



20 Questions with... Tim Caulfield

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20 Questions with 20 Stem Cell Scientists from Across Canada

1. Where were you born? Where did you grow up?

I was born in Cape Cod and grew up in Mystic, Connecticut, USA. My high school years were here in Canada – right here in the Edmonton area – so I very much consider myself a Canadian.

My dad is an Engineer/Physicist, and he was doing work up north, so he moved our family to Canada, and we settled in Edmonton – the biggest city close to where he was working. There is quite a big difference between Cape Cod, Mystic, Connecticut and Edmonton, Alberta. I think it was a definite shock for my mom!



Tim Caulfield

2. Where did you go to school?

I went to Salisbury Composite High School in Sherwood Park and then did my undergrad in science at the University of Alberta (U of A).

I've always been fascinated by science and also been attracted to the policy world. I decided to go into law with a hope of combining my interests.

And as with so many trainees out there my life changed because I had great mentors. When I got to Law School at the University of Alberta, I met people who worked with the Health Law Institute and it was like a light went off. It was really one of those rare moments in my life where I got this incredible clarity and certainty that this is what I wanted to do. I honestly feel very fortunate because I don't think this happens for everyone. I got to the Institute and just knew that this is what I wanted to do with my life.

But probably even more importantly, and this is something that I have tried to embrace and model in my life, is that I had these mentors. This allowed me to almost immediately fulfil that dream. Those people included [Justice Ellen Picard](#), [Gerald Robertson](#) and later, [Bartha Maria Knoppers](#).

From very early on I had these fantastic mentors and it has been so key to my career.

I did a Masters in Law at Dalhousie University and my original plan was to take the more conventional law professor route – teach, do health law in a very kind of traditional way, and publish law review articles etc.

But my first academic job was working with Bartha (Knoppers) and her impact as a mentor was so significant for me. She does these big interdisciplinary projects and she very immediately made me realize the possibilities and that you could combine your passions – doing empirical work and work closely with scientists – and take a more unconventional path.

Bartha is one of the early legal scholars, not just in Canada but internationally, that has championed the interdisciplinary approach. She has pushed the idea that not just legal scholars but sociologists, anthropologists, artists – you name the discipline – can all be active partners in a bigger team. This is something that SCN also embraced early on as an institution and has been a world leader in supporting interdisciplinary research approaches.

3. What did you want to be when you grew up?

A rock star. In high school, I was all in and serious about becoming a rock star. But my mom kind of tricked me.

She was always so supportive of me. She told me that if I wanted to be a musician that was awesome, but she convinced me to just finish a university degree. I think she knew that once I got into university and was exposed to all the learning opportunities and became part of the community that reality would set in. She was one hundred per cent right.

Of course, being a musician is a tough way to make a living. It is not an easy thing to get well paying, regular gigs. On top of that, I get car sick very easily – all that driving from small town to small town – I just hated it.



The life of a rock star

4. What are you researching right now?

We continue to do a lot of research on public representations of science and health. It's something I've been fascinated with and has been a big part of my career since the late 90s.

Currently, we're doing a lot of work on the misrepresentations in the context of COVID-19. The amount of misinformation is just breathtaking in this space, so we've been doing a lot of work there. We have a lot of really cool initiatives that we're working on to try to help Canadians find the right information, and we're working with the Public Health Agency of Canada on a big initiative.

We are also working in precision medicine in the context of transplantations and looking at the legal and ethical issues.

We are also examining how the microbiome is being represented in the public sphere. That project really builds on the work that we've previously done in the stem cell space where we looked at the marketing of unproven stem cells, the hype around stem cells, and the adverse impact that can have on public perceptions, and people buying improving therapies. The same pattern is starting to unfold with the microbiome. There are all these unproven microbiome products out there and microbiome language is used to sell unproven products. They are leveraging the good science that is going on in microbiome research – this is the exact same thing that has happened in stem cell research. So, we are drawing on the lessons that we learned from our stem cell work and applying it to the area of the microbiome.

It is so unfortunate because it is just taking advantage of people's desperation. There are so much unproven therapies out there and a lot of people are marketing this stuff to individuals with serious diseases and exploiting them in order to sell to them and make a profit. It's so harmful to the science because I think it hurts public trust and creates unrealistic expectations. We call it 'scienceexploitation' – where you take a legitimate area of science, like stem cell research, and the excitement that is represented in the public sphere and exploit it to sell unproven therapies.

We have even found in some of our work with the Stem Cell Network that people will even just use the language of stem cells to sell stuff that isn't even related to stem cells. They just want to leverage that excitement that emanates from this legitimately interesting area of biomedical inquiry.

Going back to our COVID-19 work, the good news is that because of some of the influences, like Donald Trump and all of this nonsense around vaccines and other unproven treatments, there is a great appreciation and greater attention now being given to how science is being represented. I think this has helped our field. More people are very much more sensitive to the impact of misinformation and my field is now being taken much more seriously.

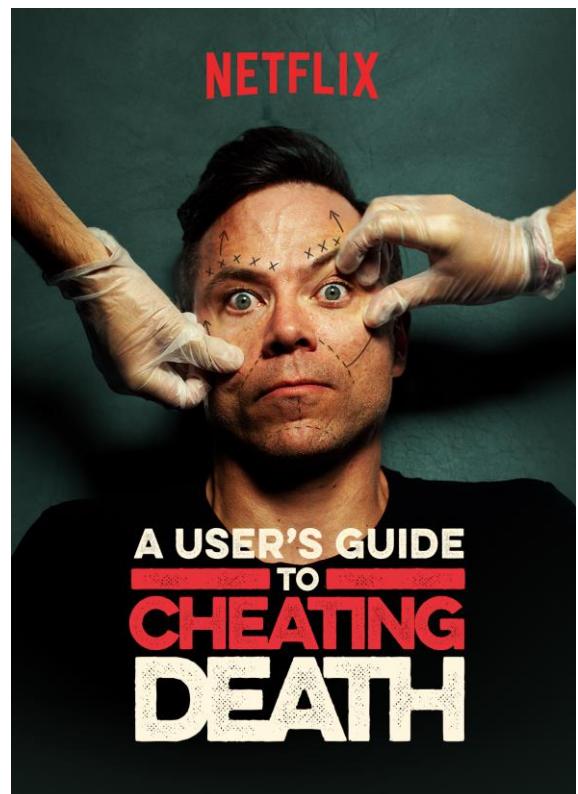
5. What attracted you to stem cells?

It is just a fascinating, incredibly promising area of research, and it continues to be. It's also a really good example of how science can be, big science, and how big science can be done.

One of the reasons it really drew me in is when in the late 90s, early 2000s – this was right when my career was getting started – you could make an argument that stem cell research was amongst the most controversial fields of science in the last 100 years. It was primarily because of the concerns about the moral status of the embryo, but also how reproductive cloning was being layered on top of that, and other serious questions such as, how you can control your own cells, on top of that. It brought up a lot of really interesting and complex legal, ethical and social dilemmas.

In addition to that, there are a lot of interesting issues around representations of science. How stem cells are represented in pop culture, for example. It is this fascinating component to how we all think about stem cells, think about science, and think about biotechnology in our lives.

Consider, for example, how cloning and stem cells are represented in movies, cartoons and books. This shapes how we think about this field, and there's even interesting research that suggests that it shapes even the kind of research that we do. So, there's this interesting feedback between pop culture and science, and public perception. It is a really interesting interplay and I continue to be fascinated with that.



*Taking on unfounded pop culture
beauty myths*

6. Who in your opinion, are the top three Canadian stem cell researchers in history?

I can't name just three!

Janet Rossant is a huge influence in the space. I really admire her approach, not just to science, she is so thoughtful. She is always so good about looking at things in the broader context. That kind of reflection I think is probably needed more now than ever.

My colleague Bartha Maria Knoppers has been such a huge mentor to me.

Michael Rudnicki is a wonderful leader, in addition to being a great scientist.

I could go on and on listing my Stem Cell Network colleagues. There are too many to name. It is a fantastic, collaborative, and fun community and I am so grateful to be part of it.

7. What is the most significant stem cell discovery or advancement over the last 20 years? The last 60?

For 60 years, you have to go with the Canadian discovery of stem cells.

I would say the discovery of iPS cells for the last 20 years. Not only was it a big scientific discovery, but it also because it shifted how, from a socio-political perspective how we talked about stem cells. That was fascinating. And even though

the advances have been iterative and slower than people initially thought, it really has changed how we think about the kind of work that we can do in the area of stem cells.

I would also have to include cloning as a third important discovery. I am cheating a little as it is not full-on stem cells, but it is so relevant. I am thinking of reproductive cloning, like Dolly the sheep. It is just so fascinating from a cultural perspective, how the world responded to Dolly. There was just so much hyperbole and fear mongering associated with that discovery. It was a fascinating moment in the history of science because if you think about it, I won't say it was a dud, but it was really much ado about nothing, but still the legacy lingers. Of course, there is scientific application, therapeutic cloning, somatic cell, nuclear transfer, are more broadly very interesting technologies. But I think that the ripples that emanated from Dolly the sheep are still there.

In one of my classes, I teach about cloning. I ask the students to name a movie that portrays cloning in a positive light and it is always a hard one to answer. It has always been portrayed, right out of the gate as evil. And this has had an impact on the laws around it. Every country that has thought about regulating human cloning has banned it – in Canada it is a criminal offense. Is that a conceptually consistent idea? No, but it is because of the hype surrounding it. And I am sure that pop culture informed that public dialogue and also the policy development.

8. What are your predictions for stem cell advances in the next 5, 10, 20 years?

I am a little cautious. I think we are going to see iterative advances. I am hopeful that things like iPS cells are going to result in therapies in areas like diabetes. I am quite hopeful that we are really starting to signal in that direction. I don't know if it is five years, I think we are talking probably 10 years and out.

And looking to my field, I am also worried that we are going to continue to see the marketing of unproven stem cell therapies. Every single time there is a real advance in the field, we are going to see these providers trying to exploit that advance in order to sell improving therapies.

My positive prediction is I think regulators are becoming much more sensitized to this issue. I am hopeful we are going to see more action from entities like Health Canada and the FDA (in the United States) trying to stop the growth of these unproven therapies.

With COVID-19 it was incredible how quickly providers around the world were talking about stem cell-based therapies for COVID without good clinical evidence to support those claims. Unfortunately, I think this is going to be a continuing theme five, 10, 15 years out.

9. What are you reading right now? What is the best book you ever read?

I am reading a book on Franklin Delano Roosevelt (FDR). It is *called No Ordinary Time: Franklin and Eleanor Roosevelt: The Home Front in World War II*, by Doris Kearns Goodwin. This author is an amazing historian.

I always have a number of books on the go at the same time, so I also have some good, old school sci-fi going right now. I am reading *The Salvation Sequence Series: Salvation, Salvation Lost, The Saints of Salvation*, by Peter F. Hamilton. It is a big space opera kind of thing. I am coming to the conclusion (of the trilogy) and the entire galaxy is at war, so you know, this is big stuff!

For the second part of your question, I am going to say *The Guns of August* by Barbara W. Tuchman. Now I can't say it was the best book I ever read, that's ridiculous. That's like asking what's the best song – it's an impossible question. But that book made me want to be a writer. I read it quite early in my life and it really enhanced that desire to learn. It was one of the first books that made me realize how enjoyable learning about a topic can be.

10. Who is your favourite scientist?

Charles Darwin. I have Darwin's finch as a tattoo on my arm. I also love the Wright Brothers.

I love these scientists because – and this goes back to what I was saying earlier about Janet Rossant – they are so humble. With them, it is just all about the data.

Think about Darwin, he just plugged away, and it was just really all about the science. But his work, it changed everything.

11. What in your opinion is the single most important health science or biomedical breakthrough?

Vaccines. You could talk about sanitation, germ theory, but I picked vaccines because they save millions of lives every year. It is one of those genuine, paradigm shifting, biomedical discoveries.

So often that kind of language is used, but it really is. Vaccines are a biomedical intervention that really did revolutionize our world. There are really not many breakthroughs that have had that kind of impact.

I have asked my classes to define a breakthrough and then challenge them to name 10, over the last 100 years. It is not easy to come up with more than 10. Science is such a slow, hard, messy, iterative process. Those huge breakthroughs are pretty rare.

12. What are your hobbies outside of the lab?

I am an exercise fanatic, cycling in particular. I enjoy road cycling and I go on the velodrome and do track cycling and sprint cycling. I really love the velodrome – it is pure cycling. I even did some competing. I was a sprint cyclist and went to the Master's Games and went to the UCI (Union Cycliste International) Championships in Manchester and did all right. I also did some road racing but it is very time consuming. I see us doing more of that in our future – my wife enjoys road cycling too and we ride together when we can.

Music is still big part of my life.



Competing at the UCI Championships in Manchester

And I am a little bit of a movie fanatic too. I love all movies – cheesy big, blockbuster sci-fi movies, I love horror movies. I am really fortunate in that the majority of my four kids are also into movies as well.

We are super lucky because our kids have very similar interests so we are able to enjoy a lot of these things together as a family.

13. What is your favourite place to visit? Why?

Poland, Krakow. We were planning to go to Slovenia for the summer, until the pandemic hit. The history is fascinating, the architecture is really cool, the food is amazing and the people are really fun. And the beer is good too.

I also really love Helsinki. It is also one of my favourite cities in the world. I was lucky to be a visiting professor there for a bit and I love it. We got super lucky while we were there because the weather was incredible – blue skies every day. It is an amazing city and the people are so fun.

We used to go every summer to a new place. I would go be a visiting professor someplace and I would bring the family with me. We could just stay in a bed and breakfast. Now, I treat it like a writing retreat, not tied to a professorship, and we just choose somewhere to go each summer.

14. What is the best way to start your day?

A beautiful bike commute to a hipster coffee shop with overpriced espresso. I open my laptop and do some writing.



Living the café lifestyle

15. What are the top three songs in your personal playlist? What is the guilty pleasure song on your playlist?

This is a hard one, but I would call these three a safe representation of my all-time favourite songs:

- *London Calling*, by The Clash
- *I Want You Back*, by The Jackson 5
- *God Only Knows*, by The Beach Boys

My guilty pleasure would be *Dynamite*, by BTS.

16. What advice would you give to a trainee just starting out?

First of all, you have to love it and appreciate how fortunate you are to be doing something that is interesting.

Say yes, a lot. You need to take advantage of those opportunities that are presented. It is going to feel overwhelming at first, but I think it is really important.

Make sure you look for those mentors that can help you and give you advice. Even if it is just a little bit here and there, it is important. It really had a big impact on me.

17. What skill would you most like to master?

I wish I was a better musician. I know that sounds ridiculous given the fact that I wanted to be one. And particularly given how much time I have devoted to playing the guitar and other musical instruments, it is remarkable how bad I am at it. I think I am a pretty solid songwriter – I am pretty creative. But I am such a bad musician, and I can't express myself.

I have worked with some really talented musicians and what they can do with their instruments, it is like magic to me.

18. What website do you visit most often?

It is probably a tie between Rotten Tomatoes and IMDB. I go back and forth a lot, looking at any kind of pop culture reference.

19. What is your favourite word? What word do you use too much?

Bakery. It is such a great word. It sounds great, it evokes beautiful memories, and you can smell it. You just say the word bakery and you can smell a bakery.

The word I use too much is 'absolutely'.



In the spotlight

20. What takes up too much of your time?

Email and social media.

Every new year's resolution I promise to get more focused on not letting email and social media consume my life. Increasingly though, social media is becoming part of my job, so it is hard not to get sucked into that vortex.

In my book, I have a whole chapter about email. It is incredible how much it consumes people's lives. I joke, that if you are in a big city and you see a crowd of people, you are looking at a crowd of email answerers. That is how they spend 6 to 8 hours a day – answering email. That is what humans do.

