

BiB SF PM Panel Script

Shantenu: I really appreciate everyone taking the time. My name is Shantenu and I help run Bits in Bio (BiB) in SF. For those of you who don't know, BiB is a community focused on bringing together folks that want to use software in Science to accelerate discovery, development. BiB is really focused on helping people solve the world's harvest problems. We have been doing community events in SF and 12 cities around the world. Plus we have an online slack channel and a newsletter. If you are interested in using software in science – whether you are a technologist who is bio-curious, a biologist who is technology-curious, or if you are bilingual – we'd love to have you and help you find your people in the community.

Today we are doing a really cool panel around Product. We have a set of esteemed panels here to answer your question. I will hand it over to Vega.

Vega: Thank You. Welcome everybody to the Benchling headquarters. I want to say a quick thank you to our sponsors [Benchling].

I'd like to introduce our panelists -

- Grace who is currently the VP of Product and marketing at Tierra Biosciences. She has a phd in medical generatics and a long history of working life sciences. Most notably GT has led product teams at Synthego, Natera, and StemCell Technologies.
- Jack is currently a senior product manager at Resilience and was previously a PM at a biotech software company. He has a background in biochemical engineering and has previously worked as a bench scientist before transitioning into a PM role.
- Mace is currently a startup advisor and consultant. She was previously head of product at Kinsube and before that she was product manager at Zymergen. Mace has experience working at the bench as well and has a PHD in genetics from Stanford.
- Masaki is head of product at Invert. He has previously worked at Culture BioScience and Genentech. Masakai has a long history of working as an engineer in synthetic biology. He transitioned into product from a role as a fermentation engineer.

What led you to the product management path? And what qualifications does a PM in life sciences need?

Vega: The way this will work is that we have four broad questions and then will open it up for questions from the audience.

Our first prompt (that we get a lot), especially in the BIB #product channel is, “how to become a product manager, especially in the life sciences”. This is about what led you to the PM path and what qualification you need to become a PM.

Grace, you've had an interesting journey into your current role. You did extensive lab research as a grad student. Your first role was business development at sales at Precision Nanosystems. How did you transition to product management?

Grace: I didn't, the board dictated I become a PM. We [Precision nanosystems] had secured a series A round and we were going through a reorg and people were getting new role definitions. From a more organic space I was already doing PM once we hired sales, VP of sales, field application scientists. I was able to move away from a role that was completely externally facing. I was pretty fortunate that we had 5am in the telegraph tell us ‘we want to model you more like the bay area’. I had no idea what product management was when I was given the title. I asked one of the founders if my job would change and the answer was no. I continued to stay simply because it was a perfect mix of science, commercial, and seeing what scientists do with a product. I continued in the role as I applied for other roles.

Vega: Masaki, same question to you except you had a different journey than grace. You went from an engineering role to product management Can you tell us about your journey and specifically right now you do software product management. Tell about how that is different (or similar) to traditional biotech product management.

Masaki: I similarly stumbled into product management. I came from Genentech and had never actually heard of product management at all. When I moved into a startup – Culture bioSciences – I was working as a project engineer helping translate our customer's needs into the work we were doing in our labs. Eventually I burned out in the lab and wanted to continue to participate in the startup life. I realized I was already translating user requirements into the software and what we needed to build and the types of services we needed to provide. I straddled three realms of product management from that opportunity. I am very thankful to the faith that the founders had in me to take on that role. Since then I have worked in Product at Strateos and now Invert. In software product management it tends to be more understanding what the users want to build and buy. It is more of an external software type role. We are continually learning and doing testing, seeing product usage, talking to the users, and making sure they enjoy the product.

Vega: Mace, one interesting thing that comes up a lot is that the product manager is “the mini CEO of the product”. I have mixed feelings about that description. Mace is in a great position because she has been head of product at a startup and she has been a product manager at a big company like Zymogen. Could you tell us about what your trajectory was? How different was it going from a big company to a smaller company?

Mace: What Grace and Masakai shared was also my experience. No one starts going into product management directly. Everyone falls into it. Usually it is your second or third role. How does it look different from a startup or larger company? Product is a weird function – one of the

challenges is that the role is figuring out what the needs of the organization are. I've been in internal product management functions and external product management functions. It is really important that the PM function goes at the function of the organization and fills the gaps that the organization needs. At my last startup (series A) I was in the digital health space. One of the things that was critical was regulatory. Even though at a different company regulatory is not necessarily part of PM, in my case a lot of the role was regulatory and clinical operations because that is what we needed to do to get our product onto the market. The difference between products at a large organization versus a small organization – I've been in a small organization where our engineering team was three people. In that scenario you don't need a super formal process – you just need to know what to build now versus later. When I was at a larger, established company like zymergen I was the PM for 10-20 engineers and data scientists. There I really needed to have really formal processes and quarterly roadmap processes so that you could make sure you were building the right things for the organization.

Vega: thank you – that matches my experience as well going from startups to bigger companies. Jack, you are on the list as well. You have worked at two unique roles – first at a biotech software company and now at a CDMO. First tell us about your journey. And Because you are my friend I will put you on the spot with controversial questions – 'do life sciences PM need a life science background - does it help'?

Jack: A couple questions there. I originally was doing solutions engineering at a software company. I had two great people in my company who felt that I could make a big impact in our product team. So I like to say that they pushed me into that. I didn't necessarily join willingly. But I did end up really enjoying it and feel like it made a big impact. I think that is a similar situation to what we have heard – products find you sometimes, or you don't necessarily walk straight words, and just happen upon it. I didn't know what product was even in the early days of that small company, because product design, solutions, and some of the business was under one person. So it was really hard to differentiate how those things are separate. As we grew, I grew into solutions and moved over to product. At a big company it is different – you usually have identified you want a product type function and it is reflected in your approach to how you want to do business. You want to treat things as products, or you already have a product you want to manage. Growth or development in that role is more – you are coming to know what you are going to do and you have a sense and experience from the past for where you are taking the role going forward. The company I am now has grown thousands of people more than when I started so there can be a lot of change that happens. To answer the second question – no, I don't think people need a biology background. I think as Shantenu said, being bio curious is really helpful. I think there is an element of you wanting to have mastery over mimicry. YOU don't want to mimic what scientists are saying – you want to master and understand what their needs are. From the traditional SaaS or big tech worlds the background you bring does not matter, but you have to have an understanding of the science when you come to science because the workflows are more complex. They are also more immature from the digital space. If you don't have a bias for action or understanding of where science needs to go you are going to really be a PM who listens to people and literally implements what they want. Oftentimes that is the mimicry. You need to demonstrate mastery, a deep understanding of the systemic problems – the reproducibility crisis in science is talked about a lot. If you directly listen to

scientists you are never really going to dig down to that unless you have a bio background and understand that is an issue that people experienced today.

In brief no, you don't need it but it is helpful. If you don't have it, take that skill gap very seriously and seek mechanistic understanding.

How much of your role is internal vs. external?

Vega: Our next theme is about the product management role and building in biotech. In my experience product managers tend to have a wide variety of job descriptions as to what is required of them. Often you'll see this division of internal versus external product management in biotech. The next question is about how much of your role is internal versus external and how does it vary based on the size of the company and product type. Mace, I'd like to start with you first – what was your experience like in your past PM roles – how much external PMM-like duties versus internal product management did you do?

Mace: I mostly did external product management. Zymergen was all internal product management. It is actually an interesting trend in complex industries – like biotech where companies have a complex platform they are building towards. I know platforms are not as hot for VCs, but there are a lot of biotechs that have very complex platforms. It is super common to see biotech companies with an extensive platform that has many PMs supporting those platforms on the external side. A challenge on the internal side is that it is easy to get feedback, but hard to get direct feedback. If you work on an internal tool everyone has to use the toolset build regardless if the tool works well or not. In an external PM the clearest feedback you can get is “No I'm not going to buy your product. It does not meet my business needs.” That is a clear distinction [between internal and external PM]. There are other challenges on the external side where you can't be that honest with your users. There is always an aspect of selling – you always have to sell the product you are working on – which is close to the PMM angle. There are pros and cons to both. Externally it is harder to get direct feedback. Also it is easier to justify the value of the PM function by saying “we shipped this product and it led to this much revenue for our customers.”

Vega: Same question to Jack. To reiterate we are asking what level of multitasking do you do in your role? How much if it is internal facing versus external?

Jack: My current role is purely internal. I would not call that marketing – I would call it organizational change management. If you are onboarding a new tool you want to impress upon the business the importance of adoption and use, especially if the tool is not already established. The product I am working on now has been canceled so I now work on an external product. But I'm fortunate that the other product manager we have is really great on the marketing and external relationship side. This allows me to focus on the internal side. My marketing skills are not actively in use for products I work on. I do talk with our marketing team but more to be the PM type role to bridge a gap of knowledge or synthesizing and helping

people understand how technology, business, and marketing relate. So I'm playing second fiddle to our marketing team and not really directly involved with them.

Vega: Same question to Masaki. You are currently the head of product at Invert. Which requires some level of external communication. How much of that multitasking exists in your role? Especially in a leadership role.

Masaki: As a product manager you are bridging the gap across departments. Depending on the industry you are in – such as in software where you bridge between users and software engineers. Throughout my career I have looked at the needs and responsibilities for hardware teams, molecular technology, pharma, and other realms in biotech – if you are doing internal versus external it depends on what your company needs. If you are working on something as hardware, or selling as a physical concept you are often under sales and marketing so that you can get that product out the door. If you are working with a biologics company there is a lot of internal product management you are doing if you are building software to support your own platforms. Since Invert's software is external facing we are talking to a variety of users and a lot of my job is talking to those users, understanding their needs, and defining the solution state to help build something that is useful. As the team grows there are various levels of internal scaling support to facilitate the software team be successful. If we are building hardware – like when I was at Culture bioscience – it is more like program management. You are asking “what is the thing we need to build, how can we bridge these teams, how can we stay on schedule, what can we cut, can we actually get this to be successful without overinvesting before realizing value”?

Vega: Grace, you have a hybrid role – you are product and marketing. Tell us about what that split looks like in your role. Tell us about your past roles as well? How much of it was internal versus external?

Grace: I have a weird outlook... As I stop wanting to travel I want to help my more junior product manager speak to customers directly so they can see what customers are doing with our products. That also helps them bring that information internally, decide what markets to go into, what aspects to build, and how to forecast. These are things more expected of senior roles. Unless I have my own product I tend to deploy my team and enjoy conferences and really learn to see what customers are doing. The difference is that this doesn't always apply based on the size of the company and the funding round. I just joined a very early stage company so I fully anticipate I'll be traveling quite a bit which is different from past roles where I had a fully built out team under me. This is how I balance internal versus external. I had gone from Synthego to Natera and threw myself at conferences to understand the market really quickly so that I could make the right decisions. I did that out of a learning need. This has been my internal versus external. Depending on the product you are working on – like at Natera where we were selling genetic tests. There is a hard wall between marketing and product in clinical based companies and there are company reasons for that. There are some products where you are an operation product manager where you make efficiency gains for the running of a test. When you are launching a test that is the only time you get to be external facing and you have to pay doctors to sit with you because that is the part of compliance. You also had an advisory board for

launched products (kits) which is very different from resource use only products where you can call a researcher and ask them how they liked the product. The line is more blurred and I tend to be in the research use only space than the clinical space. I like being able to play multiple roles (internal and external). In the early days you tend to have marketing and product together. In the early days of StemCell we had marketing under Product so marketing could have a career path on their own and that was interesting to see how that worked. I saw that in Natera too where we pulled marketing out so that they had their own path to clients.

Product culture and mindset in biotech

Vega: Let's talk about product culture and mindset in biotech. The PM role is relatively new in the field of life science even though it has existed in tech for a while, books have been written, there are courses you can take, there is structure and philosophy. There are not many handbooks on how to do PM in life sciences. This is something worth talking about and I think we are getting there with a cultural shift. How do PMs fit into life sciences and how does it vary based on the product you work on? Masaki, I'd like to start with you with a philosophical question that comes up a lot in BiB. If teams of scientists and engineers can get stuff done, and can talk to customers, why do you need a product manager?

Masaki: Like I discussed in my previous answer, it can depend on the value of the product manager, depends on what company is going after, and who the major stakeholders are. The value of a product manager is having someone who can consolidate all the information that the company is seeing across the market, provide business impact analysis (that may not be readily available from scientists and engineers), and be able to help make decisions by guiding the direction of the product you are building. The central role is about prioritization and justification vision – what are the things you are building and why should anybody care. A PM has to take all the information from users, people at your company, previous experience, and a new industry you are learning about (or is expanding) and consolidate that information to help the business grow. There is a lot that scientists and engineers can do. There are a lot of companies that do not have a product manager. Software companies that tend to go product-less tend to be built for software engineers, so software engineers are already the users, know the space, and can help drive the product successfully. Depending on the company in the biotech realm, the need for a product manager can drastically change.

Vega: Great answer to a spicy question, thank you! Grace, same question but with a twist. This has come up in other BiB panels and was last asked at a panel of founders, “when should a startup hire its first product manager?”. And how do you justify the value?

Grace: This is a question that is hard to answer. If the founder can listen to the customer and synthesize information from various places you are good to go. You can do that until your volume or product offerings get too big and then you need a product manager to do that strategy and prioritization. The challenge is when you have people building products for themselves instead of what the customer's needs are. They don't hear the customers' needs or work in a silo... It is very dependent on the company you are at. For my path, I am often looking at

leaders in that space to determine if I am even needed. Large companies are a no-brainer – you need a product for managing portfolios and creating organization. For the smaller companies like Tierra, hiring Product a year back might not have been the right time. Now we have a good platform that synthesizes proteins pretty well for our customer's needs. So now it is about adding new features that we give to customers to suit them. It is very dependent on the company and the people currently making up that company. If those folks can do Product work, you will be able to get information you need to build the product that has commercial utility. If you can't fill that role it is better to hire someone sooner to do that job.

Vega: Now a question for Jack, but more about scaling up. When companies become bigger they inherently will require processes for how they do product development. What is the PM's role there and what do you gain and lose when you introduce these processes when you scale up?

Jack: Speaking as someone who was at a company that grew by 1000s, I think that sometimes growth can outpace the ability to make and hold onto processes. I think in a slightly different way. In sciences you are service oriented, you don't often package your work because it is inherently an experiment. But you are doing an experiment for a purpose and should be focusing on the what and the why. Sometimes you lose sight of that and only focus on the how. If you can keep sight on the why and the way you can build that product culture and you may not need processes that scale with that because that idea of packaging your work for reuse by others could be inherently baked into how people work. I see that right now where I work – some groups are good at packaging and some groups are poor. This isn't a great answer for how processes scale and I may not have the experience to give a well-lived answer here. I would think about trying to impress behaviors upon people. Processes are an area of last resort. If you can't get that product thinking ingrained in your culture you probably are following up with a process to make sure people follow up. Think of portfolio management – that is keeping track of what is going on. If people are clear and transparent about what they are working on, why would you need to keep track of what is going on? Shouldn't everyone be well-informed? To a point, and then you need a way to keep track of that since you can't listen to everybody at everytime. You could easily have people putting their information into tools as opposed to having a role that hunts those people down and makes them adhere to some rigorous process. You can approach it as 'what is the behavior you want the tools to enforce' versus 'do the behaviors exist today and do we have the tools'? It is a spectrum of existence of behavior versus existence of tools and where they meet in between. I may not have answered the questions.

Vega: I agree, processes can be more about the company's culture and what they are trying to instill internally.

Jack: Some processes are required. If you want to go do GMP validation - that is a process. There is a legal requirement that exists. But you don't need a process for processes. Some companies have a SOP for writing SOPs. And a SOP for writing SOP templates. That makes sense to a point but then there is a SOP for administering the SOP writing template for SOPs. That is where the process gets way out of control.

Vega: Mace, I want to tap your experience next. I want to know about your experience as a startup advisor and a consultant. What are you seeing in terms of product culture that Jack is talking about in startups you talk to? Do you see them hiring folks like you to fill the gap, are they thinking about hiring product managers? What is the culture like?

Mace: I focus more on early stage Seed and Series A, where product management is still founder driven. That makes a lot of sense because it is the founder's responsibility to define the vision and get to product market fit. That is not something that someone on your team can do because the founders have a specific vision of where they want to take the company. What I am seeing is that companies don't know when they can fundraise next so they are keeping teams lean. YOU see what Grace is describing – you have several different people at the company taking on the Product role. SOMETimes they will bring in a consultant (which is where I enter the process), and a lot of startups are keeping things very lean. They are thinking about how much runway they have and how much runway they need to get to product market fit. They are looking at how they will reach their next funding milestones. Sorry to be a downer, this is just what I am seeing.

Controversial & hot topics

Vega: We have a lot of founders and folks that work in startups here in BiB. This is great information you have shared. The last topic is a mix of controversial topics that have come up in BiB that I want to dive into. That will be the last question and then we will open it up to the audience.

My first question is for Jack. Multiple discussions have been had about whether a PhD helps the role of a PM. Is it something you need to succeed? Our panel has two people with a PhD and I'd love to hear from everyone. Is it something you need? Does it help you or is it just another title?

Jack: We could ask you the same question! I don't have PhD – I did biochemical engineering and I was really big on techno economic modeling and the cost value of money so I proposed to my PI a financial model and I treated the knowledge as the technology part and I proved it to her that it was not worth my time or intellect to do a PhD and she was pretty compelled by that and she let me go. I don't think a PhD is required in product but I would go back to behaviors that you want to enforce. Having a PhD means there is an amount of grit, humility, and work you have put in to make something happen. You know what it takes to get shit done and that can never be discounted. If your PhD is in molecular biology and you are a PM at a software company you are probably never going to use that. If your PhD is in genomics you may not use that at your company where there is a deep domain expertise. You have a much larger toolbox than people who come from a traditional SaaS who have a degree in marketing and have never worked in the sciences. That is not to discount those experiences but that PhD gives you a well to pull from. People can build that well by being bio-curious. So a PhD is helpful but not required – and it exists in a spectrum. Some people use it really well and some people don't. There is an internal self determination on 'how much do I want to use the knowledge I have?'. You've

worked hard for it, it is really valuable, and you should use it. It just doesn't need to be deployed in every case.

Mace: I want to chime in. I have a PhD, I spent 6 years in the lab, I have one of these PhDs where I spent 4 years trying to find a thesis project through lots of failure. The thing I took away is trusting the scientific process – coming up with a hypothesis and testing are things you do in product management. It gets hammered in the lab because experiments take a long time. I do software data PM and that is a different time cycle and level of investment. I agree that having a PhD teaches you a lot of grit, and in early stage startups having a PhD helps you become comfortable with navigating ambiguity. As a PhD student your experiments are going in completely different directions than what you'd expect and that is just like a startup – it equips you with the tools to deal with where the company is going and the stops you can take along the way. That is just like any other experiment. This is just like a PhD – if your PI had funding you could do really interesting experiments and learn from that. Whereas in a startup environment when you are founding something there are higher stakes where you probably have less time to demonstrate traction to get more funding.

Grace: I want to say my piece. I also have a PhD.

I lean on my PhD the more time I spend in industry. Definitely being able to speak to customers and having them be able to speak back technically is valuable. At Natera I don't fully understand how lab testing works, so hearing from doctors and their struggles with reimbursement from Product is a lot of note writing. I'm proud of my ability to take and transcribe to find problems we need to solve. That is harder when it is out of your domain. The cool thing about a PhD is that there is a lot of transferability in the experiments and protocols you have done and the tools you have used. If you are building a tool like software (during my PhD we kept physical notebooks) and can use it and have an opinion you are the end user. You don't need to talk to 50 customers – your experience is the same thing they might have problems with. It made my job easier when I had a PhD in space. My current company has been so easy because it is in the biochemistry space. It has been easy to do the job – I need purified proteins during my PhD so I understand if my product will meet 70-80% of a customer's needs.

Prompt 5

Vega: In my past role as PM the company swore by product management training, and I also hear people who have mixed feelings about it. You learn what you need on the job. I want to hear from the panelist if the bootcamps are useful? Or do you put it on your resume and it helps?

Jack: I've graded people who have come out of those bootcamps and was impressed. Some of these boot camps are only 6 weeks long and not full time. There were people who came from very diverse backgrounds and had no product orientation. There was someone who had worked back at the shop retail. There is little PM background that you get from that role but they made

some amazing products around recipe management. You can get those skills because you are shifting your frame of thought to be more product-oriented. There are so many frameworks and ways to do it. I don't think there is an end all be all – you learn it on the job. Some stuff like product for product sake, or process of process sake - those phrases might start to sound the same. I have a 256 step product development process – do I follow those steps? No. And if I told my team there were that many steps they would be massively upset. But they are what they tell you in the classes. It comes from experience on what steps you can skip – just like knowing you can skip interviewing 50 users based on one round of discovery. It is a good step to go to a bootcamp and it is hard to get your first product job so it can be good to have that certification.

Grace: Templates are really helpful. I've been asked by my team members from previous companies when they go do those things to put them in a gDrive. Those are the things you need at the end of the day. You could organically fill in those templates and having to make those templates from scratch could be hard. Think about a forecasting model in Excel you can make as a macros where you can just enter your data. Like Jack said, if you went to a larger company where there were 30 product managers you have many layers of support. You have your team lead, then all the product manager team leads that went into the AD that went into the Director, who went into the Chief Commercial officers. This large group and 30 of your colleagues makes it much easier. Having these templates makes it much easier to go to startup and get going.

Jack: I don't know about the Atlassian templates for a PRD – they are very sparse. I'm a big Atlassian fan. Some of the good product frameworks can be distilled down into motivating questions. What part of the process are we using? I worked with someone who had 10 motivating questions. I can't quote them to you because they are paragraphs but you don't need anything except those questions and you can find your way. Sometimes it is great to mind from a pool of experience.

Masaki: Overall it gives you a space to learn and try that process in a way that is lower risk than doing it at your own job. I did a short course when I was transitioning to product - it was focused on being a founder and doing discovery. These are the people you should talk to and validate with – your gut may not be right and these people may say something that is not right either. So can you develop something that people actually want? Can you translate their vision into your vision so that it is executable with low risk? In my experience I've seen people transition to product from multiple directions – whether they were a founder, they were a software engineer tired of people telling them what to do and want to do PM better, people from business school with a MBA and drive economics behind the product based on what people want to buy. And people from the technical domain whether that is software or science - with a PhD or not. People leverage what they know and then leverage extracurriculars and courses and books, blogs, and slack channels that talk through the processes. There is no one that is correct because they are many types of product roles based on the company you are at. You may approach a product in a different way so it is about how you adapt, leverage the resource around, and be resourceful to get to the end product.

AUDIENCE Q&A

Question 1

In the cycle of product development, Biotech tends to move at the speed of biology and we'd like it to move faster. Software there is a precedent that moves pretty fast. All the physical liquids and things that need to grow haven't caught up. How do you as a product manager deal with the different expectations around how long development and feedback cycles happen. And how do we make the feedback loop faster?

Grace: That is a triggering question!

Jack: I don't think we do enough to treat our science as a product which contributes to the slowness you may be describing. From experience and from looking over shoulders, very few scientists write hypotheses and set an experimental design in place before walking into the lab. There is a slap together nature of how some things are done. That contributes to the ideas of slowness - disorganization in how the information is structured leads to friction points that makes the feedback cycle harder. Some of it comes from how you organize your data and information to make those feedback and decisions. Biology is more expensive than software so you need to squeeze as much value out of it as possible . Given we don't have a universal data model for biology yet I'd say we are still going to be slower until we have something like that in place. That may be a contentious topic on its own.

Mace: We can look at other industries like hardware products as an analogue where there are other industries where it takes longer to get through the cycles. That is not a bad thing. That is just how the product is built in that space and how quickly and how much you can iterate. If you are working on a FDA regulated device the iteration cycles are going to be much longer because it is highly regulated. It is important to iterate at a cadence that makes sense for the product but there is a lot we can learn from other industries like hardware.

Masaki: There is also an aspect of finding out what you redisk along the way. How much can you break down into smaller steps – do you not have to build the entire bioreactor to see if it is going to work or not. You can test the thermal systems and other small components so that you have a pathway to success. You won't be asking why the cells died. For biology you are developing a platform for stem cells or organ models you will be stuck at the pace of the data you can generate. There are ways you accelerate by data mining other sources that already exist and smaller experiments you can run that don't rely on the full model being available.

Grace: You have to break it down into pieces that are more digestible. You should try to see if you can use the data for marketing and other purposes. What you generate at the bench should not solely be for the purpose of developing a product or moving the product along - that data should be collected for purposes that are outside and external facing. That is valuable and then the scientists won't need to do it again. The other part I've noticed is that we are transitioning.

You have a generation that did a lot of things through automation where my generation did zero things through automation. It is a weird divide. As a product manager you should keep an eye on how the science is done. If you can add automation or farm it out to experts if it is not your mission and vision at the company. You don't need to build that expertise, you should consider relying on other experts and then you get the data faster. You don't have to have everything built at a given time. You can work towards it but you don't need it in the early days.

Question 2

I'm a bench scientist aspiring to be a product manager. When I apply for a job they say you need 1-2 years of experience minimum. You need to get into the role to start your experience and a lot of learning is done on the job. How would I navigate that situation? How would communicate you can learn on the job and get your first product management role?

Mace: It is tricky getting your foot in the door. One piece of advice I give to a lot of aspiring PMs is that you take on a role at your current organization to take on roles that have PM components. It is also important to know yourself and how you best learn. Some people learn well by taking courses and there are people who learn better by doing. So it is knowing how you can learn best. You don't have to have the official title of product manager to have product manager experience – that is something that is important to remember. What are the stories and experiences you need to get and see if as a bench scientist you can tag along with existing PMs in your organization.

Jack: The behavior of being product minded - bring that to your organization if it does not exist is an impressive talking point during networking, presenting, and in a cover letter. You don't have to say you were handed tools and frameworks (which are great), instead you can say you brought them to your company, you did the change management and the marketing and helped your team improve. You did not just do, but you educated. You can make yourself a product manager by bringing it to your team. There are a lot of parts of science today that are not treated like products but could be. So there could be a ton of opportunities in any role that you achieve today to make that impact and gain that experience without having the direct title.

Question 3

This is for seasoned product managers that want to go to a leadership role in product. Is there a skill that got you there or can it all be learned by experience?

Mace: Managing a PM is very different than being a PM. One of the challenges with leadership is being clear on your role and responsibilities with your team. It is tough to work in an environment where the roles and responsibilities are mixed. It can be hard when the decision making power is mixed. I've run into situations where founders don't draw that boundaries clearly and you end with a ping pong effect. You can go back on decisions. A lot is learning on

the spot and you need a different style based on who your team members are. Your team becomes more like cross functional partners in addition to your own team. It is challenging being in a leadership position because you are both managing your immediate team and also thinking about the bigger picture of how you work with the sales team or the CEO, or figuring out how to get resources for your team and showcasing their work. When you are a PM you are thinking about what you can do for the product. A lot of people make an analogy I like – when you are in a leadership position you are more conducting an orchestra, versus when you are a PM you are doing the ground work as an artist.

Grace: It is a lot more qualitative. I became a team lead after I went in as an IC with my own product category. I still managed that product while I was managing with my other product managers. If you can show leadership and independence as an IC that is easy in product. Unlike research you don't have to report up your finding and research and have a lead go with it. If you are fortunate enough to have a team lead that allows you to show your independence you are almost the CEO of the product. If you can show the product to be successful with your innovation and ingenuity and how you manage it then that is how you come to the surface. A lot of my leadership impurities were actually solely because they had known me from previous opportunities. As a PM the limelight is always on you so when you are performing it always helps you for the subsequent jobs. Today right now that opportunity might not exist, but in a couple jobs you might see it show up. I exited Synthego as a team lead and had a job in between as an IC, then the chief commercial officer from Synthego is the CEO of Tierra Biosciences. You are creating a network of people who will eventually become leaders and then they will tap on you because you've made a successful portfolio and you were memorable.

Masaki: It is important to know if you want to manage people. Being a good IC does not make you a good person in terms of managing the organization and the requirements they may have, and enabling your team to provide the leverage for the work they may need to do. It is totally ok to not go into management. It is talked about across many industries where you have frustrations with your manager because they suck at managing people - sure they were great in the lab and a great scientist and deserve recognition but probably should be a principal scientist instead of a people manager. You don't have to jump into being a people leader if that is not something you want to do.

Question 4

I have a practice and tactics question. You've touched on taking big problems and questions and testing them rapidly. How often in Biotech is that truly possible? And in cases where you cant break something down how do you approach it when you have to take that leap of faith?

Masaki: For the things that are innovative there is an opportunity to justify the cost of the research. Trying to figure out what the value proposition is and test it along the way. They might always be other impurities like AI that may not have immediate results but have a longer form vision. It goes back to cost versus value – can you justify the best that you are taking? If you

can't collect the data along the way, are there people you can lean on or people that have approached the problem before and ask them? There are people in and out of the product space that have looked at the feasibility of a product and would be interested in using it or buying it.

Jack: I like to say the word modularity a lot. I think that is true. If you are bringing a therapeutic asset to market like an antibody. That is a monolith you could move on faith, but someone has done research that that product is worth bringing to market. As you go to develop and commercialize it you can't take that antibody and go from step A to B. You have to decompose the monolith into its subsequent parts. Each of those parts are potentially products. If you think about unit operations from a chemical engineer perspective those have defined inputs and outputs, have specifications, and behave in a certain way. They start to look like products. You can treat those individual unit operations of your therapeutic process and products. If your bioreactor is really successful at growing CHO cells it might be great for growing CHO cells for all other assets in your pipeline. Which means that if you treated that bioreactor as a product and as a module you might be able to expedite and better move on a future therapeutic asset by understanding the portfolio of pseudo products that exists in your pocket today. There is an element of looking at things a little differently and seeing how much you can break things down. There is a point you can't break it down and that is where you pull on main experience and existing trends and examples. We modularized semiconductor manufacturing, cars, nuclear reactors, homes, airplanes – there is nothing to say we can't do it for the more bio-focused things today.

Question 5

I've been tangential to Product in my business development function. The problem I see a lot is you get pulled into the direction of your biggest customer. How do you balance that with the needs of all your customers?

Mace: I observed this at the first startup I was part of. We had an early customer, which underscores the significance of having a product management function. If you're a sales-driven organization, you'll naturally pursue revenue, and rightfully so—revenue is essential. However, if the aim is to develop something repeatable—a product that can serve and scale across multiple customers—it's crucial not to overemphasize your first customer. This can be challenging, especially if your organization is accustomed to meeting the specific needs of that customer. It's important to validate externally early on, as there might be aspects overly tailored to that one customer. You may discover that some of these aspects are too customized to meet the customer's unique needs rather than being general solutions for the industry. The critical question of the day is whether you are building a consulting business laden with customizations or a product-centric business focused on scalability.

Masakai: This presents an opportunity for a solution engineering organization to facilitate the development of more customized additions to the product. This involves a conversation between the Sales and Product teams to understand how it integrates into the larger roadmap, if at all. It also considers how robustly it should be developed initially versus in the future, and how

this development should evolve. Building out the product in other areas may unlock potential. However, there is a risk of transitioning into a consultancy as you evolve (or devolve). This introduces an important topic we haven't discussed yet—productization. I'm eager to hear from the rest of the panel on how you have managed to scale a technology your company possesses into a product.

Grace: We did this at Precision Nanosystems. We had the services arm for the purpose of understanding new products we could productize and also provide as a service. You could charge 10-40X more as a white glove service, and your target is very specifically Pharma in that case. Then you can productize it to make it more democratized and accessible to everyone else. That is why the one customer I didn't double revenue for was saved because of that. That is a common path I've used in many roles, especially in a startup. You may not know what product direction to take, so with a services arm, you need discipline. The co-founders want to take in all business, so you want more of a leash on that so you don't open the floodgates and take on projects you can't deliver on. You need to have a good feasibility process. I sunsetted 50% of the kits we had on the market at Precision Nanosystems because it wasn't worth making since we made it for only one customer. Those were tears in our CEO's office, but sometimes you need to make the decision to cut a product because it is only serving one company. You can continue to make it as a customer kit (which is what we did), but those are the hard decisions you need to make when the market numbers don't add up.

Question 6

Biotech is in a bit of a downturn. How has product development changed in response to this? How has what your customers are asking for changed? How do you approach product development, and is it different?

Masaki: The major thing is about finding your total available market. Find out who will be paying for what, and make sure you are talking to the right buyers. Right now, there is more stringency around budgets. So, if you talk to a bench scientist who thinks your product is useful, that is great, but it might not be able to get through the budget process. Are you delivering value higher in the organization that can drive savings or operational improvement that helps the company be more stable or have greater progress?

Jack: I come from a place of privilege by working on something that is farther out. We talk about how we can take what we are developing today for a 2045 release and ask if there is a unit of value we can offer next year to make people pay for it. Some of our conversations are about pulling off smaller, valuable pieces that keep the product moving in the right direction and thinking about how to manage and split those pieces while still contributing to the overall product. I don't have a great example, but it is harder for a therapeutic asset – you can't take a Fab off your main antibody and say 'we are going to sell this' – it does not work like that. For some of the medtech and software type things, there is more possibility there. We see it with bio platforms or platforms in general. You should probably not be selling or making a platform play until you have a couple of examples of things working before they go through the platform. That

is a good example of taking a step back on the platform and thinking about an individual piece that can go to the market while keeping the overall platform internal. You can still manage that as a product and that can prove or disprove if you should continue spending money on the much larger platform.

Mace: Agree with the platform comment. A lot of the founders I talk to—even though they set out to build a platform business—have focused more on being product or agent focused. That is a dynamic I've seen where you can't just do platform for platform's sake. It needs to be something that can get to the market.

Jack: I don't say this from experience but secondhand, true platforms or two-sided marketplaces are very few that are successful. They are very hard to build, very expensive, and you probably won't be successful. Don't jump to a platform - pick something else because good platforms are hard. There is a great book on this called "The Platform Revolution" that was written by some Nobel Economists. It is a good study of platforms being hard even though there is still value in them.

Shantenu: You mentioned there were resources. Can you give more explicit recommendations on people, platforms, or books that have shaped your learning or that you are excited to read?

Mace: An author I really enjoy following is Deb Liu – she is the CEO of Ancestry and she is a fantastic writer. She comes from a tech background and she writes a lot of great pieces on how to do product management well. Gives frameworks and different ways of thinking about managing careers. Also Women in Product is a fantastic group. I am pretty active in it and it is a really great community especially for women in this space to connect with other PMs - especially about the challenges they have. We have an active facebook group about the problem you have and be honest about the experiences you have had. It is a fantastic community.

Masaki: In terms of spaces there is Lenny's Product Newsletter and associated slack channel. It is a great place to talk to other people, vet ideas, and talk to other people who have had similar experiences. Networking is a big part of it. I don't have particular authors I have at the moment.

Jack: Yes to both of those answers and I go on to Reddit. I'm really curious about people where want to bitch and complain. That is an interesting resource because it tells you what these tools are missing or where people still have questions. If you are thinking about mastering and building up skills it is good to have vetted information and where people think there are gaps. Those tell you gaps in the market you could fill with your knowledge or those tell you you are not the only one. It validating to know the resources and the non-resources. I tried to look in between spaces as well.

Vega: You should join the BiB product channel to hear about events like these. I would also recommend from my last role as a PM that companies might have funding for a course. Take an in person course if you can as the in person networking that happens from those events can be useful. Potentially more useful than the actual course. I took one at Hass at UC Berkeley and the people I met were more practical than the source.

Jack: Stanford has a good course as well.

Grace: I've enjoyed the Haas one as well. I also still read papers and that is a majority of my intake. I also do podcasts on human behavior. Luke Timmerman has talked to CEOs who have gone through ups and downs.