EP.81 - John Mumm FINAL

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, I'm CEO of BioHealth Innovation, and your host for *BioTalk*, where we interview emerging, existing, and serial entrepreneurs, and other leaders in the BioHealth Capital Region. And in keeping with that tradition, we have an emerging entrepreneur who is very experienced as a scientist and CEO, and also is the cofounder and CEO of Deka Biosciences, John Mumm, joining us today on *BioTalk*. John, welcome to *BioTalk*.

John Mumm: Hey, Rich. Thanks so much for having me. Really appreciate the opportunity.

Rich Bendis: We're looking forward to it because we have a great history here within the region with a number of companies, and I think the listeners are going to be hearing that. So that's probably where we're going to start.

0:01:03 You can basically introduce yourself to the listeners, and then also, go back as far as you'd like in your 24-year history in pharma and bio, and even before that if you'd like. And tell us about why you're in this crazy business right now.

John Mumm: That's for sure. All right, cool. So I'm John Mumm. I am the CEO of Deka Biosciences. This is my third startup. I've spent quite a lot of time in the Bay Area. I was attracted to this area really from a variety of perspectives, both family as well as the opportunity that I saw here to start a company. So for me, I was actually introduced to biotechnology about 25, 26 years ago in my very first freshman dinner in the CEO Talk series at Menlo College. And I'd literally just come back from a run, so no one was sitting around me. And Vaughn Kailian, who is the CEO of COR Therapeutics, came and spoke. You have to understand, I grew up in a very small town in Northern California where the available jobs for me were gas station attendant, or building houses, or working in timber.

0:02:07 And while there's nothing wrong with those, I've actually done all of them, when I heard Vaughn speak, I thought, "This is science fiction. This is where I want to be. This is why I'm in college. This is what I want my life

to be like." I chose biotechnology as a major. I worked full-time through all of my education. So I managed to get a job at Anergen my junior year. Anergen was a company that was working on shutting down the immune response in autoimmune patients. And so, I thought, like a number of others at the time, like Jim Allison and a variety of people that we've probably heard about, that it may be possible to turn the immune system on to destroy tumors. I have a real personal vendetta against cancer. Eight members of my family have died from the disease. So I've seen the spectrum of treatment over 30 years. And it really is amazing that we're in a time where we can talk to the immune system effectively to facilitate control of tumors in a large number of patients.

0:03:09 We want to grow that. But for now, we're in a good place to start. I worked for a few years at Anergen, really, to get a better understanding of what biotechnology was like, and I realized very quickly that to move up in the ranks, I had to have an advanced degree. I was accepted to a master's program at Stanford because I really wanted to understand if I wanted to go to science or medicine. And I worked, also, as a lab tech with Dr. Mark Davis. So Dr. Mark Davis is a very prominent T cell expert as well as a number of other things. Fantastic person. Just an amazing scientist. And in his lab, I worked with Dr. Peter Li. And what I did with Peter, he's a hematologist, and so he was looking very early at the interface between the immune system and tumors. Solid tissue tumors and the immune system. And I built these MHC class 1 tetramers. So it's a technology in Mark's lab.

0:04:00 And the question we were asking with Mario Roederer, who's now at the NIH, was, do cancer patients have immune systems that have seen the tumor? Meaning, has the part of the immunological cascade been activated in an effective way, and do we see the remnants of that? Obviously, the tumor's growing. That's a problem. But was there some point in the past where the immune system was activated? And in all the patients we looked at with these tetramers, the answer was yes. So I took that to mean, "Well, it's not such an issue necessarily of the stimulation, the initial awareness of the immune system of the tumor, but rather something in the tumor that's blocking the capacity of that activated immune system to recognize and destroy the tumor, from function, and persistence, and infiltration. All the things that we know today of how the solid tissue tumor blocks the immune system from coming in. A large

component of that is actually PD-1, PD-L1. And I was kind of on the right track. But I realized in Mark's lab that not only did I love science, and that I didn't want to be a clinician, but that I wanted not to be a basic researcher, but rather someone who built therapeutics.

0:05:08 That's really kind of how my brain works. I wanted to cure my family if I could.

Rich Bendis: How old were you at this time, John?

John Mumm: I was 27 by that point.

Rich Bendis: 27, great. Still early in your career.

John Mumm: Yeah. Young, and dumb, and really not understanding anything.

Rich Bendis: Well, not that dumb because you're thinking about these things when you're 26, 27.

John Mumm: I got so lucky just being around great people and being in great environments. So I decided to go to MD Anderson, where their tagline is, "Bench-to-bedside," and, "Making cancer history." And I believe in that mandate, if you will. I found a position with Dr. Elizabeth Grimm. So Liz had worked with Steve Rosenberg at the NIH developing interleukin 2. And I really felt, as a biochemist, then an immunologist, and then cancer biologist, that cytokines were really that space that we could tap into to make therapies, either to stimulate in a very specific way, or to suppress in a very specific way.

0:06:06 And in Liz's lab, I worked with Dr. Nancy Poindexter. And Nancy had built the system already of a human melanoma tumor and the reactive population of CD8 T cells. So I had this system in a dish, human cells that I could put cytokines into and ask the question, "What are the cytokines that suppress the immune response, and what are the cytokines that activate the immune response?" So, again, remember, this is way before tumor immunology was a thing. No one even knew what I was doing, nor did they care. And what I found was the opposite of what everyone expected. Interleukin 10, which up until that point, was believed to be a predominantly suppressive cytokine, actually activated these tumor-reactive CD8 T cells. Obviously, I thought I did it wrong, and so I did it

again, and again, and again, and the results came out the same way. IL-10 actually activates CD8 T cells that can kill tumors.

0:07:00 And this was the first big discovery in my career, and it set the tone for a lot of the things that I've subsequently done, which is to fly in the face of dogma. Thankfully, we move fast enough in science these days that dogmas really don't have an opportunity to kind of sink their fingers and teeth into scientific thought. But at that time, a large number of folks said that, "This cytokine is a suppressor." And then, those same people treat, say, 3,000 patients, like Schering-Plough did, who had found IL-10, and it wasn't suppressive across the board. No one knew how to address the data. What we've now learned, because we're the inheritors of all this clinical data with cytokines, is that all cytokines have a suppressive function and have an activating function. IL-2 is a great example. IL-2 drives T regs. IL-2 actually activates NK cells and CD8 T cells. That's why we're building all these muteins, is to try and keep certain biologies and get rid of others.

0:08:00 So IL-10 was really that first molecule that uncovered the bimodal functionality and tri- and quatrimodal functionality of cytokines. So to me, both from a scientific perspective, from a therapeutic perspective, this was a region that was rich with discovery and the ability to build multiple therapies if we could really just figure out how to do it.

Rich Bendis: I feel like I'm in class, John.

John Mumm: Yeah, I know, I'm so sorry.

Rich Bendis: No, that's OK. I'm getting educated, and I'm sure the listeners are enjoying listening to that background.

John Mumm: Excellent. I'm glad. So I followed IL-10 to my post-doc. I go to DNAX, which was the think tank of Schering-Plough. It was actually one of the first biotechnology think tanks that had ever been developed on the property of Stanford. And I worked with Dr. Martin Oft. And he hired me for a different program, but I secretly went to the freezers, and got out IL-10, and started doing anti-tumor experiments in mice. I realized that I actually did the whole scientific process backwards.

0:09:01 I started with human cells, found a biology, and then went backwards into mice to figure out exactly all the other pieces that I couldn't tease

apart in the dish. And I found, as a few people had published, that IL-10, in particular the PEGylated IL-10, the half-life-extended cytokine, exerted very potent anti-tumor function in a CD8 T cell specific fashion. Same thing I found with human cells was true in a mouse. So now, we have this kind of linear biology. I post-doc-ed for a year, they hired me as a scientist, I spent four years developing this program. And the reason it took four years is that I was doing it amidst a group of scientists, about 150 scientists, who all believed that IL-10 was a suppressor and who had no belief whatsoever in tumor immune oncology. So you can imagine going against dogma, and pushing the rock up the hill, and all that jazz, it was useful because every time they asked me to do something as a further proof, I had the resources to do it. So I just kept building that mass of knowledge of how to use it, where to use it, who to go into, etc.

0:10:04 And when Schering-Plough and Merck merged, I saw that opportunity to out-license the PEG IL-10. The reason is, at the time, Merck was predominantly a large company of small molecule developers. An antibody was kind of a far reach at the time for them, and a cytokine in something that they didn't care about, immune oncology, which didn't exist, definitely was not going to fly. So Martin and I started a company, Targenics, and we managed to out-license the PEG IL-10, and we actually got our first term sheet for acquisition from MediVentures here in the area. It's the first time I'd been here. I said, "Wow, it's beautiful. There's lots of smart people, there's lots of infrastructure. This is a cool place to go."

Rich Bendis: And for people who don't know, MediVentures used to be MedImmune Ventures, which doesn't exist anymore. But you got one of the early deals. That's great.

John Mumm: Yeah. Well, we got an offer.

Rich Bendis: You got an offer.

John Mumm: Yeah, we didn't take the deal.

Rich Bendis: Ah, OK.

John Mumm: Yeah, because that enticed Peter Van Vlasselaer and Beth Seidenberg from Kleiner Perkins.

0:11:02 So we had an opportunity for acquisition. We chose not to. We had set the price of the company. And Martin and I then formed ARMO Biosciences with Peter. At ARMO, I ran manufacturing. Literally, I had no idea what it was. When Peter said, "John, you're going to run CMC," I literally had to Google CMC because I was thinking critical micelle concentration.

Rich Bendis: Right.

John Mumm: I was in a very different place as to what I was about to embark on. But the reality is, I learned an enormous amount in the next four years about how to produce proteins. In particular, cytokines are profoundly difficult to manufacture. I learned about the clinical component. We published a lot of papers, wrote a lot of IP. Just a truly great experience. And after four years, we had our first billion-dollar term sheet. And I thought, "OK. I have seen everything that I need to see so far at this stage. I want to go back into the field to see what I've missed. Because I've been so myopically focused on the cytokine and this manufacturing.

0:12:04 What have I missed?" And so, I came back to MedImmune…

Rich Bendis: Wait a minute, now. You had that billion-dollar term sheet. Don't leave my listeners hanging. What'd you do with that term sheet on a billion dollars?

John Mumm: Right, so we had ascending term sheets every year that ARMO existed. And what that valuation told the VCs is that there's more gas in the tank. That was four years into ARMO. ARMO went IPO about a year later, and then was acquired by Lilly about six months after that for $1.6 billion, all cash upfront. So that was a nice day.

Rich Bendis: Nice little hit for yourself personally.

John Mumm: I'm not going to complain about it.

Rich Bendis: OK, great. Congratulations.

John Mumm: Thank you, thank you. But we also learned an enormous amount in that interrogation clinically, which I think is quintessentially important in the context of understanding how to use cytokines. So at ARMO, I actually ran manufacturing, as I mentioned, with Cytovance. And at Cytovance, I

met Samantha Conner and John Conner, who, at Deka, are our Vice President of Product Management and COO.

0:13:05 So in context, then, of meeting people and kind of reaching out to likeminded folks who want to build therapies, we had, then, the opportunity with my previous experience to find folks that were really kind of in this way that we built companies here in Maryland, which is very different, to be honest, than how companies are built in the Bay. And I think we'll get into that at a later time. So we wrote 25 process amendments, so we were tuning the car as we were driving down the road at 80 miles an hour. Our first cost of goods was $733 a vial, our last was $26. So we really managed to improve and move forward. We have this acquisition. Prior to that, I go to MedImmune, and at MedImmune, I had a wonderful chance, working with Ronald Herbst and others, to see the co-stimulatory landscape. And what happened is, while the co-stimulatory ideas were truly profound, they failed clinically, and they failed for a number of reasons.

0:4:04 But what I realized there is that cytokines are nature's co-stimulatory molecules. So when I set up Deka, it was to go back into the cytokine space, but to solve all of the problems associated with turning cytokines into therapies, and to really harness that natural biology that I'd worked on for years and years to build a platform of molecules that are for oncology, and for anti-inflammatory disease.

Rich Bendis: What was your role at MedImmune, John? I hate to interrupt, but what job function did you play there?

John Mumm: I was a director in the Immune Oncology Research Division. By virtue of my experience, I worked a lot with Pavel Khrimian, who is a CEO and cofounder here at Deka, really looking out at potential opportunities to evaluate and bring in to MedImmune at the time. And really, when I reached out to Pavel and said, "Hey, I'm a crazy kind of serial entrepreneur. I think that we should start a company," Pavel kind of looked at me for about 30 seconds and said, "OK, let's do it."

0:15:01

Rich Bendis: So that's where science and business come together, right?

John Mumm: Exactly. Exactly.

Rich Bendis: Because he had a role in business development, while you're the scientific side. So that's a good partnership when you're founding a company to have both elements represented.

John Mumm: It's interesting that you say that. So I had the opportunity to participate at MedImmune in these team building exercises that all corporate large groups do. And what I learned was really kind of the metanoia. It was a mental shift from how I had been raised early in my career or had been taught early in my career that every person has to be fantastic at everything. The shift in mentality nowadays is, we all have core strengths that we are super proficient in, and we have things that, frankly, we're really bad at. And instead of trying to put energy into the things that we're naturally bad at, the way to build a team is to bring people that complement you like a puzzle piece. So exactly to your point, Rich, Pavel has huge experience in deals, and reaching out to VCs, and kind of deal structures, etc.

0:16:06 I have the flip side of starting companies, and being on the science side, and manufacturing, and those kind of components. So really, I knew what I lacked, for lack of a better word, I knew how he could complement the team that we were building. And then, bringing Sam and John in, and then Natalia as our protein biochemist extraordinaire, all of those pieces, when you think about building a team, it's all about rounding out the team as a whole by virtue of fitting people together in pieces, and then enabling each other. That's, really, I think one of the more important pieces as well.

Rich Bendis: And I think one of the important things for you is that you had been through this before. So you knew what to do the third time and correct maybe some of the things you might not have done the first and second time.

John Mumm: Yeah, hopefully.

Rich Bendis: Hopefully.

John Mumm: I'll just find other things that I need to correct the next time.

Rich Bendis: It's still a work in process, right?

John Mumm: Exactly.

Rich Bendis: OK. So that really leads us to the forming of Deka then. You guys both left MedImmune, you were both employed at MedImmune.

0:17:03 And this was what year you said, "Let's go start a company"?

John Mumm: 2018. And then, we really started 2019, yeah.

Rich Bendis: Now, let's talk a little bit about Deka then. You came up with this idea. Where did the intellectual property originate from? What was the original concept for the company as to what the long term goals were going to be for it?

John Mumm: We had kind of an original idea of building antibodies, had the capacity to bring together the receptors for cytokines. I understood very quickly that that was really not tenable. What we had to do first was understand if linking two cytokines together would actually be useful. The research piece to potentially someday figuring out how to do biospecific antibodies for cytokine receptors first was what has essentially become Deka's platform. And Deka's platform are these diakine molecules. So dia- is two, and -kine is cytokine.

0:18:01 And really, as I mentioned, Deka's all about solving the problems or challenges associated with making cytokines into therapeutics. And so, first and foremost, they're very hard to manufacture. They're small molecules, you have to fold them, getting high concentrations, getting them to be secreted by mammalian cells, it's super challenging. So what we built was this fusion system in a specific structure that enables us to express a gram per liter or higher titers. Keep in mind, when I was at ARMO, my yield was .001 grams per liter, and that was actually on a good day. So I'm multiple logs better because of an understanding of how to put all of these things together. So that's the first thing, make it consistently manufacturable. We managed to do that. The next is, cytokines work really well at high concentration in tissue. They're not designed to be distributed at high concentration throughout the whole body. That's actually the definition of disease. So if you have rheumatoid arthritis, you have super low levels of TNF and other cytokines in systemic circulation.

0:19:06 That's no good for the general health and wellbeing of the person. Problem that we have with COVID is that we have massive cytokine release syndrome starting in our lungs and spreading through our body.

That's not good. So what you have to figure out is how to enrich the cytokine or cytokines in the tissue. And so, we have figured out how to couple and fuse our cytokines to a targeting system, a VHVL that we can graft CERs into to target those cytokines and enrich them, either on a cell surface or in a tissue. Now, we have targeting. Next thing, as I said, cytokines are small, they have poor PK. So we need to half-life extend. What we've managed to do is build this modular system where we can have a homo- or heterodimeric cytokine on one side, we have our VHVL as our targeting system in the middle, and then on the left side, if you will, we have a monomeric cytokine complementary to the other.

0:20:00 So we have a way to grow the cytokine to about 76 KD or grow the fusion protein to about 76 KD, and we can target the two biologies, the diakine, into tissue or to cells. As I've been alluding to, cytokines work best in concert. We've known this for 30 years. Every time we do an in-vitro model, we put two or three cytokines into the system because that's what's needed to drive out a specific biology. So if we then take a step back and say, "OK, what's the best way to make a therapeutic?" well, the best way to make a therapeutic is to combine the cytokines that have both enhanced potency, and, say, in the case of our lead oncology molecule, we harness IL-10's anti-inflammatory function to tamp down the inflammatory toxicity of IL-2. It's by virtue of working all these years in the cytokine field, we've inadvertently discovered as a collective how these cytokines go together. At Deka, we're the first ones to actually build these fusion proteins as therapies.

0:21:00

Rich Bendis: Is that where your intellectual property is built from, John? Talk a little bit about what is proprietary to you and what you're trying to protect at this time.

John Mumm: I got very lucky in working with a number of IP groups through the years. For whatever reason, I seem to have a brain that's comparatively fertile in coming up with crazy ideas. And I've learned how to write IP. I've learned about un-obviousness, I've learned how to build un-obviousness by actually starting to do experiments that no one else has done. So part of where our IP resides is, first and foremost, in the structure. We have a novel structure. We have the ability to, as I said, compartmentalize, build all these different cytokines so we can nail down composition of matter

and method of use. That all came de novo literally as we started Deka. I had kind of thought about these bifunctional antibodies, and like I said, realized that wouldn't work. And then, we started building these other molecules from scratch to see if they would work. And that's really, I think, for other entrepreneurs, a very important part is, the first amount of money that you raise, whether it's yourself or others, is all about the kind of crazy, big-brain stuff of, "Is this going to work?"

0:22:11 And you try to do that as quickly and economically as possible. Because the money that comes in later is really tactical. So if you can solve specific problems, you then have this niche from an IP perspective that's novel, that no one else has done, that enables you to launch from there as quickly as possible. So the other piece to our composition matter, and our structure, and our muteins that we built for IL-10 that kind of keep certain functions and get rid of others, is then our precision medicine system. So we have dovetailed all of our abilities to select specific patients in the IP that we write with the molecules that we plan to use for that particular indication. And so, as an example, we have a normal non-mutein IL-2 that's detoxified with a high affinity mutein IL-10 that is targeted to EGF receptor for our first molecule.

0:23:04 We can also target it to the VEGF receptor two for two to PDGF, you name it. We can target it anywhere. As our anti-inflammatory platform, we target to, say, CD14, which is on the surface of inflammatory monocytes, MAdCAM, which is in inflamed tissue, or the VEGF receptor, which is in psoriatic tissue on rheumatoid arthritic tissue with an IL-4, a non- glyphosate IL-4, and a low affinity IL-10. So we have this mutein combination, these tweaks on the other cytokines where appropriate, and then they're fused to target to specific tissue, which is a unique sequence in and of itself. And then, as I said, that's all dovetailed with our patient selection strategy.

Rich Bendis: You talk about precision medicine, and that's a term that a lot of people refer to within the whole life science industry. There aren't that many people who have been successful yet in perfecting precision medicine. So do you have any role models of companies that you have seen that you would emulate?

0:24:00 Or are you going to be a first mover and pioneer something that really hasn't been achieved yet?

John Mumm: That's a really good question.

Rich Bendis: That's the second one, John.

John Mumm: Yeah, I know. This is amazing.

Rich Bendis: It's amazing for me. Yeah.

John Mumm: So the folks that actually drove the PD-L1 selection assay at Merck were actually the folks that I used to work with. The reason that's important is, back in 2005, one of my first company meetings at DNAX, the then-CEO, John Curnutte, came in and said, "Look, the FDA has requested of all pharmaceuticals that they start to build precision assay systems, start to think about how to select patients." And John said to use, "Look, you guys, that's your job. You're scientists, you go figure out how to select patients." And I said, "Yes, sir."

0:25:00 And I built an assay system that's predicated on the cells that are most relevant to the cytokine and to the disease. So let me explain what I mean. When I started the discussion of how I came into immune oncology, I said, "We had a tumor system and a T cell population that was reactive to the tumor. Those are CD8 T cells." Just by sheer, what I call stupidipity, just luck, we learned over time that IL-10 has to engage the IL-10 receptor on the CD8 T cells. No other cell needs to have the receptor. Just those cells. And the binding of IL-10 to the receptor has to produce interfering gamma at high level, otherwise there's no anti-tumor function. So we then had the ability to reduce what appears to be a relatively complicated series of events down to a cell and a particular output. What I then did is to screen a number of donors, healthy donors, to understand what the per-set distribution of was high responder, high interfering gamma, medium, or low.

0:26:03 What we then found, clinically, is that people treated with PEG IL-10 who had high gamma after treatment were the ones that had PRs and CRs. They responded well in terms of getting rid of their tumors. People that had intermediate gamma had stable disease, and people that had no gamma had no response. The in-vitro assay system, then, mimicked what we saw clinically. We built that whole assay system again here at Deka, and then because we're doing IL-2 and IL-10, we put IL-2 into the assay. And lo and behold, that assay system gives us very similar percentages of high, medium, and low response that correlate with PR, CR, stable

disease, and progressive disease in people treated with IL-2. The other super cool thing is our fusion protein seems to rescue a number of those people that are, say, low responders to IL-2 but high responders to IL-10.

0:27:00 Because we have the fusion of the two cytokines, we're then capable of rescuing people. So we get up to 50% of donors that are responding to our fusion protein, where we'd only have 20-30% in either IL-2 or IL-10 bucket. And what we then did is next-generation sequencing to understand the genetics behind the response or lack of response, and then we did the same thing for our anti-inflammatory molecules looking at monocytes. The monocyte macrophages are kind of the quintessentially important control or gatekeeper of inflammation. So we have the way to select patients for oncology, and we have the way to select patients for anti-inflammatory disease. Are we going to be pathfinders, if you will, in this process? I would say we already are because part of what I was doing in ARMO is looking at the clinical data from that lens of, "How do I select patients?" And so, now, at Deka, we're able to do that effectively, and we're planning forward in our conversations with the FDA to say, "Look, this is what our data looks like, this is what the previous data looks like. We think we can do this better."

0:28:01

Rich Bendis: Well, it sounds like you're passionate and excited about the things you do on a day-to-day basis, John. There's no question about that.

John Mumm: I'm a little nuts, yeah.

Rich Bendis: And maybe you drive some of your peers a little nuts in their company sometimes because of your passion, but that's OK. You need to have a passionate leader. But this is your third time. I would imagine it's a little different strategy for funding for the company today than what you had to go through the other two times. So what has been your experience with Deka, now, with initial funding needs, startup, and sort of where you are today?

John Mumm: We've raised $3.7 million. A good portion of that is actually me putting my own money in, really from a perspective that I believe for whatever reason in what I'm doing. But also, I'm lucky enough to do so. The real difference is we got a term sheet from a local VC about a year in. It was a

great term sheet. We had some troubles anchoring appropriately to get other folks to come into the syndicate. That's fine.

0:29:00 COVID hit, so things went sideways, not a big deal. But it was a great experience, great term sheet, great valuation. Everything that you'd was you move forward in your career. We then had an opportunity to sell Deka to a local biotech. That was an amazing experience. The team was phenomenal. Everything was fantastic. And it really helped my team understand the crazy nonsense that I tell them about these experiences. Because someone can tell you a story, but out of context of your own personal experience, you don't necessarily pull from that story pieces that are really useful. So working with the local biotech, it was great. We had excellent experience. They're super cool people. But we ultimately decided not to take the offer because what it did for us is to level set how much value we built and how valuable Deka is right now. The next step, then, is to put money in, as I'm doing, to do our Cyanotox study. Because when you think about cytokines, your first concern is, "How toxic are they?" Next, you think about IL-2.

0:30:01 You really think, "How toxic is this molecule" Our data suggests that the combination is verging on magical, so that's really cool, but we have to prove that. So that's that next thing that we're doing. And really, our critical milestones for this year are doing our cino tox study, which we'll do in the next few months. We're lucky enough to have already gotten our cell bank going, we know what our titers are. So all of those things, I recall going and listening to VCs, say, 15 years ago, and they'd say something like, "You should do toxicology. You should have a cell bank. You should have your PK assay." And you kind of nod your head and say, "Yeah, sure. I should. I don't know what you're talking about. OK, fine, these are things I need to write down and learn about later." Well, later for me is now. And so, we have our PK assay being built by MSD. You need to know who to reach out to to craft these types of systems so that they're rock solid. So MSD, on their platform, is building our PK assay. It looks beautiful.

0:31:00 Cytovance, the company I worked with before, is building our cell bank. It looks beautiful. We're working with ex-MedImmune folks as toxicology experts to help us design our cino tox study. One of the most important things, I think, that's crucial for entrepreneurs, and I actually heard this at

one of the BioHealth seminars or programs that you ran, was leverage the network that you don't know you have. And at first, you kind of go, "What the hell does that mean?" Well, what it means is, you reach out to folks, and pretty soon find out that you're not distantly connected, but you're proximally connected to a whole bunch of people that have the experience and expertise to help you out. And nine times out of ten, if you haven't been a complete jerk in your past life, they're totally willing to help you. So that's really the beauty of the environment here is within a day, we had a true expert in toxicology ready to help us out. All of these things are, "You don't know what you don't know until you actually ask a few people questions." And sure enough, right next to them is the person that has your answer. So I think that's kind of critical for us.

0:32:04

Rich Bendis: Well, that's exciting to hear that, John, because a lot of people think that you have to go find the best and brightest, wherever they are around the world. But sometimes, they're right in your backyard, they're your neighbor. What you're sort of telling us is the BioHealth Capital Region in this area has a lot of the expertise needed to grow an emerging, high tech, pioneering biotechnology company based on the cluster that's evolved here over the last 25 years. It's encouraging to hear that, and then one of the things I know is you probably started very humbly with whatever lab you had in the beginning with Deka, but you've also just made a recent transition within this ecosystem to take advantage of another resource here, correct?

John Mumm: Yeah, it's really amazing. So I spent roughly 20 years in biotech in the Bay Area. And then, even when I was down with MD Anderson in Houston, I also worked in biotech there.

0:33:05 So I've always worked full-time throughout my education. It's particularly interesting here. So we needed lab space. Pavel reached out to Angela Graham at Quality Biological and said, "Look, do you have anything?" And Angela said, "Sure. We've got one lab." I walked in, and I saw the two labs, but she said, "We have one lab that you guys can work in." And so, I started rubbing my hands together and saying, "This is perfect. Because for the questions I need to ask, I need a hood, I need an incubator, and I need a refrigerator. I'm good to go." So we quickly jumped in. Literally, we met Valerie on Friday, and Monday, we were already working. And we

grew very quickly in terms of what we needed to do and started to bring in equipment. And I recall we needed to produce protein to run a mouse experiment, and I asked Pavel, "Reach out to Lake Pharma in order to get a quote to see how much it'll cost." And they came back, and they said, "It'll be $80,000."

0:34:00 And Pavel's like, "How are we going to do that?" And I said, "We're going to purchase an incubator, and we're going to produce it ourselves." And Pavel looked at me like I'd grown another head on the spot. He was like, "Whoa. You're nuts, truly nuts." And I go, "No, no, no, this is easy stuff. This is not hard to do." We get the incubator, and two months later, Pavel is the guy that's producing our protein. And we're working with Natalia over there at Phena with Andy in order to purify the protein. In a very short period of time, we made 90 different variants of all of these crazy molecules that I'd been dreaming up. To the extent I'd tell my son, and he goes, "Wow, you're kind of like Tony Stark, dad." And I go, "I'm not sure about that, but that's nice. Thanks. I appreciate that."

Rich Bendis: Sure.

John Mumm: Yeah, that's cool. So the point, then, here in the area, is exactly to your point, there's a very large body of scientists who truly care about what they're doing. And that's partially MedImmune, Astra-Zeneca, I know that's the former Human Genome Sciences.

0:35:02 All of the efforts here in the area are a little different, though, from what we have, say, in the Bay Area, or Boston, or even Texas. In those places, folks are very transactional. They're mercenary, in the sense that they have a skillset, you need their skillset, and they're going to give it to you at a price point that is the best for them and for the shortest duration possible because they want to go to the next, to the next, to the next. Here, it's different. And I think it's a profound difference. And especially as a CEO, it has very much altered the way in which I build companies. Here, people look at their companies as an extension of their family. And their goal is not transactional to the extent that they want to make huge amounts of money. Their goal is to really change people's lives for the better. And I don't know if it's being close to DC and the governmental mindset. I don't know what it is. Or the NCI, NIH. But highly qualified people that, I'll be honest with you, everyone that's working at Deka right now is working for free.

0:36:03 I put money in. It's specifically for the science. But everybody else is here, and we've got other folks coming besides that want to push this forward. They see the value. For whatever reason, I'm crazy enough that they think that there's something that's really interesting, and we're a collection of nice people. Really pleasant to work with people. And that's important. Having been in other places where folks were definitely not nice, but they had an experience and a trajectory that they could make money, you kind of look at the balance, and you say, "Well, I've got three kids I've got to put through college. I need to learn, so I'm going to do this for however long you need to do it." Here, it's different. And I think that's a huge difference, and it's a qualitative difference in how we build companies. And exactly to your point, working with Angela, she saw what we were doing and said, "Sure, I want to put some money in. So she's an investor. And then, as soon as we grew beyond the space requirements for her, we said, "Look, we want to move."

0:37:01 And she said, "That's fine. We get it." She was super happy that we didn't take the MNA offer because she wants to see Deka grow in the area. We reached out to the county, we presented to the county, and they said, "Yeah, you guys sort of talk crazy, but some of it seems to make sense. We've got lab space for you at the incubator in Germantown. Come on in." I've been in a lot of labs. I've been in dinky, stinky labs. This lab here at Germantown is so nice. It's everything that you need for that next level company to move forward. In general, it's just been really phenomenal to work with this mindset that folks have here and build this company so far. Keep in mind, we've been doing it for two years. We already got our first offer for MNA. We already have our first patent that's been granted. We have a whole series of IP that's coming. And we're ready to take that next step to build another company.

Rich Bendis: Well, you've become a poster child for Montgomery County in the BioHealth Capital Region, John, because you're the pied piper that can get everybody to work for you for free. I congratulate you. That's a hell of a job, John.

0:38:00

John Mumm: It's good people. It's good people.

Rich Bendis: And it's good people, and I'm sure all of those people are at a different stage of life where they can afford to do that, but they also have to believe in the vision. They've got a visionary leader, and with something they think can help change lives dramatically in the future. I know that we'll talk again because it's really exciting to talk to you about your vision, how you view the resources and the network that you have within this background here in Maryland and the BioHealth Capital Region. But what do you see as your personal goals? You've been there, you've exited, you've had a great success. You're on your third company right now. What do you want to do personally, and then how does that match what the corporate goals are you've set for the company?

John Mumm: It goes precisely to why we didn't take the offer for MNA. And that was specifically because while I would've made some money, my investors wouldn't have made that much money. While it's not about money, at the end of the day, I want to grow everyone that's in Deka, everyone that's a part of it, everybody that comes into it.

0:39:00 It's all about growing our knowledge, growing our capacity. And so, we're actually writing out an offer letter for our first employee, and the terms of lockup for IP and all of these things were really stringent. And I said, "That's not how we want to do things here at Deka. What we want to do at Deka is treat people and grow them so that they want to stay. But we want to grow them so much that when they leave, they go do something amazing. So we don't want to lock them up for some stupid period of time where they can't extend the value, etc." So it's all about growing us, it's all about building this as a company that people want to work at. And then, make molecules that have the ability to really impact disease in a positive way. That's our DNA."

Rich Bendis: It's a great DNA. I think this is episode 1 in the Deka Bioscience miniseries we're going to create, John.

John Mumm: Great. That sounds good.

Rich Bendis: This has been a lot of fun. I've been educated. I'm going to have to go back and study some textbooks to learn everything that you've just expounded to all of the listeners here, but that's OK.

0:40:05 I think you for your time. We've been with John Mumm, cofounder and CEO of Deka Biosciences, located at the Germantown Incubator in

Montgomery County right now. And we look at this as maybe one of the next MedImmunes to emerge out of our region. John, that wouldn't be a bad success story, would it?

John Mumm: That's not a bad way to go.

Rich Bendis: Thank you very much for being on *BioTalk*, and we look forward to catching up with you as you continue to progress in your career here.

John Mumm: Excellent. Thanks so much, Rich. I really appreciate it.

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

End of recording