EP.129 - Amrie Grammer

Narrator: You're listening to *BioTalk* with Rich Bendis, the only podcast focused on the BioHealth Capital Region. Each episode, we'll talk to leaders in the industry to break down the biggest topics happening today in BioHealth.

Rich Bendis: Hi, this is Rich Bendis, CEO and Founder of BioHealth Innovation, in the BioHealth Capital Region, and also the host for *BioTalk*. We have not had many repeat performers on *BioTalk*, but we have one today for you. She was flashing her *BioTalk* mug, which generally, when we were doing this in person, everybody that was on *BioTalk* got a mug. Unfortunately, since we've done so many remote ones, I owe probably about 100 mugs to people right now [laughs], and now that we can see people in person, I'll personally deliver one when we get the opportunity. But we have one of the leaders in personalized precision medicine in the BioHealth Capital Region, and emerging nationally and internationally. It's Dr. Amrie Grammer, who is the Cofounder of AMPEL BioSolutions, located in Virginia. Amrie, welcome back to *BioTalk*.

0:01:11

Amrie Grammer: Thank you, Rich. I'm drinking my coffee out of my mug right now.

Rich Bendis: Great. Well, hopefully, we will have many other times in the future, as you continue to succeed, to continue to drink out of that mug. I think the listeners are going to be amazed at the progress you've made in the last couple years since we last talked. But some people did not hear you, so let's assume nobody did, and we're going to let you first introduce yourself as well as AMPEL BioSolutions to everybody on this podcast.

Amrie Grammer: Thank you, Rich. I'm excited to be back. I'm calling in from Charlottesville, Virginia, which is the corporate headquarters of AMPEL BioSolutions. I'm a scientist-entrepreneur, a double coup, with a chemistry and a pharmacology degree from UVA. Went to UT Southwestern Medical Center at Dallas for my PhD, did a short postdoc, and was recruited to the NIH to run a lab in the 2000s.

0:02:19 And it truly was the right place at the right time—exciting being there while the Human Genome Project was going on.

Rich Bendis: Basically you're down in Charlottesville, Virginia, and something we might have talked about later in the interview, but why not talk about it now, is that you could be anywhere in the country, and you decided to form AMPEL BioSolutions in Charlottesville. And, great community, and very beautiful down there. But why not Silicon Valley? Why not Boston? Why not Research Triangle? Why are you in Charlottesville, Virginia?

Amrie Grammer: Great question, Rich. I grew up in Northern Virginia, obviously went to UVA, was at the NIH, in your neck of the woods, for almost ten years.

0:03:06 And when myself and my cofounder, Dr. Peter Lipsky, who was the Clinical and Scientific Director of NIAMS at the NIH, were looking for locations, we investigated all of the places that you mentioned, and I insisted that we look at Charlottesville. We ended up here for a number of very important strategic reasons. One is that we built our RNA analytics and machine learning technology for precision medicine from the ground up, and we fully own it. To do that—we'll be 10 years old in July—took quite a bit of money and effort, so we needed to find a synergistic location where we could take the time necessary to do that. And Charlottesville was the place. Just a little interesting fact that I was thinking about the other day—we actually needed a supercomputer to plug into the wall.

0:04:09 And so our original office was at the North Fork UVA Research Park, near the airport. Of course, everybody uses cloud computing now, but 15 years ago, I needed to find supercomputing that we could afford, and an office to go with it. Quite a challenging thing back in the day.

Rich Bendis: I'm sure it is. But I think you're getting ready to celebrate your 10th anniversary with AMPEL BioSolutions, aren't you?

Amrie Grammer: We are—very exciting—on July 13th. And the community not only in Charlottesville, Virginia—I'm a third term Virginia Bio board member; that's how we met, Rich—and the BioHealth Capital Region Forum—all being great resources with mentors, introductions to funding.

0:05:03 And really the key, and something that's underappreciated in our region, is the genomic talent coming out of bachelor's, master's and PhD programs. Often now it's called biomedical engineering and data science. Truly one of the best in the country, and a very high concentration of

talent that wants to stay in this region.

Rich Bendis: The other thing that's interesting is that you are a growing example of bench scientists who want to experiment with entrepreneurism. Talk a little bit about that transition, from actually being at the bench—not that you've left it totally—but also this venture into entrepreneurism that you've had with AMPEL BioSolutions.

Amrie Grammer: When I was at the NIH in the 2000s, when the Human Genome Project was happening, there began to be more and more examples of physician-scientists, scientists starting companies.

0:06:08 I followed that example really for the basic reason that I wanted to live the motto, "Bench to bedside." Fully translate all the information, the genomics, about RNA and DNA, to transform human health. Which was quite the topic of *The Washington Post* and many of the media outlets at the time. I was inspired with my cofounder, Dr. Peter Lipsky, to live that.

Rich Bendis: Generally also as entrepreneurs, sometimes it's a solo entrepreneur going by themself, but with Peter Lipsky, you've had a cofounder and a partner that have stayed together for a number of years. Talk about that relationship a little bit, Amrie.

Amrie Grammer: I'm excited to talk about the over-30-year scientific collaboration and now company collaboration of myself with Dr. Peter Lipsky.

0:07:11 We both—I feel a little weird tooting my own horn here—but are world-class scientists. We published almost 100 peer-reviewed papers in *Nature*, *Science*, *Cell*, et cetera just in the last ten years. Through our relationships as consultants in pharma, our deep relationships in Stanford—really gave us the mentorship that allowed us to transform and become a personalized, precision medicine company.

Rich Bendis: You mentioned *Nature*, and that's a nice lead-in, because a couple months ago, I understand, AMPEL was ranked by *Nature* as one of the top precision medicine companies, with respect to the impact of published science.

0:08:04 There's some pretty interesting names of other companies that you're associated with. They're including but not limited to Foundation

Medicine, Illumina, Tempus, Thermo Fisher, Guardant Health, and Adaptive Technologies. With all of these players, many of them with significant resources, global companies, that you would consider in the same space, how do you differentiate what AMPEL BioSolutions does versus some of these other people that you're listed with?

Amrie Grammer: Very important question. There are several key differences. One is the majority of the companies that you just mentioned specialize in oncology. And the NIH and the NCI really encouraged that field as the first to capitalize on bringing immunotherapies to solve a variety of cancers.

0:09:00 In addition, the majority of those companies are focused on DNA, genetics. I say it's like stud poker; no wild cards except in the circumstance of stem cells, where there's no reason to do a test more than once. AMPEL decided to focus on dynamic RNA, which when DNA opens, when your body gets a signal, whether you're drinking a glass of wine, exercising, taking a different medication—the DNA opens, and RNAs, 20,000 in all, turn up and on like light switches. My brother is a lighting designer, and I like to say it's like looking at the lights on stage at the theatre, a rock concert. You see the combination, which is like the symptoms of our body, but there's somebody, in terms of the light board, or in terms of our cells, that are turning those 20,000 off and on. AMPEL has made the tools that actually group those by drug target, cell function, and pathway, so that we can translate the RNAs that are expressed to the right drug, to the right person, at the right time.

0:10:15

Rich Bendis: And you're saying that this is unique and the others can't do it exactly in the same manner in which you're doing it.

Amrie Grammer: That's correct, and I would extend that. AMPEL is the only entity in the world that has full genome coverage in terms of RNA analytics. And that's our major competitive advantage. We're actually members of the 21st Century Precision Medicine Coalition, located nearby in Arlington, Virginia, where all of the companies you mentioned and more, we collaborate in the noncompetitive space on government policies and other aspects, to all assist each other in truly bringing personalized

precision medicine and transforming human health.

0:11:08

Rich Bendis: That's interesting. There was another program NIST had on cybersecurity where all the people in cybersecurity came together, even though they were competitors, to develop standards, because it was such an important topic. Sounds like the 21st Century Precision Medicine Coalition understands and works in the same way around precision medicine.

Amrie Grammer: Exactly. And you can also think back to the late 1990s and the 2000s, that noncompetitive space collaboration is a way that the Human Genome Project was executed. It took a universe of scientists at every level, from the PhD students all the way to, for example, the director of that program, fellow UVA grad Francis Collins, to truly bring that to fruition.

0:12:03 And a little-known fact—there was a good draft of the human genome in 2000 when I started my lab at the NIH. It was about 90% complete, in the mid part of that decade. But it wasn't until about a year ago that the full complete human genome sequence was published.

Rich Bendis: Wow. I mean, a lot of people around the world may be aware, but there's a lot that aren't aware, the impact that this region has had on DNA and precision medicine that's going to impact all of us in the future. I guess we've been throwing around this term "precision medicine." It means different things to different people. So, it's really an exciting era that we're in right now, but tell us what, in your mind, precision medicine *really* means, and why does it hold so much promise. And then the other thing is, what are the challenges that AMPEL has around precision medicine, and how are you going to overcome them?

0:13:07

Amrie Grammer: Great questions. First of all, AMPEL really emerged out of thinking over time at the NIH, and the inspiration of the Human Genome Project. So we use the word "precision medicine" in the way it was originally coined, which was improving human health through genomics, whether it's DNA that's inherited, or RNA, which is dynamic. That's the reason AMPEL chose RNA, because it's a real-time measure of what's going on in every

cell of your body. So, you have the opportunity to interfere with that with different interventions, everything from smart biologics that are targeted, to old fashioned small molecules, to health foods or nutraceuticals.

0:14:01 So, what are the challenges? The biggest challenge was making the tools to group the RNAs. I mentioned that AMPEL is the only entity in the world—we have over 35 patents filed and pending—that cover 100% of all expressed RNAs. We've reduced that number to the 200 groups that define the universe of the immune system and inflammation. And AMPEL's focus is autoimmune and inflammatory diseases. So we use predictive statistics, also called machine learning, to reduce to the minimal number of the RNA analytic tools, grouped by drug targets, that define each disease. So 200 for the immune system, 32 for lupus, 45 for dermatology. That is our second product. You asked me about the challenge.

0:15:00 In autoimmunity, the reason why there's a real desire for precision medicine is that a lot of drugs are prescribed off-label. Lupus, there are only three FDA-approved drugs. And over 95% of the drugs prescribed are prescribed on a doctor's judgment. Why is that? Because there are multiple subgroups of lupus, and it's trial and error. On average, it takes five years, if ever, to get to a drug regimen that works. Popular culture example—Selena Gomez was very public about her journey with lupus. She was diagnosed before the beginning of a tour, and by the end of the tour, she needed to have a kidney transplant. And she has been recovering very well, but she has spoken very openly about the challenge and the journey of finding the right drug for the right patient at the right time.

0:16:00

Rich Bendis: That's a big task—right drug, right patient, right time. But it has taken over 20 years for the Human Genome Project, which started at NIH, to get to where you are today. An analogy is that 30 years ago, everybody talked about biotechnology. Then we went into cybersecurity. Now everybody's talking about quantum computing. And now we're into precision medicine. But the difficult thing for people to understand is actually how do you get a product out of all of these different things that people *really*

chased wildly to be the leader in, in their state, region, or in the country. And now precision medicine is in that stage now, and it's really coming up with real applications for patients, and real products that address precision medicine. Talk a little bit about the right drug, right patient, right time, and why it has taken 20 years to get to this stage.

Amrie Grammer: Bringing precision medicine tests, products, to the market is the reason that Dr. Peter Lipsky and I founded AMPEL.

0:17:08 We realized that we needed to single-mindedly focus on that to accomplish it in our lifetime. We'll be 10 years old as a company in July, and in July, bringing our first product to market—a blood test for patients with the autoimmune disease lupus, which the awareness month is May. What will that test do? We've listened to doctors, patients, insurance companies, and payers, and in this case, it's a rare circumstance where all of the entities are desiring the same thing—to shorten the time to an effective drug regimen, therefore preventing flares. Which kind of you can think of as a volcano. A volcano, the beginning of it could be happening for years, but people don't notice it until it blows.

0:18:05 So AMPEL's blood test for lupus predicts flares, determines what are the abnormal pathways, cells, functions, and with the clinical validity data from the trials that we're conducting, will provide decision support for drug options that physicians can consider. Similarly, our second product will be a skin test for autoimmune dermatology. And the third product will be a blood test for wellness. That will be a quick turnaround, the opposite side, for people of our age, Rich. The flip side of the record—are you in a low range of inflammation or not?—to be used at an annual physical, and then it would be up to the physician and the patient to dig in, of what looks to be abnormal, and how to treat it.

0:19:00

Rich Bendis: I wish I was your age, Amrie, when you say, "our age." [laughs] I've bypassed you by a few decades, but that's okay.

Amrie Grammer: Only a few! [laughs]

Rich Bendis: Hopefully precision medicine will keep me going for a few more decades,

for sure. But really, when we talk about what's going on, I look at it as convergence. And you really have pharma, bio, vaccines, medical devices—and now what we have is AI, machine learning, quantum computing, NLP technology—it's all converging together. And I would say AMPEL BioSolutions is really one of the best examples within our region of how this convergence is actually coming to play, in actually getting solutions to patients that's going to improve their life. Talk a little bit about that convergence.

Amrie Grammer: Thank you for mentioning that, Rich. And in addition, we really are penetrating internationally.

0:20:00 Dr. Lipsky is in Seoul, Korea, this week, at the international autoimmune meetings in lupus. We're both going to Europe at the end of May. We regularly travel to Boston and California. AMPEL is part of the global precision medicine community, and our focus is autoimmune and inflammatory diseases. Our products will be first in class, not only for dynamic RNA, but also for the diseases. In terms of the region, I'll highlight that there are a few other precision medicine companies that have started to come and join, and I'd like to suggest them as guests on your show—Veracyte, out of California, acquired HalioDx in Richmond. They have a lab there. And Exact Sciences now actually has a facility in Harrisonburg. So I'd say that AMPEL has been the anchor precision medicine company for the region, particularly in Virginia, and we're waving the flag and attracting others now to build the region, in terms of workforce, revenue, and of course jobs, which is very important.

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Rich Bendis: You mentioned Virginia and the support you've gotten. Talk about the kind of support you've received from the different resources within the state or within this region that has enabled you to grow to where you are today.

Amrie Grammer: I'm a UVA grad, so the University of Virginia was very welcoming at all levels, to help support the development of AMPEL BioSolutions, even though we grew the IP ourselves. So, being able to have a location at the Research Park, utilizing the supercomputers, to really partnering with the

Career Center and the growth of our workforce has been very important.

0:22:01 Virginia Bio on a state level; the partnership with your organization, BioHealth Capital Region; the BioHealth Capital Region Innovation Forum, as well as there are a lot of regional organizations that have been mentors and really collaborators in building the biotech community from the ground up. When I started AMPEL BioSolutions in Charlottesville and was planning it 15 years ago, there were really only a handful of companies, probably less than 20, that were a core group. And now, they say that we're over 200 and growing at a very rapid clip. Mentoring as a scientist, now scientist-entrepreneur, is in my blood. It's the way that I was trained, not only at the bench, but other scientist-entrepreneurs that gave freely of their time and advice to mentor me. Now I'm a member of the Laguna CEO Forum that meets once a year; that's the who's who of precision medicine.

0:23:06 Very involved in a number of national groups that I always try to bring back home to the region. And mentor people of all trainings, from MBAs who have a scientific interest, to the youngest in our group. We're hosting an international high school student from overseas, for example, this summer.

Rich Bendis: That's great. To be honest with you, it's very important for entrepreneurs and leaders and CEOs to give back to the community, especially in an emerging field like you're in right now. And, Virginia, which has really over the last years had a dramatic increase in its impact and growth within the BioHealth community. I'm speaking with Dr. Amrie Grammer, who is the cofounder of AMPEL BioSolutions in Charlottesville. She is an example of someone who has been giving back, and congratulations on doing that, Amrie.

0:24:06 Let's talk a little bit more about other people that maybe have influenced you or you've read about, and other scientists globally or nationally that you think have had some impact on this same field. You mentioned to me before that Dr. Leroy Hood, that I had on *BioTalk* a couple weeks ago, who is really one of the most prominent scientists in the world—very influential in creating many biotechnology companies that are household words today—has identified five major healthcare challenges as quality,

aging, chronic diseases, cost, and understanding the genome as it pertains to racial origin. So let's talk a little bit about the relationship between AMPEL and these five major healthcare challenges, and how AMPEL technology is going to help tackle some or all of these challenges, and some of the disease you're specializing in.

0:25:02

Amrie Grammer: Dr. Lee Hood is spot on. And I'll talk about in a minute—Dr. Hood is the example of a scientist-entrepreneur that has been an inspiration for me since the beginning of my training. I'll get back to that in a moment. To directly answer your question, AMPEL's disease focus of autoimmune and inflammatory diseases—lupus, psoriasis, scleroderma, atopic dermatitis, for example—are all chronic diseases that people have to deal with every day, and there aren't great treatments. Or, there are a lot of treatment options, for example in psoriasis, but there's no way to quickly get the right drug to the right person at the right time. That's where AMPEL portfolio of blood and biopsy tests come in. Something that AMPEL has always kept top of mind is making products that will work for the universe of individuals.

0:26:08 And what Dr. Hood mentioned in terms of the challenge of ancestry is top of mind for autoimmune diseases. AMPEL has published a number of studies comparing lupus patients that identify as African American, Hispanic, Asian, or Caucasian, and looking at both DNA genetic differences, as well as those DNA differences that drive dynamic RNAs that could be interfered with, with drugs. I like to make the analogy that, if you inherit something in your DNA that is translated into an RNA and a protein driving your cell, it's like a tsunami; it just keeps coming. And the only way to interfere with it is to block it.

0:27:00 How have we approached this? I mentioned that we reduced the universe of RNA to 200 groups that define the immune system, lupus is 32, and we went to great lengths to validate that the universe of lupus across all ancestries is 32, and therefore all of AMPEL's portfolio of blood and biopsy products, we've worked very hard to work for all people.

Rich Bendis: That's amazing. You mentioned Dr. Lee Hood, but I don't know if I've

asked you before; who were the people that influenced you most to, first of all, get into science, and then become a science entrepreneur? And who would you classify as your mentors today?

Amrie Grammer: I grew up in Loudon County before it was a tech hub, up on Furnace Mountain, right near the Point of Rocks Bridge.

0:28:00 I lived pretty much on a farm, and the natural world was my first laboratory. I was always very interested in the natural world. That really increased when I went to school. I went to elementary school in West Virginia, and I remember in fourth grade we were going around the room—and I spent a lot of time in the public library that was right next to my school, reading. I remember I would sound out words in my head, and often I would say them out loud to my teachers, and of course they sounded totally different than the way I had imagined them. But I probably announced that I wanted to be a microbiologist. I then went through all these other iterations as I was growing up of what I wanted to be. But being an immunologist, becoming a scientist-entrepreneur, is the closest to that. And going back to Dr. Lee Hood as an inspiration, similarly he talks about his experience in Montana, growing up in the natural world, the influence of early teachers, being trained in chemistry, references Linus Pauling being one of his professors.

0:29:15 Linus Pauling was actually a member of Pi Sigma, which is a professional science organization that I belong to. So similarly, also, with Dr. Francis Collins. The basic sciences of chemistry are very important to train the mind to think, and to also not be afraid to ask questions. That's one of the pieces of advice that I give to younger scientists. That truly, not being afraid to fail, asking the hard questions—and that's one of the ways that I see scientific training applying to business—not being afraid to fail, pushing the envelope, seeking out mentors, doing something novel, and being able to find individuals and groups that will not only support your endeavors in an intellectual way, but will support you financially.

0:30:13 And, an interesting thing about AMPEL—we're 10 years old; the first third of our life we supported with grants, the next third with revenue from pharma. We talked a lot about that on my last interview. And then we started raising money. And we've raised $10 million, and we're in a bridge

round right now and have our first institutional investor. All of this is possible because of community, mentorship, and not being afraid to ask the hard questions, and to really pursue the adventure of science and bringing it to reality, which for AMPEL is precision medicine—the right drug, for the right person, at the right time.

Rich Bendis: You mentioned fundraising, and persistence and patience generally pays off.

0:31:02 But right now, it's a challenging climate for people raising money, in the country. For all the entrepreneurs that are listening right now, and those that might be raising money, talk a little bit about your tips for trying to raise capital at this time, when there seems to be people backing off a little bit and waiting for some correction to happen. What differentiates your strategy for raising money, Amrie?

Amrie Grammer: I'll share a little bit about my approach, which is really from mentorship and looking at the data. I'm truly a scientist, and I learn from data. In terms of what is a consistent strategy that works even in hard times, it's finding individuals and groups that truly identify with the mission of your company. You need to find individuals that not only identify with the technology, but identify with the business, and then also straddle the middle.

0:32:07 AMPEL has a very strong advisory group—we're also all investors—that bring all of those approaches to the table. Don't be limited to instruments that are popular at the moment. There's always the most trendy way to raise money, but it may not be right for your company. So, explore all options. And I think the mentorship of local organizations like CvilleBioHub, CBIC in Charlottesville, Venture Central, the annual BioHealth meeting that your organization holds, and Virginia Bio—as well as thinking outside the region. A lot of the inspiration and mentorship that I received in fundraising was really from San Diego groups and San Francisco groups. I think we talked a lot about that on my last visit.

0:33:01

Rich Bendis: Well, it never ends; the job of a cofounder and a leader of a bio company has always got their hand out. But, I think one of the things that benefits

you, though—and it goes back to Dr. Hood again—he said that the possibility of understanding the human genome as capable of catalyzing the biggest revolution in healthcare ever. So the key is, you might be in a sweet spot, so regardless of the challenges in raising capital, if you're in an emerging market that has significant growth potential, it can always attract investors.

Amrie Grammer: I would 100% agree with that. Believe in yourself, and leave no stone unturned. I just wanted to mention briefly a very interesting thing about AMPEL's logo, the four stones on the left. First of all, our logo is green and blue, which in a lot of Native cultures is a sign of health—the sky and the grass or water, and the natural world.

0:34:05 And the four stones—I love art. I'm on the UVA President's Arts Council. Art and science are like the circle. So there's a Native myth, especially the Inuit people in Canada and Alaska, that the god and goddesses of medicine and healing are located within the stones. They're always there, they're hidden, and you need to reveal them in order to really contribute to health.

Rich Bendis: An additional national attention that you've been receiving—some of the news outlets including Bloomberg and NPR have reported that AMPEL BioSolutions is on the cutting edge of harnessing big data and machine learning research—which has really become very topical right now. But people don't know how to grasp it, and manage it, and apply it. Talk about a little bit of how AMPEL's work fits into this context of wellness and personalized precision medicine, which also Dr. Lee Hood believes in tremendously.

0:35:06

Amrie Grammer: Agreed. There are 20,000 genes that can be expressed in all of your cells at any given time. This is trillions of pieces of information. That's why people call it big data, and why AMPEL originally we needed to plug into a supercomputer—now we use either Amazon or Google cloud computing—to be able to very quickly take all of that information, use AMPEL's tools to grouping it by drug and cell target, and to be able to predict what's right for you, Rich. And how do we do that? Really it's

fancy statistics or predictive analytics. People coined the word machine learning or artificial intelligence. It's taking trillions of pieces of information and being able to either look at what's happened in the past and predict what will happen in the future.

0:36:08 Or, unsupervised artificial intelligence and machine learning—that works more like the human brain with layers of neural nets that are able to take trillions of different types of classifications and add that on to all of the things that you're looking at, like the groups of RNAs, to really get to the bottom of truly what are the universe of drug targets, and therefore therapeutics, that will work with the right drug, the right person, at the right time. And to follow up when you were asking about challenges—why is it taking so long?—because even though 92% of the human genome was sequenced in the mid 2000s, it took time to know what those genes really did. And to do that looking at human health, looking at bench to bedside, experiments in the laboratory.

0:37:11 What AMPEL has done is make the tools to translate that information to a product, a blood and biopsy test, that doctors will be able to order just like your cholesterol or any other blood test that you get at your annual physical but will inform decision-making so that it will improve your health. And very importantly, as Dr. Hood talked about—wellness, scientific wellness—I think he talked about his book, just recently—which, all of our groups are working towards in a different way. AMPEL is doing it by predicting low inflammation, which is crucial. Many groups have talked about that inflammation is the root of all disease, and the more that we can do on an everyday basis to reduce inflammation, the healthier we will be, and the longer we will be on this planet.

0:38:07

Rich Bendis: I think we're all for improving health and longevity. And so, potentially this data-driven health can help do that. In closing, let's talk about the future. What do you think the *BioTalk* listeners can expect from this data-driven health that we're in right now, over the next three to five years? But more importantly, it has taken you ten years to get to where you are today. Are we going to be able to get to meaningful outcomes quicker now, since people are understanding better how to manage this data, to

come out with specific outcomes related to rare diseases and chronic diseases that people have today? Talk about your prediction for the future, Amrie.

0:38:53

Amrie Grammer: AMPEL's vision of the future is now that our RNA analytic and predictive machine learning platform have been validated for about 18 months now, we've gone across all disease areas, including oncology; a liquid biopsy approach to lung cancer; infectious disease—predicting those that may have a severe life-threatening outcome to a viral or bacterial infection; as well as across all of cardiology and autoimmune and inflammatory diseases. AMPEL is focused on bringing three products to market, over the next three to five years—a blood test for lupus, a skin biopsy test for autoimmune skin diseases, and a wellness quick-turnaround blood test to predict those with low inflammation. We're working with co-development partners across the other disease areas, and we're in the process of working with pharma partners for out-licensing. In terms of the global future of precision medicine, I think the 21st Century Precision Medicine Coalition and all of its members, we're all working together in a noncompetitive space to bring the translation of genetics, DNA, as well as RNA and genomics, to the everyday bench-to-bedside of a patient experience.

0:40:24 This will start in regions like the Capital Region, with Johns Hopkins, the NIH, other high-density medical centers. I predict in five to seven years, we'll begin to penetrate primary care providers, especially in the arena of scientific wellness.

Rich Bendis: Well, I believe in what you're saying, Amrie, because you delivered on what your goals were years ago. Maybe sometimes it's not a straight path, but entrepreneurs know how to navigate to get through some of those rocky roads or those valleys and the peaks that they may have.

0:41:05 Is there anything that we haven't discussed that you want the *BioTalk* listeners to know, today?

Amrie Grammer: AMPEL BioSolutions is located in Charlottesville, Virginia. About half of our workforce is there. Half is across the country. We're always looking for

smart people that would like to dig into precision medicine, everywhere from business to the C suite to the R&D scientists. We welcome outreach. We're looking for co-development and licensing partners across disease areas, from oncology to infectious disease to autoimmunity. I'd like to share with the listeners that truly, myself as a cofounder, and Dr. Peter Lipsky, are very grateful to the NIH community, the community of Maryland, DC, and Virginia, for mentoring and support at all levels, and we're very much looking forward to growing, and staying in the region, and being part of the community for the future.

0:42:12

Rich Bendis: You're going to continue to be an integral part of the growth of this region, Amrie. By the way, if anybody has an interest in working with you, as a partner, or for the company, how do they get in touch with you?

Amrie Grammer: AMPEL BioSolutions' website, ampelbiosolutions.com. AMPEL also means "light." We bring light to problems. I look forward to speaking to anyone that's interested, both for partnering, co-development, to actually synergizing with the AMPEL workforce. And Rich, thanks so much for your time today.

Rich Bendis: You're welcome, Amrie. We've been with Dr. Amrie Grammer, cofounder of AMPEL BioSolutions, on her repeat visit to *BioTalk*, which will probably not be the last. Thank you very much, Amrie.

0:43:07

Amrie Grammer: Have a great day, Rich.

Narrator: Thanks for listening to *BioTalk*, with Rich Bendis.

End of recording