Steve Lewis 00:10
Welcome to Speaking of Mol Bio, a podcast series from Thermo Fisher Scientific about molecular biology and its trending applications in life sciences. I'm Steve Lewis, and today it's my pleasure to welcome my colleague Cam Cyr to the show. Cam is a senior technical sales specialist at Thermo Fisher, and he specializes in molecular cloning, PCR technologies, isothermal amplification and other molecular biology topic areas. Cam's journey from academic bench science to supporting diverse customer teams gives him a front row view into how customers actually make decisions in the real world. I begin our conversation by asking Cam to describe his current role and to share his career journey.

Cam Cyr 00:59
I'm Cam. I'm a molecular biology and cloning specialist for Thermo Fisher. And so the high-level job of a TSS at Thermo Fisher is to serve as a trusted scientific partner, and specifically for our molecular biology and cloning solutions, helping those customers choose and apply the right tools to achieve their goals. I started out as a bench scientist. I did a lot of wet lab research at Union College, where I was getting my undergraduate degree. After Union College, I started a PhD program at Clemson University, where I was working in the George lab looking at the epigenetics of Australian zebrafishes. It was at the height of COVID. You know, a lot of things were kind of changing in the world. I was very far from, far from my home in New Hampshire, so I made the decision to leave my PhD program and join a sales development program at Thermo Fisher that allowed me to relocate to Boston, Massachusetts, closer to my family.

Steve Lewis 01:55
How have you liked Boston?

Cam Cyr 01:57
Boston has been one of the greatest decisions so far in my life. The food is great; the sports teams are even better. Go Celtics! And it's just been a great time being close to family, close to friends. And the best part of it all is the science up here in Boston is really cutting edge. So, I've gotten the chance to work with some of the most amazing scientists, the most amazing biotech companies that are really starting to change the world and in the lives of people that we work with.

Steve Lewis 02:25
Have you seen any common threads in today's world? We know it's very dynamic right now. What are you seeing out there?

Cam Cyr 02:33
There's a lot of pressure around science and around making the right decisions. Balancing costs, balancing performance, balancing quality, and really trying to get to that answer of, you know, “Can we make this medicine? Can we make this tool that's going to have a tangible positive impact on someone's, someone's life?” And so a lot of the themes that I've started to see recently is a lot of pressure on, you know, cutting costs, saving money where you can, but also maintaining the scientific integrity and the high-performance results that are needed to reach those medicines and those breakthroughs.

Steve Lewis 03:11
You mentioned performance. What does that mean in a customer's mind?

Cam Cyr 03:16
It can mean variety things. Performance, especially in, you know, the language that we speak as molecular biology and cloning specialists really comes down to a lot of attributes in enzymes. So, for example, a reverse transcription enzyme, a lot of performance, or aspects of performance that are considered when selecting these is thermo stability, processivity, the sensitivity of the enzyme, formats and flexibility that it comes in, and also the tolerance to inhibitors that might be left over from the sample extraction process. That could also vary for PCR enzymes where it's similar, but customers might be also looking at challenging templates that have a lot of GC-rich content. Or maybe they're a long DNA template that requires a little bit of a stronger amplification technology. So, there's a variety of aspects of performance that are considered in today's molecular space.

Steve Lewis 04:09
Now Cam, that response was pretty technical. Can you explain what makes the technical sales specialist role so unique?

Cam Cyr 04:19
I think what makes it the most unique is while we're in the weeds of the features and benefits of our products and the specifications of our different enzymes, the crux of the role is really tying that to a customer's needs or a client's research goals. So, they might be constrained by certain costs or certain quality metrics that they have to meet. And really balancing the technical aspects of our premium products that might have some cutting edge features with that client or researcher specific experimental goals is often a challenging part of the role to make sure that they're getting enough enzyme to get them to their successful result, without, you know, offering too much of a, you know, an enzyme.

Steve Lewis 05:04
I'm struck by just how easily and quickly you rattled off so many different components of molecular biology, from sensitivity and specificity to even specific reagents. Did you have a pretty intense training, and did you expect to be so close to the science in this role?

Cam Cyr 05:24
So, a lot of my training definitely came from my customers. I will tell you that I learned a lot about our product portfolio, but the coolest part of the job is learning about all the different ways that our customers and researchers use them. So, while there was a great deal of training, a lot of what I've learned has been on the fly, in role, just really talking with customers, learning about their goals, what challenges that they've been facing, and really looking into our portfolio, leveraging our scale of resources, to help them solve that.

Steve Lewis 05:55
Now does everyone who you interact with, especially in such a hot biotech and pharma hub like Boston, do they all have similar definitions of performance and costs? Or is it varied by maybe the different customer segment?

Cam Cyr 06:14
It certainly varies by customer segment and also how they are defining cost. Performance is typically a little bit more of a stringent definition, where there's specific attributes of enzymes that are measured and are relevant for a certain research outcome or experimental outcome. Whereas cost, that's where it truly starts to diversify. A lot of researchers may consider cost as purely a price metric, or price per reaction, price per amplification. Whereas some researchers might consider a larger pool of variables that go into cost, whether it's labor time, instrument time, the sample value, downstream risk if the if the experiment does not work, also schedule impact, perhaps it's a very long-term experiment. So, there's a lot of hidden costs that researchers are starting to consider as a component of, you know, cost, not just price.

Steve Lewis 07:09
Let's dive a little bit deeper into that. So starting with maybe, let's say I don't know, premium performance. What does that mean to somebody who's, like, interested in the best?

Cam Cyr 07:23
Premium performance can offer a variety of features. But what I think it means for a customer is they're going to have the confidence that the enzyme or really the product or kit that they're using to achieve a research goal is going to achieve that research goal in a streamlined manner, faster than other kits. It's going to be consistent. They can have the confidence that if they're going to run technical replicates of you know, let's just say qPCR reactions, for example, for technical replicates, they're going to get the same data every single time, whether it's a Tuesday or a Friday. So consistency is something that really matters, but all of that really goes into a premium product really ensuring the success of a customer's experiment.

Steve Lewis 08:09
And what would that look like for a pharmaceutical customer?

Cam Cyr 08:13
So, for a pharmaceutical customer or a biopharma customer, a premium product could really step in when working with low input or a replaceable sample. So an example of this is rare tissue. Maybe they're doing single cell work where, you know, isolating those single cells can require a lot of expensive instrumentation and reagents itself to actually prepare that sample. So in the terms of, or in the space of a pharmaceutical company, a lot of those organizations and research groups turn to premium products so that they can have the confidence that when working with these rare samples or rare tissues, or perhaps difficult to prepare samples, that the downstream analytics aren't going to be where their experiment gets derailed. They have the confidence that, you know, the reagents they're using are going to get them to their experimental result, which is truly what they're after.

Steve Lewis 09:09
What are the kinds of products that you see?

Cam Cyr 09:11
A good example of, you know, products that, or comparison that pharmaceutical companies can make, and to tie this to the products that I talk about every single day, would be comparing SuperScript™ IV VILO™ versus an enzyme like High-Capacity. And these are two different reverse transcriptase enzymes with very two different performance profiles. SuperScript IV VILO is our premium offering. It has a 10 Minute reverse transcription time. It's one of our most sensitive RT enzymes and has a really strong thermal stability, which allows you to work, or run the RNA or the RT reaction at a very high temperature, which linearizes the RNA and allows for broad coverage of challenging, challenging targets with secondary structure. Compared to High-Capacity RT. Now this is going to be what we would call more of a value-oriented enzyme. This has a two-hour long RT reaction process, so that's, you know, almost two hours longer than the SuperScript IV VILO. It still has a wide dynamic range and a variety of formats, but it also operates at a lower thermal stability of 37 degrees Celsius. So less capable to work with difficult RNA targets with secondary structure, but it's still going to get you to that job or get you to that answer and that successful research output, but at a much longer time. So pharmaceutical organizations that are competing against rival pharmaceutical companies to bring their medicines and their solutions quicker, they want to have faster data that they can be confident it's going to be reproducible, confident that you know their enzymes are going to work faster than what's available and ultimately beating their competitors to those clinical trials.

Steve Lewis 11:01
Just for fun, what's your favorite polymerase?

Cam Cyr 11:04
My favorite polymerase, hands down, has to be Platinum™ SuperFi II DNA Polymerase, just because of how impressive the fidelity is and how much that matters for build-critical amplification.

Steve Lewis 11:17
How long did it take you to figure that out?

Cam Cyr 11:19
I think after talking with customers about their build-critical amplification steps and comparing that with the conversations with customers who were doing more routine amplification steps, like genotyping, or, you know colony screening for cloning, cloning reactions. That's where it really helped me understand that, you know, the high-fidelity enzymes and Platinum SuperFi these enzymes are used for really cool applications. Whether it's, you know, B-cell sequencing or in the upstream processes of antibody engineering. It's very cool what, you know, high-fidelity enzymes are currently used for in today's scientific space.

Steve Lewis 12:00
Do you have any other examples where maybe premium performance is a really obvious choice?

Cam Cyr 12:09
Yeah, and it's a good segue, because it ties into the Platinum SuperFi II DNA Polymerase quite well. So a lot of customers today are focusing on monoclonal antibodies. And a strong way or method to

generate new sequences of antibodies and discover new sequences to test and screen is B-cell sequencing. So many customers will sequence antibody genes and transcripts from single B-cells, and then move on to then clone, express and analyze these proteins in, you know, in vitro. And they're going to test it for different, you know, purposes. “Is it going to modulate the response that we want to biologically?” And so when you're amplifying DNA, you want to make sure that that sequence is preserved, because the sequence you start with is then going to get propagated throughout that multi-day, multi-week experiment. And so when you have a high-fidelity polymerase, like SuperFi II, you're confident that you know whether you're getting your DNA cloned into, you know, a vector, you can then amplify that plasmid with a high degree of accuracy, rather than using, you know, a low-fidelity polymerase, what might introduce artifacts, mis-incorporate nucleotides, which can then have a detrimental impact on your downstream protein expression.

Steve Lewis 13:29
Pulling on that thread a little bit. Up to this point, we've kind of been talking about the creme de la creme of the molecular biology products out there. You don't always need that, though, right? Sometimes you can get away with maybe more cost saving focus?

Cam Cyr 13:47
Absolutely. And a term that I've used a lot so far is build-critical amplification and that's really where we see the premium features shine. However, there are other areas and applications that don't require build-critical amplification. One good example of this is genotyping. Genotyping is a very common workflow that is very important, and the answer is not build-critical. It's truly a yes or no. And so if you think about that, whereas, you know, build critical-amplification might be turned into, you know, a protein downstream, the yes or no answers, these are really bands on a gel. So an example where customers can truly save and look toward enzymes that you know might not have the highest fidelity or might not, have all the latest and greatest features is genotyping.

Steve Lewis 14:42
Whether you're running a quick PCR check, or verifying nucleic acid quality, gel electrophoresis is often an important checkpoint in your molecular biology workflows. Now there's a simple way to get the answers that you need. Introducing the Invitrogen™ E-Gel™ Power Snap Lite system, the latest addition to the E-gel electrophoresis family. Designed for quick nucleic acid verification, Power Snap Lite combines gel running and imaging into one compact system. Just load your sample, run your gel, and view results in real time. No buffer prep or gel casting required. With preset protocols, an intuitive touchscreen interface and integrated imaging, it's built to help you predictably move through routine workflows with less setup and fewer steps. And when your work calls for deeper analysis or higher throughput, the Invitrogen E-Gel Power Snap Plus system is there to support more advanced applications. Explore the full E-Gel system lineup at thermofisher.com/egelsystems. For Research Use Only. Not for use in diagnostic procedures.

Steve Lewis 16:00
Cam, it's been so interesting hearing just your depth of knowledge, and I'm really impressed by the level of technical detail. I'm curious, talking a bit about you, what inspired your decision to pivot out of R&D and academia?

Cam Cyr 16:16
It's actually funny. I was sitting at my lab bench in Clemson University, and a Thermo Fisher engineer actually stopped by to fix one of our Heratherm™ ovens, or incubators, that we were using for our experiments, and we just started talking about Thermo Fisher and different opportunities out there. And that's when he was able to connect me with a recruiter just to talk about different opportunities in the scientific world that aren't necessarily tied to working in a lab. I was also able to, thankfully phone a friend that I went to college with who worked at a similar company and was doing a similar role supporting centrifuges and freezers and he had some really cool stories about different challenges he was able to solve, people he was able to help, and also people that he was able to meet being in a customer-facing role. So that was my biggest driver, was understanding that you can stay close to the science and you can still work with cutting edge science, but from a different perspective. So that was a really attractive part of the role for me.

Steve Lewis 17:20
Absolutely and that definitely, I know resonates with myself and many of our listeners. We speak to so many who may have thought that they would go down one path and then ultimately realize just the breadth of opportunities that are available in life sciences and biotech and pharma as a space, and how many different roles are just absolutely critical to making the next steps of science and next innovations so impressive.

Cam Cyr 17:52
Yeah, and one of the great things is that you can have that love for science and still apply it without doing bench science. You know, I remember when I was running, you know, running qPCR reactions in my undergrad on a QuantStudio™ 3, I wasn't necessarily super excited about the Ct values I was getting, but I was really excited about the QuantStudio itself and how it worked. You know, what makes this different from, you know, the SimpliAmp that I'm just making cDNA on? How does this actually read, you know, the amplification and see of cDNA in real time? So asking those questions and having the curiosity of how things work really led me into the role that I am now.

Steve Lewis 18:34
And we're so lucky to have you. I've been working with you for about four years at this point, and you're definitely one of my favorite people at the company, so thanks for hopping on the podcast today.

Cam Cyr 18:46
Truly appreciate it, Steve, it's an honor.

Steve Lewis 18:49
Moving back into the science, I'm curious, you are in the Boston area, so you know you have some of the world's top universities. You have Cambridge there as well. What emerging technologies are you seeing that seem really exciting?

Cam Cyr 19:06
Well, there are quite too many to pick from in the Boston area, as far as the emerging technologies that are coming out. If I had to focus on one technology that really excites me, it would be rolling circle

amplification. This is being applied in so many different facets across the biopharmaceutical and biotherapeutic world. Whether it's creating a cost-effective way to prep samples for NGS, or amplify plasmids ahead of Sanger sequencing, or even, you know, using it to create therapies. Rolling circle amplification, or RCA, it's truly a cool application that Thermo Fisher, quite frankly, is pioneering with our EquiPhi29 enzyme. It's an engineered phi29 enzyme that has very, very extreme processivity. So you can get, really from a femtogram level of DNA, extreme levels of amplification and high yields, that can then go on and support multiple experiments.

Steve Lewis 20:12
What's a use case? When would somebody definitively choose that?

Cam Cyr 20:17
So a good use case for rolling circle amplification would be, say you're an antibody engineering company, or you're a antibody engineering group within a larger pharmaceutical organization. You're going to be working with a lot of different plasmid constructs that you're creating, and then screening for a therapeutic effect of, you know, the downstream protein, and so you need to sequence verify all of these plasmids once you create them. And so having a way to, you know, create enough or amplify enough plasmid in a high-fidelity manner to then go on and use for sequence verification, that's an important bottleneck. And so in previous, you know, lives, you had to do a Mini prep, or a Midi prep, create enough plasmid and then send it to your sequencing facility. Whereas now you can use rolling circle amplification to directly amplify plasmid DNA, whether it's an unpurified colony, whether it's a Gibson assembly reaction, or whether it's the purified plasmid itself, you can actually amplify that directly now and go straight into, you know, the downstream amplifications. So, very excited about that, really taking out the pain of a lot, of a lot of workflows that customers are using.

Steve Lewis 21:30
Earlier you mentioned binary genotyping. What is a like case study where you would be interested in those kind of quick and dirty approaches?

Cam Cyr 21:44
So a good case study would be a core facility at an academic institution that is responsible for, you know, maintaining transgenic animal models. Transgenic animal models are used for a wide variety of research applications and supporting experiments as model organisms. Disease versus natural state comparison. So, it's a very important facility and capability to have, especially at a, you know, a high-power academic research institution. And so, genotyping really comes into play here to ensure that these animals are expressing the right transgenes. That all the genetic modulations that have been made are effective, and they have been made effectively. So, genotyping gives you that yes or no answer which really shows up as bands on a gel. So, this is one of those non-build-critical amplification steps that researchers can really look to save money on by using quick and dirty methods. At Thermo Fisher, we have a PCR enzyme called Platinum™ Direct PCR Universal Master Mix. And what this allows customers to do is completely skip the DNA extraction step, so doing PCR from a crude lysate. So that's another area that customers and clients can actually save money and eliminate steps at the same time using our reagents. So they don't have to have that purified DNA. They can just go directly

into the crude lysate, because they only need a yes or no answer. They're not going to be actually using that DNA for any downstream steps,

Steve Lewis 23:23
Kind of like just a signal detection instead of full sample prep?

Cam Cyr 23:29
Correct. Absolutely.

Steve Lewis 23:31
Very interesting. Are there any other situations, or maybe cases that your customers have identified where performance is not as critical?

Cam Cyr 23:41
It really depends on the setting of the customer and what their eventual goals are. So, some examples of cost savings, you know, agarose, loading dyes, you know routine screening steps, like colony PCR, or maybe if you're doing a quick restriction enzyme check. Anything that, you know, the output is binary, like I've mentioned, that yes, no band on a gel readout, or if the rework is cheap. So, you also have to consider, “If I fail this experiment, or if something goes wrong,” which happens we all know it can happen, “how much is it going to cost to redo this experiment?” And if that output, or if that rework is cheap, that's where it's going to be really a good idea to be using those, those cost-saving mechanisms and those, those low-cost reagents. However, if the rework from using those reagents is going to be very expensive, you're going to probably want to opt in for the premium enzyme, or the premium product first. You can save $50, you know comparing one enzyme to the other. But if you have to repeat the experiment, you're probably going to end up spending more than that $50 that you saved.

Steve Lewis 24:52
If you had to kind of summarize the cost versus performance conversation, what would be the top three points?

Cam Cyr 25:02
My top three points would be when you're working with an experiment that errors can, that has errors that can propagate into constructs, decisions or expensive downstream work, opt for the premium enzyme. You know, search for the best enzyme that's going to get you to your goal, the fastest. On the flip side, if you're working, you know, in a space where failure is easily identified, it's cheap to redo, it's contained, such as genotyping, large colony screens, etc., that's where, you know, you can really save money and opt for the lower cost, less feature and benefit rich products to get you to your result. And lastly, I would suggest really reframing your mindset from cost per reaction, or price per reaction to cost per data point or cost per successful result. You can pay a lot of money and do a lot of research to not reach your successful result, and that's going to be all kind of a sunk cost there. But if you're using the right reagents that are de-risking your pipeline and getting you to the experimental results that keep you moving, you know that's going to be that's value inside of those reagents there for you.

Steve Lewis 27:22
Cam, it's always such a pleasure to get to connect with you. It doesn't happen as frequently as I would like, but I definitely want to take a moment just to hear your personal viewpoint on our two most frequently asked questions on this show. So, the first one is, what has been the key to your success?

Cam Cyr 27:43
That's a great question, Steve. I think that the key to my success so far has been putting people first. And that's, that's a mantra that I like to take with me, whether it's, you know, in my career, at my home, in my, you know, my hobbies. But if you put the people first and put other people's needs ahead of your own, a lot of the success will come. If you, if you develop yourself as, you know, a great teammate, and really champion yourself as a supporter of others, I think that a lot of success will find its way to you naturally, just because people will want to work with you.

Steve Lewis 28:21
If an emerging scientist is listening to this podcast, maybe they're just like yourself, in a academic lab and kind of, you know, kicking around certain ideas about where they might want to go with their career, what piece of advice would you give someone early in their career?

Cam Cyr 28:40
Try everything. You know, take the risk. There was definitely some risk. When I was leaving my PhD program at Clemson University. I didn't know where it was going to take me, but I did know that, you know, while it's early in my career, this is the time to try. So that's what my advice would be. You know, try everything. Find something that you're interested in. Find people that you're interested in working with and go for it. Your career may not be, you know, a straight line. And I think that's typically the best way to do it is, you know, squiggle around a little bit, make some pit stops in different places, and then you know, by the time that you're more established in your career, you'll have a trove of experience, trove of different stories, and you'll be able to be that much better of a colleague for the people you're working with later.

Steve Lewis 29:30
I love it, and you certainly are, Cam. Really appreciate your time today. Thank you so much for meeting with us and for all of the really interesting insights into customers and how they make purchase decisions. Really appreciate it.

Cam Cyr 29:45
Thank you, Steve. I really appreciate the opportunity.

Steve Lewis 29:50
That was Cam Cyr, Senior Technical Sales Specialist at Thermo Fisher Scientific. As always, please check out the Episode Notes for links related to this conversation. I hope you'll join us next time for more fascinating discussion about the wide world of molecular biology. Until then, cheers and good science. Speaking of Mol Bio is produced by Matt Ferris, Sarah Briganti, and Matthew Stock.