Episode 5 Transcript – Chad King

Michelle Jobin Intro Ep 5:
The fight against cancer can seem daunting and not everyone is lucky enough to win it. But we're learning more about cancer every day. And knowledge is power.

One day, we may finally defeat this terrible disease, which affects so many Canadians. In the meantime, we get to claim more and more new victories against cancer as we get closer to that goal.

Many of those victories start in a place few of us get to see: the laboratory. In this episode of My Time My Voice, we'll be talking with a cancer researcher who works in British Columbia.

We'll find out what the fight against cancer looks like from his point of view. I'm your host, Michelle Jobin, and our guest is Chad King.

Michelle Jobin:
So if we're at a dinner party and you're introducing yourself and describing a little bit more about what it is that you do, how would you describe things?

Chad King:
We really work at the first stage of the drug discovery process. Really starting from the idea for the drug, and then going off and finding drug candidates that could potentially fit that need. And this would be a long time before they ever can help people. But it's just that first step in the process.

How we go about that is we have very large teams focused on really specializing in different areas.

With what we do, we discover molecules that can basically help modulate cancer in different ways. We can discover molecules that may block an action. We can find a molecule that could stimulate an action, and we can also redirect the immune system using the molecules that we're able to discover and engineer.

And for example, the first thing we would do is partner with the therapeutic area. And in the therapeutic area, they have scientists that are really studying the biology and really understanding tumor biology and then potentially come up with proposals on how we could design a drug to target it specifically.

Michelle Jobin:
And how did you get into this line of work?

Chad King:

I entered industry early in my career. Starting with a very small company that was founded and spun out of the University of British Columbia. And that really hooked me. And from that company, we really got to touch a lot of things in the small company environment. And I just stuck with it. So just got intrigued by the opportunity to do drug discovery, and really have a hand in influencing the invention of new medicines.

Michelle Jobin:
In your day to day, how often do you think about the patients that you might be helping down the road?

Chad King:
We actually try to consider the patient in every step of the discovery process. When we're designing a new medicine, thinking about the potential benefit to patients, thinking about how we can deliver that medicine, in a convenient way to patients. And really making sure that we end up with something that creates really meaningful benefit for those patients in the end. So it's a constant theme as we're planning and really performing these projects that we do.

Michelle Jobin:
What would you say is the most surprising thing about your job?

Chad King:
When I think about it, something that would probably surprise people is the number of scientists and specialists, and people of all types that contribute to these projects to bring one single medicine to the market. And it's an enormous team effort, that to me just staggers me some days when I think about the number of brilliant people that are working on these projects in various different specialties, and every single one of them is key to one step or another in bringing this medicine to market. And so, I think that surprises me still to this day, as I learn more and more about the entire end-to-end process of going from a discovery at the bench to delivering that medicine ultimately to patients.

Michelle Jobin:
I'm getting a sense from talking to you and from our other guests that there is an incredible amount of time and experience and intellect on the part of yourself and other people that work in your field, and certainly a lot of money that is also invested into cancer research. What do you feel is the spark that really motivates cancer research?

Chad King:
People working at the front lines of doing discovery research in our labs are really pursuing the opportunity to invent a medicine that can really help make a difference in patient's life. And that meant motivation is clear, and it's a very strong driver for what motivates them every day to go in and work long hours and work weekends for that chance of inventing something that's going to make a difference in the end.

Chad King:
I think the reality is that everybody is now touched by cancer just because it's so prolific. The opportunity to invent a new medicine that can help patients is a really strong driver. And that is very motivating for individuals. We're trying to invent medicines that help people, and really at the end of the day that's the motivator.

Michelle Jobin:
For cancer researchers, what are the exciting developments in the field that you see right now?

Chad King:
I guess being in this field for over 20 years now, I've seen the methods being applied to that evolve dramatically and getting more and more precise. And we now have tools that we can apply very easily to profiling these features of tumors. Much more readily present day then than we have in the past. And so there's just huge amounts of information that can be generated now to mine through.

Chad King:
What we're attempting to do is design medicines that can treat cancer more potently and more durably. And that's really what we're trying to include in our early stage designs for these new medicines, so that they are targeted, and potent and have a bigger impact on the overall patient's health.

Michelle Jobin:
So I understand that genomes play a lot into what you do. Could you explain for us what a genome is and how decoding it might open avenues for cancer treatment?

Chad King:
The genome is basically the code of life and it encodes all of the genes and therefore all the proteins that your body uses. And the way we apply that in the oncology or cancer setting is we can use the genome of a tumor to really understand what's going on in that tumor. And that really helps inform us for how we can approach targeting that unique tumor based on its genetic makeup.

Chad King:
Tumors exist in the body and they have a remarkable ability to be invisible to the normal immune system. So they exist in your body and they're really unusual biology going on in those tumors. But your immune system doesn't see them as foreign or as a problem. And so what we're trying to do is redirect the immune system and target the immune system. The immune system has amazingly powerful ways to destroy tumors and tumor cells. But unless we target it and redirect those to the tumor itself, the value of the immune system is not really being fully exploited.

Chad King:
So our focus is human monoclonal antibodies.

An antibody is a protein and they naturally occur in your own immune system, and they can be raised against foreign pathogens. So when a pathogen enters the body, part of the adaptive immune system is to raise antibodies and clear that pathogen. We generate monoclonal antibodies, which is one antibody that binds to one specific thing. And we have variety of different ways of generating fully human versions of monoclonal antibodies that can then be characterized for the functions that we're looking for.

Michelle Jobin:
Now, according to Innovative Medicines Canada, it takes about 10 to 15 years for a treatment to go from discovery to the market. How are you working to accelerate this process?

Chad King:
Well, this is actually something I focus on a lot. And how we can optimize and improve what we're doing to accelerate development and discovery. So I can think of a few different areas that I can tell you about. One is that we are trying to miniaturize our technologies. Our group has pioneered the use of single cell technologies to do antibody discovery. And what this allows us to do is really evaluate a lot of antibody candidates or drug candidates in parallel. And then reiterate our screening to find antibodies with extraordinary properties. And that really requires us to cast a very wide net and search for antibodies that are very rare or sometimes miniaturizing our technologies leveraging nanotechnologies really helps us accelerate our throughput and characterize even more candidates very quickly.

Another aspect of what we're trying to do to accelerate is ultimately the candidate drugs that we generate and discover, will have to go on to a manufacturing process. And so the proteins that we discover aren't necessarily well-suited sometimes to that manufacturing process. So what we do, is we spend a lot of time up front trying to understand the molecules, and how they're going to behave during the manufacturing process, because it really doesn't help if we discover an amazing molecule that just can't be made. And so we try to predict that and avoid failures later so that we can move those molecules once we have interesting molecules, we can move them quickly into larger scale up and clinical testing.

And we heavily leverage data sciences as a predictive tool. One aspect of that is really trying to model in advance what we want a drug to do when it goes into the human body. And we can do that in advance to really help guide the way that we screen for drug candidates. And that informs what we're looking for, based on what we actually want that drug to do when it's in the human body. And so, again, the better we can model what we want it to do later, the better we can design a way to find those molecules and get through to them very quickly.

Michelle Jobin:
And could you maybe elaborate a little bit on how your team does identify molecules and antibodies to investigate and evaluate in the first place? How do we arrive at that point?

Chad King:

The research organization is somewhat distinct from the clinical organization, and we do a lot of basic characterization and data generation and try to leverage that in the discovery stage, obviously the clinical data, if it's available, it will inform that as well. And we always partner with our team members from the clinical side to make sure what we're doing makes sense to them as well. But we do in the discovery side generate a lot of our own data.

Michelle Jobin:
So if I'm a doctor or another kind of healthcare provider listening to this podcast right now, is there anything that I can do to help people like you and the work that you do?

Chad King:
Well, of course the doctors are essential partners in discovering new medicines. The clinical trials that need to be run that prove efficacy and safety of our new medicines are led by doctors out there in the field. And of course, the willingness of patients to subject themselves to clinical trials and the testing of new medicines. So on both sides, this is just an invaluable part of the discovery process.

Michelle Jobin:
If a young person listening — or maybe even not so young, you never know — wants to become a cancer researcher, what should they study now if they're going to university?

Chad King:
I would think that the successful researchers in the future are going to be highly multidisciplinary, and that could be the merging of really deep biological understanding with the ability to leverage data science for example. And it's the merging of these specialties that we really need people to excel in to fully exploit. For example, the power of data science, which is a very growing field…

Data sciences is going to be a very powerful skill in the future. And the more that can be integrated into biological research, the better. So, specialization in data sciences will absolutely be valuable.

Michelle Jobin:
Fantastic. Chad, I appreciate you being here to speak with us today.

Michelle Jobin:
And I think during the process of talking to you and our other guests on the podcasts, I definitely get a sense people should see really or get a sense of the individuals that put so much of their time and their effort and their hearts into what they do. Really there's some incredibly wonderful people that I've had the chance to talk to you like yourself, that put so much time and effort into this very important cause.