

Interview with Material Chemical Expert Dr. Marilyn Black

Introduction ([00:02](#)):

Welcome to Green Building Matters. The podcast that matters for green building professionals. Learn insight in green buildings as we interviewed today's experts in LEED and WELL. We'll learn from their career paths, war stories and all things green because Green Building Matters and now our host and yes, he has every LEED and WELL credential. Here's Charlie Cichetti.

Charlie ([00:33](#)):

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Charlie ([01:01](#)):

Hi everyone. Welcome to the next episode of the Green Building Matters Podcast. I'm having a ton of fun interviewing green building professionals somewhere in the world, and I've been doing it now, believe it or not for over three years today. Since I'm based in Atlanta, it's a special guest, also a Georgia Tech alum, so that's special to my heart. We've got Dr. Black, Marilyn Black with us, and I would say she is known amongst our fellow colleagues here in Atlanta, especially in the industry as really THE pioneer on the healthy material side of things, the indoor air quality side of things and her early work with GreenGuard and so much more. Dr. Black, appreciate you coming on. I can't wait to interview you and hear more about your story. How are you doing today?

Marilyn ([01:44](#)):

I'm doing great. Thank you so much for having me.

Charlie ([01:48](#)):

If you could take us back. Where did you go to school?

Marilyn ([01:52](#)):

I grew up actually in Rock Hill, South Carolina. My dad actually worked in Charlotte, North Carolina, but we moved 20 miles south and lived in Rock Hill,

lived there from the time I was young up through high school and then left to go to college. I went to the University of Virginia to attend undergraduate school. From there went to University of Florida, to obtain a master's degree in chemistry. I went there specifically to work with a particular professor who was researching trace levels in indoor materials. I finished my PhD at Georgia Institute of Technology a few years after that.

Charlie ([02:44](#)):

How did you know chemistry because looking at your LinkedIn bio and the degrees and the advanced degrees you have is chemistry, chemistry, chemistry. Did anyone have an early influence and nudge you in that direction?

Marilyn ([02:57](#)):

Yes, all of my degrees were in chemistry and probably when I first started college my intent was to go to medical school. I thought I wanted to be a practicing physician, but once I got into undergraduate school, I would say that I had a particular chemistry professor who very significantly influenced my career. His name was Dr. Bernard Mahoney. I can see him very clearly today, but besides being enamored with his very Bostonian an accent, he really taught me the value of hands-on research and discovery and how you can use that information to develop what I call action plans with what you learn and how to make a change and how to make a difference. The one thing he used to tell me was that "Research for the sake of research, doesn't move the needle.

Marilyn ([03:56](#)):

You have to learn, you have to do something with your information to move that needle and to cause change." With my undergraduate research in chemistry, I had to do a hands-on research project and he had a series of projects we could choose from. I chose one related to children's health that I thought was interesting at the time. There were children in a certain geographical area of Virginia that had very similar learning disabilities and the Medical College of Virginia was interested in learning more about this or whether there might be some sort of environmental factor coming into play. He recommended that we evaluate trace metals in their blood to see if they were normal and if there was anything strange going on there. I took that on as my undergraduate project and I would say that particular project is really what set me or established the foundation of kind of where my career took off and understanding environmental pollution and its impact on people's

health and how to manage it and make sure that we have healthy materials, healthy buildings for people we learned from that research that there were elevated levels of blood lead in all of the children.

Marilyn ([05:18](#)):

We were able to trace that back to lead paint that was in there and their homes at the time. We were able from that to really develop an action plan, to remove the lead paint from their homes. Following up those children for four years, we were able to show that we reversed their learning disability issues. That really taught me the value of getting knowledge and applying that knowledge for change

Charlie ([05:49](#)):

Great story. Now we know why you got into this and the work you've done and a couple of great nuggets there. I heard Dr. Black, you have to have that action plan, but don't do research just to research, make sure you're going to act on that information. Act on that data that you find and it sounds like you've been doing that ever since. Sustainability, that's what we talk about here on this Green Building Matters Podcast. There's programs like LEED that have been great tools along the way. You've also founded some certifications for materials, furniture and so much more, but how are some of those programs or certifications, how have they helped along the way with the work that you do?

Marilyn ([06:30](#)):

I would say in general I've always been driven to explore, learn and apply the knowledge as we were just discussing for a positive change. I began studying indoor air quality a number of years ago. While I was actually on the faculty at Georgia Tech and through a research program with the Environmental Protection Agency, I was able to learn a lot about what was actually in the indoor environment, in our buildings and how that pollution we were learning about was impacting human health. While we were learning that there were a number of manufacturers who had market concerns about their products making people sick. Some of the early industries were the carpet industry that's based in Dalton, the office furniture industry that was based in Grand Rapids, Michigan, and they were having to remove a lot of products from buildings because the occupants believed that those products were making them sick.

Marilyn ([07:44](#)):

About that time the green building movement was also beginning to start and they were going to have the first meeting of the US Green Building Council. I remember those early discussions back then saying, "If we talk about green, we have to make sure that health is an integral part of being green. If you're going to have a green building it has got to be a healthy building. We've got to make sure that people's health is protected and that they feel comfortable and they're productive when they're in these buildings" and that's how my interest and experience in indoor air quality and the understanding of pollution sources and indoor air kind of came into the green building movement.

Charlie ([08:33](#)):

It makes a lot of sense and certainly there have been great tools all the way, and there's more coming out of the healthy building movement. Is this a healthy building or not is now front and center. It's been growing for many years, but now it's front and center here as we come out of the pandemic. Let's connect the dots a little bit here about your career. Can you tell us a little more after you got your PhD from Georgia and what are some of the organizations you've founded and you've been a part of. Tell us what's keeping you busy today?

Marilyn ([09:01](#)):

I would say after I finished graduate school, I would say that my first job also had a big impact on what I was doing. I ended up right out of graduate school at Wright Patterson Air Force Base in Ohio because my husband was in the Air Force. I ended up with a job there at the Aerospace Medical Laboratories and my very first job was understanding the health issues that our number of our Vietnam Veterans and soldiers were having that was ultimately related to a very bad, very bad pollutant called Dioxin. Most people have heard of Dioxin because it still is one of the most toxic chemical agents that we have identified, as of today that has a very dramatic impact on human health. We determined that Dioxin was a contaminant of the Agent Orange Defoliant that had been sprayed over all of the vegetation in Vietnam. That really hit home with me that you could have a single chemical that was present at quadrillion levels, extremely miniscule levels. Having that exposure makes such a dramatic impact on human health. I realized that we can have these unintentional consequences that dioxin wasn't put into that product, it was a byproduct of the manufacturing. That bled over into where I went from there, understanding all of these emerging technologies, all of these new materials that we're creating, that we're using to design and build buildings and furnished

buildings. What do we know about that? What do we know that we're putting in there? Do we have any sort of hazardous types of chemicals and materials in there that could ultimately produce something like the dioxin issue where we're not intending to create a problem, but we do create a problem. That was a very underlying initiative that I was also involved in that kind of led me through my career of understanding chemicals, exposure, and impact on materials and ultimately human health. Everything I did from then on through my career when I was at the Harvard School of Public Health, onto a startup company called Environmental Science and Technology, Georgia Tech, and then on to creating my own company Air Quality Sciences in GreenGuard was all about studying chemicals, their levels and impact in the materials that we're using and ensuring that we're not adding anything toxic or creating any sort of toxic situation that's going to cause a health problem.

Charlie ([12:14](#)):

Thank you for that background and just the momentum you've had. I've been seeing some of the projects your team is currently working on. Can you give us a glimpse into what you are working on today? What's keeping you busy?

Marilyn ([12:26](#)):

The indoor air quality issue is still very alive and very active in the Greenbuild building movement. There is a lot of activity related to health, making sure that these buildings are not only green from a sustainable standpoint, but also green in terms of being healthy for all. Currently I'm in a situation that really is enabling us to study that further today. I'm working with a not-for-profit research organization of underwriters laboratories, Todd GreenGuard, and we're actually conducting active research on emerging topics, developing data and developing knowledge to help us solve pollution, exposure opportunities, and develop approaches for reducing human health risk. Some of the projects that we are involved with are looking at the impact of vaping on children. We are learning how flame retardants that are used in many of our materials that are going into furniture and other furnishing materials, construction materials, how they can be released into the environment and whether or not they produce exposure to folks and how to remedy that.

Marilyn ([13:46](#)):

We're looking at emissions from 3D printers that have become so prolific in our schools, our homes, and our offices. We have studied that pretty significantly. We know that 3D printers emit aerosols into the air that can be pretty detrimental from a human health standpoint. They produce a lot of what we call ultra fine particles that get into the air as well as chemicals that our children and people can get exposed to. We are taking all of that work, producing the research data, but then we are taking the actions forward into packaging, that information in the form of education or tool kits that we can give to the building folks to apply, to reduce exposure and hopefully reduce health impact from using all of these great things that we're producing.

Charlie ([14:48](#)):

Such important work I can tell you're enthused that there's still work to do so. Thank you for all the work you do. This next question is a humbling one. If you were to look back at what stands out on the highlight reel, what are some of your proudest accomplishments?

Marilyn ([15:06](#)):

I'm a pretty driven person, so I love accomplishments and that's just the way I am. I do think that if I were to look at everything that's been done, I would say initiation of the GreenGuard Certification Program is probably, what I consider one of my proudest achievements after studying the indoor air quality for so many years and understanding, learning, and understanding what was impacting the air quality negatively. I think the establishment of the Green Guard program that allows us to test and qualify products to be low in chemicals has really led to the removal and reduction of numerous toxic chemicals from product formulations and also led to the management of chemical levels and buildings today. We have created really safer living, learning, and working environments for all. I'd say that's my crowning achievement, but I look at all of the research initiatives that we have undertaken and in general, we're really able to take all of that information and create some sort of output and information that can be used by others to make improvements for human health, as well as the environment, because all of these chemicals and activities impact our ecological systems.

Charlie ([16:40](#)):

Thank you for taking us there. Where do you think we're getting it right with materials, healthy materials and air quality, and where do we still have a lot of work to do? Could you give us some cliff notes on that?

Marilyn ([16:53](#)):

We've made a lot of improvements in materials overall. I can look at data and I can see we have 80% to 90% reduction and certain chemicals like benzene formaldehyde. Some of these chemicals that are known to humans are synergies, et cetera. Over the past 20 years, we have really reduced those levels very significantly and there are many others in addition to those that I pointed out. We've come a long way and improved the product formulations to move to safer products. We also have the tendency in some cases to make a replacement for those chemicals and products. Sometimes we're still doing that without doing the preliminary to make sure we don't make the same mistake. In other words, if we're going to replace the toxic chemical, let's make sure we replace it with something benign and evaluate that before we do it. I feel like we can do a little bit better on that side in terms of studying these things before we use them to understand their impact. The other area where we still need to make a lot of improvement, especially on materials, is that we need to have a greater degree of recyclability and reuse among these materials because we have a tremendous amount of waste and that's one area where I see that we can probably continue to make a lot of improvement.

Charlie ([18:36](#)):

Thank you for taking that off script question. You did great with it. Let's look to the future, Dr. Black. What should we be reading up on now? Some I interview talk about Smart buildings and we talk about healthy buildings. We're in the middle of that, but there's so much more. What are you excited about? What's coming down the pike, so to speak, in these green or healthy buildings?

Marilyn ([19:01](#)):

We're moving a lot toward smart buildings. I think that we have a great opportunity there because I see health as being a significant component of a green building. We're now kind of integrating air quality with sound noise, odor lighting, all of those things coming integrated into a package. We now have the ability to monitor all of those types of things. We also have the ability to monitor certain aspects of people's responses while they're in those buildings. I get excited

about an integrated system that is monitoring those parameters and harmonizing it with the occupant responses and optimizing those on both sides for the best outcome. I think we're developing the technology to have all those feedback loops and that we can get them integrated and have them all working together for the management of healthy and productive folks. I see a lot of opportunities there.

Charlie ([20:20](#)):

Let's get it. I love the optimism here. Let's talk a little more about you, a few rapid fire questions. What would you say is your specialty or gift? What are you best at?

Marilyn ([20:31](#)):

I would say my gifts kind of go together and I guess I would call it a little bit of foresight attached to perseverance. One of my gifts is really being able to see emerging issues, things that are on the horizon, all these great things people are talking about, but then I can take a back seat and say, "Well, that sounds great, but look at this potential issue associated with it." My other part of that is I have the perseverance to take it on. I say, "Look, here's this potential emerging issue. Let's take this on and study it and keep on track to really get the answer." I don't give up very easily.

Charlie ([21:17](#)):

Persistence. How about habits? Do you have any good habits or routines or rituals you can share?

Marilyn ([21:24](#)):

I'm big on organization and time and materials. I've always been a working mom, I'm the mother of four children. I've always worked, I've always had a career. I've always learned that priorities, time management are really important. I worked toward managing that, but I also have the ability to be what I call nimble, because as organized as you can be, there are always things that come up that need attention. Besides being organized, I realized that I may have to make a change and something may interfere with that cycle. I can deal with that, and that's not a problem. My ritual is I love to work at night. From about 2:00 AM to 5:00 AM, are my most productive times. My ritual is you use that time to catch up on everything that I did not get done in a normal work day.

Charlie ([22:34](#)):

That's a great hack. It works for you. It's a good routine and thanks for giving us a peek in there because of all the great green building enthusiasts and high performance here. What's what makes it work for you? Thank you for that, Marilyn. Let's talk a little bit more about maybe some adventure, a bucket list, maybe some travel. Maybe you want to write something. I don't know. What are one or two things maybe on your bucket list?

Marilyn ([23:05](#)):

My bucket list is pretty small in general. I try to live my life and fit things in because I realized that tomorrow is never a given thing. You should do what you want to do, make it happen if you can and not put it off. I've been pretty blessed in my life with my wonderful family and career opportunities, but I've learned a lot and I still have one specific thing to do that I haven't quite gotten to and that's to develop a program for young parents. There are a lot of healthy things around healthy this whole area. There's a lot of business in the marketplace. It's really hard to understand and differentiate between what marketing is and what's true and what's not true. One goal to achieve, and I really want to find a program that really helps young parents navigate what I call the science and pollution exposure that helps them make smart decisions on the purchase and use of products for the protection of the health of their family. And that needs to be done in a simple way. We need to filter through all of the big chemical names and all of the Greenville Green labels out there. How many green labels there are and how do you differentiate between all those? What's good and what's bad? It really kind of cuts through all that and comes down with some sort of simplified way of making decisions on these products for people.

Charlie ([24:52](#)):

It's so important. I have three young boys and this summer we'll be rolling over. They're 12, 9 and 7. They all have some birthdays coming up. You're right. While some of these labels are great. You just need someone like you to say, "This is how I would do it if I were you" and then really just have that kind of micro learning, just sharing those tips and just that transfer of knowledge. I was talking to somebody yesterday. I love the phrase they were using is "tribal knowledge." How do we share some of these life best practices? Thank you for letting us know that's on the bucket list. Let's talk about books. Is there a book or two you would recommend to the audience and it doesn't even have to be industry specific?

Marilyn ([25:39](#)):

I am and do read books, although most of the books I read are more on technology and science because that's just the way I am. I would say one of my most recent books that I have thoroughly enjoyed is one called Radium Girls written by Kate Moore. I think at one time it was on the bestseller list. I was always infatuated with Marie Curie and her story from years back who founded radium. This book is really phenomenal because it takes you back to the story of the race. I think they were called the glowing girls, the radium girls, and when radium was discovered it was found that it glowed and it was this phenomenal element that allowed you to do a lot.

Marilyn ([26:41](#)):

One of the first of radium was to paint a watch and gauge dials in world war two so that they can be seen at night and in the dark. They found that to be one of the first big uses of radium and the early part of world war one, they hired mainly women to go into these watch factories, to paint the dials on these watches with radium and the workers at that time would go home or go out, leave work, and they would go home. They would actually glow from the radium on them. They affectionately became known around as "here coming the Glowing Girls. They were very highly thought of because they're dedicating their time during the war and do this painting. They felt like they were heroes and they were all very excited about what they were doing.

Marilyn ([27:40](#)):

A lot of these girls began to get really sick with leukemia, certain types of blood cancers and things like that. The association with the radium use and exposure. A number of these girls took it on their own to raise this issue as being a health hazard and how the radium was impacting their hell. The book goes into the story of how this all evolved and how these radium girls have abrogated themselves and went to the government and tried to make changes to the workplace to protect them from these hazards. In the end, this particular event is really what led to having occupational safety hazards in the workplace today. It's pretty phenomenal to read through the book and understand the history and what it led to.

Charlie ([28:45](#)):

I'm hooked. You're an excellent storyteller by the way, but wow. Definitely going to make sure the link is in the podcasts' show notes. Everyone checked that out. That

is pretty amazing. Two questions as we start to wrap up here, Marilyn, number one, is there any advice you wish you'd have known a little earlier in your career?

Marilyn ([29:07](#)):

I think as I look back, the only advice I think I didn't get that would have been nice to know or observed is that if you do get involved in a new initiative, are you doing something on an emerging issue? That's kind of, co-leading an effort it's hard and don't expect it to be easy. You're going to run all kinds of obstacles. They're going to be personal obstacles, professional obstacles, financial obstacles. If you're going to go down that path, I think knowing that you're going to encounter those and being prepared for them is important. The other part of advice is don't let that stop you because they can be surmounted. There is help out there. If you have the passion for doing what you're doing and what you want to do, you can make it successful.

Charlie ([30:21](#)):

Kind of similar to my closing question here. Let's say there's someone listening right now to this podcast and they're thinking of jumping into the green building or healthy building movement. What additional words of encouragement do you have for them, Dr. Black?

Marilyn ([30:37](#)):

Oh, wow. Well, I think it's a fantastic time to be jumping into that area. I think there is still a lot of innovation opportunities for buildings and making sure we protect the health of our people, because whether we're in our car, our office, our home, our school, we are in a building or enclosed environment, probably 95% of our time and that's probably the main sort of environment that can affect us personally and our health. I think there's a tremendous opportunity. I think there's tremendous innovation yet to be researched and established that can help us manage those sorts of environments to the betterment of personal wellbeing.

Charlie ([31:36](#)):

Excellent. Thank you for the encouragement. I really appreciate you being on the podcast today. Everyone listening, be sure to connect to that, all the links we're going to put in the show notes, and I hope you enjoyed today's podcast.

Marilyn ([31:50](#)):

Thank you very much. I appreciate it. Look forward to meeting you one day.

Charlie ([31:56](#)):

I just want to say thank you to our loyal listeners. One year here on the Green Building Matters Podcast, me and the entire team were stoked and just so glad to continue to listen every Wednesday morning to a new interview with a green building professional here in this industry, or just some pro tips that we want to make sure that you were getting straight from us straight to you.

Charlie ([32:21](#)):

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