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In this episode, Taren Grom, editor-in-chief of PharmaVOICE magazine meets with Rachel King, co-founder and CEO, GlycoMimetics, Inc.

Taren: Rachel, I've been following your career for some time and it's been fascinating to watch. You moved from the consultant arena at Bain and Company to the drug delivery company, ALZA, to several startups including Genetic Therapy, which was sold to Novartis, then to one of the country's leading venture capital firms, New Enterprise Associates, to then the founding of GlycoMimetics. Can you talk us through your amazing journey and why you made some of the career decisions you did?

Rachel: Sure, and thank you. It's fun to look back and see what's happened through all those years. I do feel fortunate, I'd say, to have had opportunities to do work that I've found both meaningful and interesting and at many times fun, and so, I do feel grateful as I look back. It's funny sometimes I think when you look back at the period of years like that, it can seem like it is a past that sort of in retrospect makes sense, although when you're in the midst of it, it's obviously not as clear. But I would say, there are a couple of themes that have guided me over the years. One is that I've really always loved biology. I would say I'm driven by a desire somehow to connect with that in my work although I'm not a scientist. I'm not a physician. But I was one of those kids in high school that had a microscope and a dissecting kit at home. I was a biology geek at that point. I thought I might have gone into science; I've always had a love for that. So that was one theme I would say.

The other is, for whatever reason, an attraction to an entrepreneurial setting. I would say both of those have driven the decisions that I've made. That, and then a desire to work with people that I've found I could learn from. So, just reflecting on a couple of the decisions, a first-grade opportunity was right out of college when I had the chance to go to Bain, which I think gave me a really great foundation, a lot of respect and appreciation for an analytical approach to problem-solving and business. I would also say 'confidence building' because there were a lot of smart people there that were great to work with. I happened to be assigned (at one point during my second year there) to a case team that involved working with the biotechnology that was partnered with one of the Bain clients. And that was really the first time I had a chance to see that there was a way to join these interests. I then went to business school. As you said, I went to ALZA.

Then I had another particularly important decision point, an opportunity when I went to Genetic Therapy, which was a startup company at the time. Now we've had a resurgence, kind of a second wave of gene therapy in recent years, which has been really exciting to see. But GTI was actually the first company that had permission to do gene transfer experiments in humans in the United States some years ago. I joined then as about the 12th employee and was able to be with that company through their PC raises, their going public, their partnering with Sanderson, and eventual sale to Novartis. So, that was really foundational for me, too, to give me a chance to see

what it took to get a company through all of those things. And then from there, into Novartis as you said, into NEA, and starting Glyco. I say each one of those has a particular story, which I will go into if you like. But I think the general themes were a love of biology, an opportunity to work in an entrepreneurial setting, and a chance (to the extent you're able to note it) but a chance to work with really great, great people.

Taren: Hearing your story, it sounds like there are a lot of pieces that perfectly formed this puzzle that led you to found Glyco. Is that a fair assessment?

Rachel: I think in retrospect, yes. Prospectively, it's hard to see it that way, but in retrospect, I would say so. So, by the time I founded Glyco, yes, I had worked at a number of different functions. I had been at a small company; I've been a part of a large pharma company; I'd seen the financial side of things from being both at GTI and at Novartis; and throw in some of the corporate strategy stuff from Bain and from business school. So, by that time, I do feel I had had a good breadth of experience to push me for the founding of Glyco, yes.

Taren: With that love of biology and with the technology that your company uses, which is really a differentiator in the drug development space, you've been in business for 15 years. What is your philosophy for the company and where do you see it heading?

Rachel: I guess starting with your comments on the science. So, when we started the company, the idea was – the vision was that we would be able to use this technology to make a whole new set of targets strikable, and that would be to use the knowledge of the functional carbohydrates, (which are then beginning to be understood through a glycomics consortium that the NH was supporting) to be able to use that information to then make mimetics, which would enable us for the first time, to target those mechanisms. So, that was kind of the technology vision. But then with any technology, you need to ask yourself, "Well, how do you make that relevant? Who cares, right? How do you build a company that has an opportunity to potentially affect patients' lives and in particular, to see if there's a way to do it – if they could be transformational ideally". And so we set out to do that. It's actually been extremely gratifying to see how things have evolved particularly in recent years. It's taken time to get to this point and I think probably longer than any of us would have originally thought it was going to take, but to get to the point where we are now where we've got a phase 3 readout for the sickle cell program coming up. We hope within months, through the Pfizer collaboration that we have.

Then we have another program with breakthrough therapy entering phase 3. So, in sickle cell in particular, I have to say it's been a fascinating journey. We had a technology that enabled us to target a particular mechanism, which was the selectins –this is a family of adhesion molecules – and we ask ourselves, "Where would that be relevant?" This is a critical question for any company, biotech or pharma, where is that going to really make a difference. We looked at a number of criteria; we looked at some understanding of biological mechanism (some animal models); and we identified sickle cell disease, in particular sickle cell crisis as being an area where we thought the science said that the selectins played a critical role and we felt that given the incredible need in that space, if we were successful with developing a drug, that it really would be transformational in the way patients were treated. It was extremely difficult to finance that program. And here is where NEA and our board chairman came in and really supported us in ways that were just phenomenal. We were able to get through some great phase 2 data at the partnership with Pfizer. Just this year at ASH actually, when we were there, it's fascinating to see

how the selectins are accepted now as a target in sickle cell disease. Over the years, there are a number of things that have happened that have followed the original studies and have continued to build that case. But it's just fascinating to see how understanding of a biological target evolved, how a field evolves, and it's been exciting to be part of that. So I feel like what we've contributed to in sickle cell disease is really consistent with what the mission is that we set out to do. Certainly, we're waiting with great anticipation for the phase 3 data, which we're expecting mid-year.

Similarly in AML, we have a vision there of looking mechanistically at a biological mechanism that has not previously been targeted in AML. And it's a very differentiated approach. We believe, as we did in sickle cell, that the basic science in the pre-clinical data really supports that. So, we've been very pleased with the data that we've generated so far - the breakthrough therapy designation that we got last year, and now we're carrying that one forward. So, we'll see if that is also eventually something that people will take for granted as a mechanism in AML. Basically, the idea has been apply the technology, try to find places where we could make a clinical transformation successful, and drive the programs from there.

Taren: That is exciting and congratulations to you and your team for moving these programs forward. My next question is around the partnership – so, do you see partnership as your strategy going forward, or do you see the company being able to move maybe your next program forward by itself?

Rachel: Well, I think partnership is always part of a strategic context for a company, right? I mean it's one of the tools that you have in developing the programs and building your company. When we were at the time of looking at partnering our sickle cell drug, we were at a very different stage of the company's life and we were still private. Actually, it was really a challenging time. We're in the phase 2 study and we were short on cash. We were facing a decision where we felt we could either try to partner with a sickle cell program, bring in some cash, expand what we were doing in other areas; or pare down to a very, very small internal headcount and try to get over the line in sickle cell disease, see if we could make the money last and get there – which I wasn't sure if we could – but drop everything else. So, we decided strategically that we wanted to continue to build a company that was not just sickle cell and we really felt that we needed the cash that a partnership could bring. We felt we had more value that we could create across a broader pipeline so, we decided to partner the sickle cell drug that was in phase 2 (so pre-phase 2 data, all we had was phase 1 data) so, we had a good safety profile so far and some really strong pre-clinical data. We took it out and we ended up with multiple companies interested and multiple term sheets but decided that the deal with Pfizer really was the best for the company. That has turned out to be a really excellent deal - because it was done at the time that it was done and with the company at the stage where we have a royalty-based deal (not a deal where we have market participation). And again, it was a good deal for us at the time.

Now, we're in a different situation with our second program, the one that's just entering phase 3. We now are well-financed to get that over the phase 3 line ourselves. We've also got a number of collaborative consortia in place now with the National Cancer Institute here and with another group in Europe because the KOL interest has been so high. So, now we've got a great, comprehensive development program for that already in place and financed. So, it's a very different situation to contemplate partnering in that setting. We don't need to partner that program. I think if we were to partner, it would be very different terms than we did for Pfizer and

sickle cell. I think it's more likely that we might partner something that's at an earlier stage. We've got a lot of really interesting earlier stage programs that could potentially be partnerable, and now maybe enough credibility around the technology that maybe we could get an early stage partnership. So I think we view it differently. It's not a financing vehicle for us now as it was in the earlier days. It would be much more strategic. We were in a different position that gives us more flexibility as we think about what we would want to get out of that.

Taren: It's a fascinating story and I do agree; I think that when you look at the different stages of the development of the technology and the different decisions you had to make, there had to be some sleepless night there. Let's face it.

Rachel: Oh my gosh, yes. I think about the company and sometimes tell the story. If you look at the history of the company from the outside – which everybody does, right – as we look at other companies, other people's companies, it could look like a straight path. You know you got the VC money, the partnership, the IPO, you know the extension of the pipeline, etc, etc. But it was and it's been an incredible roller coaster, that's the truth. At many turns there were many, many places where things could have gone awry and things could have worked out really, really differently. So, yes, there were certainly some sleepless nights.

Taren: Well, you know it then begs a question: as one of the few CEOs in the biotech world, how do you celebrate those successes?

Rachel: Within the company, we'll have company meetings. We'll have company gatherings where we highlight successes. I have to say, I personally find that when I get to a milestone where like, for example, when we got the breakthrough therapy designation, we went from the breakthrough therapy designation immediately to financing. So, it was a great success. And then we spent an exhausting few days of trying to get a financing done, which was done and which was successful. Then we caught our breath and said, "Okay, phew. Great job on both of those." I won't say we have big bashes – you know we don't do that. I think we were more quiet celebrators because I think we recognize that getting an accomplishment opens the door to more opportunity and still a lot to be done so, it's a short-lived celebration.

Taren: That's a shame, but I understand it and I don't mean necessarily in terms of big bashes, but you know gauging success to yourself and gauging the success of the company – it's important to recognize those milestones.

Rachel: Absolutely. We try to engage and communicate and celebrate for our whole team here and recognize the contributions that everyone's made. Maybe I want to tell a story and then I speak about the core values of the company. One of the times that we had big challenges was around the time the company tried to go public. It was in the end of 2013 and the markets had opened up. We got our sickle cell data (phase 2 data) in the spring. We had to go through some Pfizer governance issues to ensure they were going to go forward. Then based on that, we filed our S1 that we rushed to try to get the company public. And we end up going on our roadshow in I think early November of 2013, just at the time that for the first time that year, the market was turning south. We were heading in to try to price our deal when for the first time that year, the BTK started to trade down so, we had to pull the IPO. We were the first of probably 7 or 8 companies that had to pull our IPO at the end of the year and it was really tough. We had gone

through all the work; we actually had gone on the road show so, it was public that we were out there.

So I came back to the company and had to have the company meeting where we said, “You know, we tried and we didn’t get out”, and we were just trying to figure out what our alternatives were going to be. Then at the end of that year, we had the presentation at ASH (we actually were chosen for Best of ASH for our phase 2 data) and we had an end-of-phase 2 meeting with the FDA. We circled back. We decided there during December to circle back to the investors – some of the people we’ve seen on the IPO – to try to tell them, “there’s new news. We got Best of ASH. We got to the end of phase 2. It’s great data and we want you to reconsider”, basically. The bankers had told us that it was unorthodox but they said, “Sure, you can do it. You can call them directly”, which we did. Then in the first week of January, the arrangement was the bankers would circle back to them. If we got an anchor order, then we’d come to New York and we’d market for a couple of days by phone, and we’d try to get the IPO done before JP Morgan, which was our goal because then we’d be ahead of the pack for the year. And so, we did get an anchor order; we got the call from the bankers. We went to New York and were able to get the IPO done.

So, it was kind of pulling a rabbit out of a hat, and I think speaks to one of the core values of the company, which is perseverance. We went through an exercise here, actually some years ago where we asked a group of people at the company – I was not on the team myself but I asked a group of people to see if they could articulate for the company what are our core values here, as a matter of both description and aspiration. What do we think our values are, and what we also aspire to live. They came up with four of them. One of them is perseverance. Another one is passion and integrity and teamwork. I value the words they came up with but I also really value that way that they describe them (that’s up on our website) but that’s a story as a way of sort of giving insight into how we work and how I hope we feel around the company as we do these very difficult things.

Taren: Rachel, thank you so much for sharing that fascinating story. I think it demonstrates that biotech is not for the faint of heart.

Rachel: That’s for sure.

Taren: You really do have to have perseverance and you have to have the teamwork of everybody involved. I’d like to switch tactics just for a second and talk a little bit about your experience as chair of BIO.

Rachel: Sure. I just think BIO was a fabulous organization. I mean I can’t say enough great things about it. It’s a place where colleagues gather not only to advocate for policy that matters, I think for the whole industry but also those of us who are really involved I think find it a great community to be a part of. And I think Jim Greenwood has been a wonderful leader for the organization in the years that he’s been there. I think BIO is really in an interesting way, uniquely positioned to speak to matters of innovation that apply not only to us but also to the big pharma companies. So I think there’s a lot of interest in engagement from the broader policy world in biotechnology where I think people really recognize and appreciate the truly transformational things that our companies are trying to do, an impact that if they’re successful effect that they’ll have on patients.

As you know, I've worked on the pharma side of things, too, when I was at Novartis and actually for a number of years ran the Washington office for Novartis. So I feel also very sympathetic and supportive to what the pharma companies are doing. I think pharma companies also at their core, are striving to be innovative and to make difference in people's lives. But I think on the biotech side, because we're so strapped for cash because we're so, so lean, we have to be entrepreneurial. I think we can really tell the innovation story in a way that's clear and that really resonates with people. I have just loved being a part of that and I believe very strongly in what BIO was trying to do. And the chance to be in the leadership there was great. I was the board chair of the emerging company section, which is one of the kind of divisions of the board there, and then eventually became chair of the full board. I still serve on the executive committee there and I really enjoy it now under John Maraganore's leadership from Alnylam. It's been a great experience. The issues that BIO addresses I think – well, there may be individual specific pieces of legislation in a given time, and the politics of a given moment might change or have a particular focus. I think that some of the themes have been consistent over the years and also even legislation when it does get passed, often takes years.

So I was chair for two years. But the things that I was working on weren't only limited to those two years. For example, at that time, we were working on the early years of what became the 21st Century Cures Act, an important piece of legislation that was bipartisan that passed, which I think has laid the foundation for some important support of the industry. We had it due for renegotiation there. We always have issues around capital formation – how to create an environment where companies can more easily finance. Also at that time, we're really beginning to focus on messaging around the value story that biotech brings. So I get the kind of policy issues that go beyond any one chair's term, but I think really underlie what's been the approach to BIO over many years to try to support innovation in the industry.

Taren: It's exciting stuff.

Rachel: It's really a team effort. The BIO staff is wonderful. As I said, I think Jim Greenwood's leadership has been strong. The board members, which interestingly contribute or could consist not only of smaller companies – I would say maybe 90% of BIO's membership are companies that are considered emerging companies, pre-revenue companies- that's our industry – pre-revenue companies that have less than 500 employees. Many venture-funded or early stage public companies – that's the bulk of biotech. And then beyond that though, we do have membership from the big pharma companies that also have really important things to contribute as they sit around the table and exposed some of the earlier biotech companies to some of the issues that we'll need to worry about, around reimbursement, for example. It's a great industry partnership as it were to really try to get policies that support innovation. So, yeah, I can't say enough great things about BIO.

Taren: And with those emerging companies, I would imagine you are seeing some of the most cutting-edge technologies and some of the most innovative thinking in the industry.

Rachel: Oh, it's wonderful to meet the other CEOs at the board meetings and hear what they're dealing with. It's a great opportunity to network and to share experiences that we have and to share advice and stories – that's great. And from the perspective that you just mentioned, in terms of the technologies that are out there, it's fascinating to hear. One of the things that's really

hot right now, of course, is genome editing. BIO does have a genome editing working group as an example and members of the board who are from that segment. I think we're well-positioned to hear about those technologies and hopefully to be thinking proactively about what policies are going to need to be in place to responsibly develop them.

Taren: Exactly. You also served on a number of other boards including Novavax and the University of Maryland's Biopark, where I would again imagine you're exposed to a number of different cutting edge technologies and innovations. We know from the statistics out there that women have a difficult time securing board positions. How did you find your seat on the board?

Rachel: So, in both of those cases, well I was approached by people that I knew – and I think that speaks to the importance of networking. Each of those are different, of course. Each does really exciting for the respective things that they're doing. Novavax are a really exciting vaccine company here in Maryland, and then the University of Maryland Biopark is a really exciting organization that's developing a biotech center as it were, series of buildings in a biotech center in a part of Baltimore that you know has had some tough economic times. I think it's really helping to transform the neighborhood. So, very different. I have also been approached over the years by headhunters, by different ways of networking I guess, but in those specific examples it's been people that I knew; so, I think that speaks to the importance of people really continuing to build their professional networks as their careers develop.

Taren: Sure. A strategic relationship building – that can be the cornerstone of this kind of experience.

Rachel: Yes. And not just such a strategic- I mean strategic relationship building – I think sounds very planned out. It's hard to plan those things out. I would say what's helpful is getting to know people that you respect and admire, and continuing to build relationships with those people over the years. And eventually I think ultimately that's what bears that kind of fruit.

Taren: Sure. It's that nurturing and keeping that network alive as you move across different sectors and across different industries as well as companies. What are some of the lessons you learned along the way that might benefit other women who aspire to reach the 'sea suites'?

Rachel: That's a really hard question actually, because I think it speaks to so many things. I think a lot of people say to follow your passion and I feel that's a hard thing to actually do in life because I think passions emerge or a sense of vocation I think emerges (at least that's been my experience) is not... I think for some people, it may be that one decides early in life, "I want to do a certain thing", and then there's this path to go after that. If you want to be a physician for example, it is a path, a long path you need to follow. I would say, for much of my life, I had the desire that I would be able to run some kind of entrepreneurial company. I have wanted to do that but I think it's a series of really small steps. I guess if you can follow what you enjoy, fundamentally if you're able to follow what you enjoy, that's number one. Do it in a way that gauges you as much as you possibly can with the best possible people that you can, because it's really hard to know that a particular opportunity is going to lead to a particular another opportunity. What has been my experience is through people that I've known next opportunities have come about.

We were just talking about this a moment ago with respect to boards; it's how you can connect yourself and how you can engage with over the course of your career with the best possible people who can teach you. That's one thing. I would say another is to build as you're able, expertise of some kind (and there's functional expertise of some kind) complemented by some experience of breadth so, that sounds like a contradiction. I came up to the business side of things. Other people might come up through research side or clinical development or whatever; so, you have a functional expertise. In my case I started doing licensing and business development but then was able to kind of broaden that through other experiences so, that eventually, I was able to have to be able to run a company that has a diverse set of functions.

So I would say that's another thing – try to build your functional experience as well as some kind of breadth. I would also say be willing to take some risks – although risk is another one that's difficult to gauge. You know, at one point I was at Genetic Therapy and I hired somebody who came to the company from a major pharma company. I think she's coming from Glaxo before they merged with SmithKline. And so, she came from Glaxo and took a job with us and told me that some of her friends were saying, "Why are you taking such a risky step", you know, "Go do that." But some months later, Glaxo SmithKline merged and as she told the story, if there were 10 people in one department in one company and 10 in the other department, the new company was going to have 15, not 20. Everybody had to reapply for their old jobs. So, you may think you're in an unriskey situation for example, or stable situation but you may actually not be. So, perception of risk is complex to gauge, but I think to take something that sometimes you might feel is a risk I think is reasonable.

The other thing I would throw in here is I'm married and have children. I was fortunate enough for five years, when my kids were young, to work for 4 days a week and I was able to negotiate that with my boss. That gave me that extra day at home, which really helped at that stage of life. So, there's also an element of balance that that somehow can be worked in because you can't do everything at once. But over the course of many years perhaps, you can do a lot. So, those are some thoughts.

Taren: Those are excellent thoughts, and I think you just touched on something very important is that work-life balance. We hear that so often when we talk to women CEOs. How do you maintain that? How do you achieve it? And I think, it's kudos to you for having the gumption to go to your boss and negotiate that. I don't know of another woman that actually speaks up for those kinds of things so that it allows them to move their career forward at the same time as to have a family.

Rachel: Yeah and I think you can't do that if you're going in and taking a brand new job and nobody knows who you are. That's the other thing, which speaks to relationships – if somebody is in a job and has demonstrated capabilities, then you know that the organization is maybe more willing to accommodate that because I think companies recognize more and more how important it is to have the right people and how valuable it is to have the right people and help or just to keep some if you can. So I do feel maybe now, more so than when I was earlier in my career, perhaps organizations are willing to do that. I'm really grateful that my boss at the time (who is the board chair of our company now) was willing to give me the flexibility. That was really important. It was really important to be able to ask for that. And I think as organization, we have to find a balance between driving to achieve organizational goals and hoping that we can have ways that people can have meaningful outside-of-work lives because it's not sustainable to be

running full throttle at work all the time. It's just not. So I hope as organizations, we can also find ways to at least be open to helping people with that balance. It's tough.

Taren: It definitely is tough and we're seeing that pendulum swing. We're looking at how millennials are changing the workforce and how that balance needs to be between, as you call them, 'the seasoned professionals' and the 'millennials' to come in with a different viewpoint as to what work means.

Rachel: Sure. I mean, I think that's a great question. What is the purpose of work, right? And what is the meaning of work? I think a lot of people are taking a perspective now that if we're able to think of work not only as a way of providing financial support to our families and ourselves but also as something that provides meaning, right? And if we're able to think about work more broadly, then we also ask more of it. I think it's good that as a society, we're asking more of it in terms of asking for it to be meaningful to us as well as just a way of paying the bills. I think that's important.

Taren: Right. And having leaders like yourself who act as role models.

Rachel: Well, we try.

Taren: Well, that's a step in the right direction, right? Finally, I think we'll end with this question: is there one piece of advice that you would give to your younger self?

Rachel: I might advise myself not to be so stressed out at certain times of my life. Maybe to incorporate a little bit more of those things that would have brought me to less stress. Enjoy things a bit and recognize – I try to do this now – to reflect on the good that we have in the moment because I think that we're striving to accomplish things in our companies that take a long time, lots of money, in a long time. So I think you can engage with your career – always thinking about something that's far off, that in a few years we'll get to. I think it's important to recognize that in the moment what we have in terms of the value of the work that we're doing and the colleagues that we have... My husband who often does, he made a comment recently that I think was helpful in this regard – I was talking about something that's many years off. I said, "I hope it helps, it works out." And he said, "Why aren't you thinking about everything that's happened at the company so far, in the sense of the way we've built the companies, the things that we've accomplished so far, the community that we have at work, the meaningful work that we're doing", he said, "You know, it seems to me like things already have worked out pretty well. Not that we're finished. I don't think we're finished but I do feel a real sense of gratitude for what we have so far". And I think, if I were to ask or if I were to give advice to my younger self as you said, I think I would say, "Appreciate the journey as much as the arrival".

Taren: Perfect. I can't thank you enough for being so open and transparent and for sharing your story with us.

Rachel: Thanks for inviting me. I really appreciate being your guest for the podcast.



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