it, we lift it up, we go back a little bit before we where we left off. And then we start again. And we go a little bit more slowly over that bump so that we don't end up becoming airborne, as we're doing the cleaning. And, basically, we do that until we can clean 40 square feet, and look at the wipe and see that it still looks clean. And so that doesn't mean that you have to change your wipe every 40 square feet. But what I'll do, you know, like I'll kind of in my mind layout a four by 10-foot area. And I'll start cleaning that using the S cleaning. And once I've come to the end of that 40 square feet, I stop. I look at my mop (my microfiber mop cloth) and I see whether I see any visible dirt on it or not. Which is one reason that I like to use white microfibers because the dirt shows up on it much better than the colored

ones. But if I see any signs of dirt or anything like that, that tells me that I'm going to need to go over everything, at least one more cycle…one more time. But that doesn't mean I'm going to stop. If the microfiber cloth is fully loaded, then I'll stop and change it out. But if it's not loaded, I keep going. And I'll keep cleaning. And I'll do maybe another 40 square feet and stop and look and another 40 square feet and stop and look. And I'll keep doing that, to see just how much I've been able to pick up throughout the process. And I use what I see. So it's kind of a modified white glove test when you're, you know, wiping your finger over a surface to see what you get.

JB

John Banta

42:00

It's a way of using the microfiber cloth to answer the question, "Is it clean? Or do I need to do more cleaning as another cycle?" So instead of going over the same area over and over again, sequentially like that… what I'll do is I'll clean an entire area. I'll break the house into logical increments, and I'll work on one room. And I'll go through that room and clean and clean and change and clean and change and clean until my wipe is coming back clean that for that particular area. Now, if I've decided that maybe I need to be doing my walls or my ceiling, I'll start with a clean wipe. And I'll do 40 square feet of wall or I'll do 40 square feet of ceiling. You can use these microfiber poles to stand on the floor and reach easily an eight-foot ceiling. You can even add extensions onto the poles and comfortably do a 10-foot or 12-foot ceiling standing on the ground. But again, 40 square feet… I'll go in and I'll test it first. So if I do 40 square feet of ceiling, and I look at my wipe and it's clean, I'm probably not going to continue with the ceiling. It just doesn't need it. I might do different sections of walls (40 square feet), just to see whether or not I've got some spots that are not very clean. And certainly, certain areas are going to be more likely to have visible dirt accumulation than others. Kitchens because of all that grease. But the beauty of this method is that the water-soluble biotoxins that are present on surfaces get picked up by the water component in the spritz and go right up with the particles into the microfiber. And the fat-soluble ones get emulsified by the detergent and picked up. And right up into the microfiber as well. So

we are able to cover all the various components that could be problematic with regards to mold. We're taking care of the particles with the microfibers. We're taking care of the water-soluble components with the dampness and we're taking care of the fat-soluble components with the detergent. And so, you know, supplementing with all these other fancy things that just isn't necessary. And, you know, I get very frustrated with the products that claim to kill, you know, “Oh, it's going to kill and it's going to be perfectly safe.” Well, maybe the 76% of the population that is not predisposed to mold sensitivities, genetically, isn't going to notice the difference. I mean, they're the people that are out there buying the fragrance products at the supermarket all the time and falling for the commercials that are telling them how you know, “Oh, just use our,” you know, “perfumed device,” or whatever it is, “and it's going to eliminate those odors!” Well, it may not eliminate them so much as it makes it so that your nose is no longer able to detect them, even if they're still there. We want to physically remove these things. And not try to kill them with chemicals that can cause adverse reactions in people that are hypersensitive. So I mentioned the 76% of the population that is not predisposed genetically to sensitivities. Then we've got the 24% of the population that is genetically predisposed. But that doesn't mean that they're actually reacting to it. So in reality, it's 1-4% of the population of the United States that's probably been sensitized to the point where they're reactive. And so, in order for people to get sick from these things, you've got to have a cascade of things that go wrong or that happen. So first, you’ve got to have the mold problem or the water damage problem that's resulted in the bacteria. And if they don't exist, then, you know, you don't get sick off of what's not there. But then you also have to have a pathway for those contaminants to work their way out of the wall cavity, if they're hidden. In a crack the size of a human hair is like a freeway for mold to escape from a wall cavity. And so how does that work? Well, your typical human hair, if you have human hairs, is about 100 microns in size. Your typical mold spore is about 2-20 microns. And so you can easily fit lots and lots of spores in that size area of a human hair. And most of our homes do have, you know, like a crack where the top of the floor meets the bottom edge of that baseboard. That is the size of human hair, at least in some places. There will be touchpoints where it's not

going to have that crack. But for the most part, we've got plenty of cracks that are that size, or bigger. And, so it can work out. But it's not going to work its way out unless there's a pressure differential, bringing it out into the living environment. And so in order for it to come out and contaminate our environment, we've got to have the source of the mold or bacteria, we've got to have the pathway, and we've got to have the pressure differential, that's bringing it out. And if you are missing any one of those three, then you're not going to have the contaminants working their way out into the living space. And so when we go in and test a building to figure out what's there, from a mold or bacteria standpoint…if any one of those three components aren't present, we're not going to be finding the mold. But it's not going to be coming out and affecting people either. So I think, that this cleaning process is really, by far, the best. It doesn't rely on trying to kill. Because I was in a building… I worked on a building where they had sprayed it five times with chlorine bleach. And after five treatments (and this is after all the gypsum drywall and all the insulation had been removed), and they sprayed it with chlorine bleach five times. And we were still able to come up with viable particles of the mold that had grown there. We were still able to grow it on petri plates. And we were able to put it under a microscope. And the lab was able to actually visualize it, sort of. I got this call from them saying, "You know, this sample that you sent us is really funny. We're looking at it and we see the shadow-like shapes under the microscope. But it's not until we add a stain to the particles on the slide, that all of a sudden they jump out at us. And it's just like, you know what we normally see with mold once it's been stained. What happened in this building?" Well, this building was treated with chlorine bleach five times and what does bleach do? It bleaches out the color. Made it a whole lot harder to figure out what needed to be remediated, because we no longer had the discolorations or stains or visible growth to guide us with regards to where the problems were. So not, not a fan of these types of things. And killing, it oftentimes doesn't work. And if it's something that's designed to kill, good chance, it's going to be problematic for people, children, even pets. There's one website…a physician who specializes in herbal medicines and essential oils for treatments which can be very good for you know, medicinal purposes…but for spraying them all over a

building instead of it being you know, like a few drops of something as a treatment…it's a gallon of something all over the place. It can oftentimes create some real nightmares in terms of what happens. And this particular veterinarian website they warned against you using various types of phenolic-based essential oils like tea tree oil, basil oil, thyme oil. Various types of citrus oils also have phenolics in them. And so I'm not a fan, I have not found them to be effective. And I've had so many people that have ended up with their house being if not ruined, in the long run, at least in the short run, it hasn't worked for them. And I have had several people that have ended up having to move just because they couldn't get the essential oils back out again.

KS

Kendra Seymour

50:33

Yeah, John, I'm wondering, there's still so much I want to dig into. You were hinting at inhibition and testing and we just don't have time to get there. So I'm wondering if we could call this Part One. And if you'll come back and do a Part Two, and we can kind of continue this conversation.

JB

John Banta

50:46

I'd be delighted.

KS

Kendra Seymour

50:47

Yeah. So to wrap up this section, because there's a couple of things I want to highlight for listeners. I love that you talk about that there has to be source area and area of growth. And then a mechanism for it to get into our environment. And I love that you reiterated that it is possible for mold behind a wall or water damage, bacteria or underneath the floor to impact your living environment. And that happens with pressure differentials. And I want to highlight what those look like for the listener. So if you turn on your oven range hood when you cook, that changes the pressure on your home. If you run your dryer that changes the pressure in your home. You know, opening and closing doors, can also change the pressure in your home…your HVAC system. So these things are

happening, even if you aren't aware of them. And then to kind of wrap it up… I… just to reiterate…because I know somebody out there...there's… for people who've been at this a while, they know mycotoxins, (which is…are the secondary byproducts produced by mold under certain conditions) are poisonous, they're not living to begin with. So they say, "All right, well, we can't kill something that's not living." But you're saying that that doesn't matter because using a surfactant is going to remove these spores or any mycotoxins or bacteria from the environment. Am I understanding that correctly?

JB

John Banta

51:57

It emulsifies them so that they're easily picked up by the microfibers.

KS

Kendra Seymour

52:02

Yeah, yeah, you…I think you were doing an interview with Scott Forsgren and I loved it. Just a last point…you talked about how even like the oils in our fingers or from cooking can absorb those mycotoxins. And so the things that we use to remove oil from our dishes, right? It's the same process…can remove those oils that may be coated with mycotoxins. So John, we're gonna do a Part Two. Are there any last thoughts? And then I want you to tell us how you know, people want to find you and your resources, how they can do that. But any last thoughts?

JB

John Banta

52:32

Oh, thank you. Well, you can go to www.JohnCBanta.com. That's my author website. I want to mention our book Prescriptions for a Healthy House, very proud of it. Within the last three months, it's been on Amazon's number one seller as a design and construction book…green and sustainable design and construction. And this is the fourth edition. Paula Baker-Laporte and I have been working on this…the first three editions over 25-year period. And now we've got our final edition out and just very excited about it. There is a real renaissance occurring in terms of people being interested in these things. We have sold more

copies of this edition than other editions combined. And so very, very excited about it. People are interested in healthy living now like never before. There are fewer people with sensitivities that are being referred to as being crazy. Although it still happens, you know, we've got some more educational work to do. But, I think that we are really at a turning point in terms of there being an awareness and all this is good, and it's gratifying.

KS

Kendra Seymour

54:03

Yeah, well, thank you so much. I couldn't agree with you more. You know, we spend more time than ever indoors. And so what's in our air or what's in our environment absolutely matters. For those listening, we're going to pick up with Part Two. We're gonna get into a little bit more of that inhibition, and testing, and some of the other great things that John has to share. So be on the lookout for that when that is released. And, John, I just want to thank you again, so much for giving your time and your process. And helping us understand how you know, we can clean, you know, our home so that it's healthier. So thank you.

JB

John Banta

54:36

Thank you.

KS

Kendra Seymour

54:37

And for everyone listening, do me a favor if you found this interview helpful. Like, follow, and share us on Facebook, Instagram, LinkedIn, or you know, even on our new podcasts. And if you want to make sure that you never miss a great interview like this, head on over to ChangeTheAirFoundation.org. Sign up for our newsletter because it really is the best way to get great interviews like this directly to your inbox. We'll see you next time. Thanks so much.