20 Questions with… Sepideh Abbasi

Postdoctoral Fellow, IRCM (Montreal Clinical Research Institute) & McGill University, Experimental Medicine Department

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

I was born in the province of Fars in Iran and grew up in Shiraz, also known as the City of Roses and Nightingales, a very poetic and green city that is famous for its poetry.

2. Where did you go to school?

Both my parents are teachers, so I was always involved in reading and interested in learning more. I started school at a young age and ended up graduating two years younger than the rest of my classmates.

In Iran the school system is different, the last year of high school you have to take a national exam and based on your score the system will match you with different programs. With my matches I chose veterinary medicine (which is a seven-year program) at Shiraz University.

I finished my D.V.M degree in 2007, and got accepted into Cornell Veterinary School to do a postdoc, but because of political issues between Iran and the U.S.A. I was unable to get a visa and then started looking into Canada.

Abbasi Family

I went to the University of Saskatchewan Veterinary School (WCVM) for my Masters in Reproductive Biology and then came to Calgary in 2010 for my PhD in Jeff Biernaskie's lab (UCVM) that focused on hair follicles stem cells and skin regeneration.

In 2018, I moved to Montreal for my postdoctoral fellowship at Montreal Clinical Research Institute (IRCM) and McGill University in Michel Cayouette's lab which is a retinal biology laboratory.

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

Besides art, literature and poetry which my family and I have always been interested in, science also interested me.

I was 14 when Dolly the sheep was born. I remember sitting in front of the TV watching the Science News program about Dolly and I thought, 'oh my God', this is what I want to do! I was just so fascinated by transgenic animals and a few years later I got into Shiraz University, School of Veterinary Medicine working with animals.

4. What are you researching right now?

The main focus in our lab is retinal biology, we are studying different cell types within the retinal and the developmental aspects of these cells. We are trying to understand how the fate of various cell types within the retina is altered over time. The overarching question is how to build and rebuild the retina.

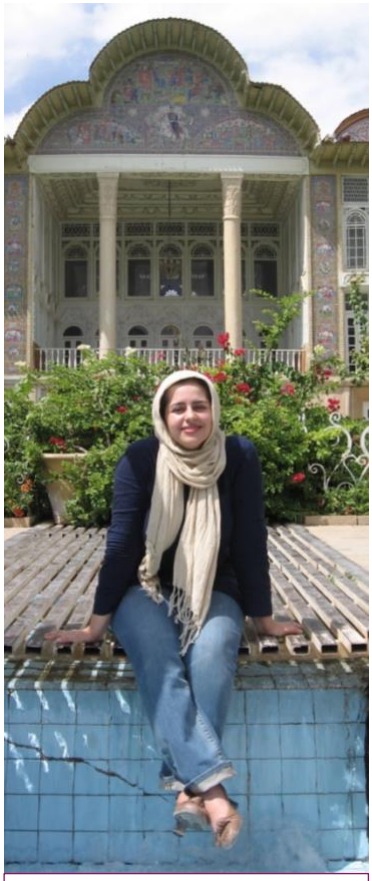
My work is a follow-up on research that was published four years ago. It was shown for the first time in mammals that there are some cells in the non-neural epithelial part of the retina (where the retina attaches to the lens) that are bipotent progenitor cells and are able to give rise to some of the neurons in the retina, in addition to the specified epithelial cells that are residing in that compartment. Also, this only happens during embryonic stages.

Now that we know those cells exist, I am now researching how those cells function and what are their roles in terms of regenerating the retina, a phenomenon that usually happens in the lower vertebrates like zebra fish. And, to understand why this biopotency only exists at the embryonic stage and not in adults.

5. What attracted you to stem cells?

The endless possibilities.

I miss working with animals, but I continued to work in stem cell research because even though sometimes it's a love-hate relationship when things start working, it opens so many doors and possibilities. I also thoroughly enjoy learning about different types of stem cells.



Shiraz, Iran

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

Well of course, Jim Till and Ernest McCulloch, the stem cell pioneers and aside from them, I would have to say:

Janet Rossant, who I first met in Calgary at a Meet the Expert's breakfast table session in 2010. She was just so fascinating, and I've learned a lot from her published work and by attending her presentations over the years.

John Dick, every time I've attended a presentation about his work, I am always so captivated about the progress and impact of his research.

Fabio Rossi, a very intelligent researcher whom I've had the pleasure to collaborate with.

Guy Sauvageau, the science that he is doing is just outstanding and the care he has for his patients is amazing, which I have witnessed in a presentation he was giving with a patients advocate at the ISSCR conference.

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

For the last 20 years, definitely iPSCs. The Yamanaka factors opened many doors of possibilities and enabled us to overcome limitations. As well as, with the ethical issues that surround the use of embryonic stem cells.

For 60 years, the whole discovery of stem cells and embryonic stem cells, again the possibilities and the use of them for therapeutic purposes.

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

That is difficult, I am a cautious person, especially when it comes to stem cells.

In the next five years, I would say the use of organoids and single cell RNA-seq will give us a lot more information and understanding of how different organs develop, especially with single cell RNA-seq, the heterogeneity of different organs and time points.

I think assembloids [organoids generated by spatially organizing multiple cell types] will evolve in the next five to ten years, especially for disease modelling and drug discovery and screening.

In the next 20 years, I really hope we can have some answers and therapies available for advanced diseases like diabetes, cancer and MS.

9. Who is your favourite scientist?

Marie Curie.

When I was 10 my parents got me a book about Marie Curie. I used to daydream to be like her as a child.

10. What would you describe as the most significant moment in your own research career?

In my last PhD project, I was working on large wound healing in mice. If you make a large wound on the skin of mice, you get growth of hair follicles in the centre of the wound, however, if the wound is small just a hairless scar tissue will form and this happens to burn patients as well (regardless of the size of the wound). Skin grafts in these patients will lack the hair follicle which will cause issues such as, being too hot or cold, dryness and itchiness.

In early 2016, I was using Hic1:TdTomato mice to study these large skin wounds; when I looked at the healed wounds under the microscope, to my surprise, almost all cells within the dermal compartments of the nascent hair follicles in the centre of the wound were glowing red. This meant that the majority of hair follicles within that regenerative section were coming from the Hic1 cells. That was the beginning of an amazing project and collaboration, which was recently published in Cell Stem Cell.

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

I just started reading Franny and Zooey by J.D. Salinger.

The best book, I've ever read I received on my 13th birthday from my mother, The Gadfly by Ethel Lilian Voynich. It's a book about the culture of revolution, love and fighting for what you believe in.

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

Two things, the discovery of antibiotics and vaccinations. I can't imagine how many lives have been saved because of these discoveries.

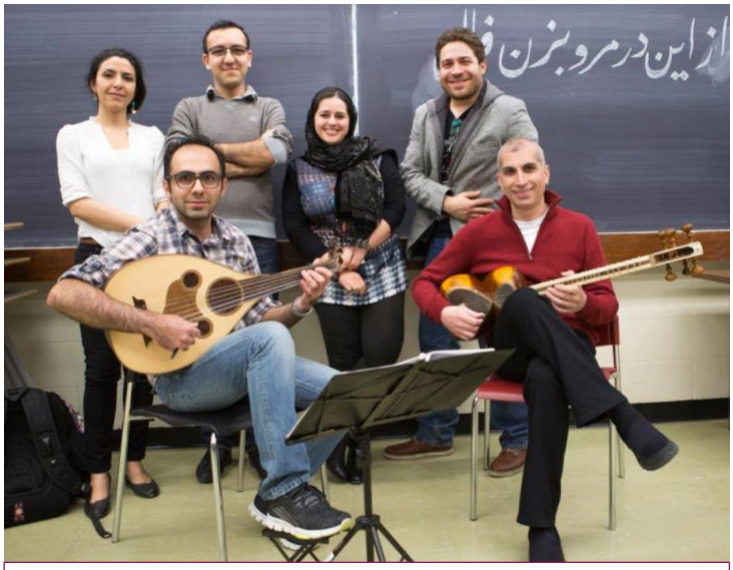
13. What are your hobbies outside the lab?

If I have time, painting, which I have done ever since I was a kid. I first began using oil, pastel or colour pencils as a teenager, and now use acrylic or water colours when I paint.

I am also very interested in literature and poetry, which is in my blood from family members and coming from Shiraz which is quite a poetic city. I started recording poems and short stories in Farsi (as a short audiobook) for the Persian Student Association in Edmonton at the University of Alberta, which they post on their website, Gahshenood.

14. If not a scientist, what would be your dream job?

I would pursue, literature, poetry and painting. I would also like to work as a veterinarian or a marine biologist.



Persian Poetry and Music Night

15. What job would you be terrible at?

Mathematician.

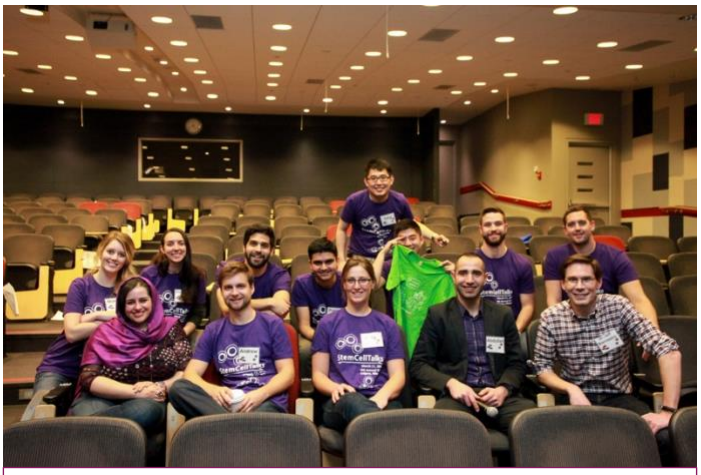
16. What skill would you like to master?

Bioinformatics and get better at painting.

17. What is your favourite movie?

The Before trilogy; Before Sunrise, Before Sunset, and Before Midnight.

18. What is the best piece of advice you have ever been given? What advice would you give to a trainee just starting out?



Calgary StemCellTalks 2016

When I was finishing my Masters, it was a stressful time, I was under a lot of pressure and recently had a surgery. There was a candidate for Dean of the Veterinary School in Saskatchewan, that came to visit, and I asked him for advice with my current situation and he quoted Churchill, "if you're going through hell, keep going." It resonated with me, meaning don't give up, there will be an end.

For trainees, I would suggest a few things. One, don't go crazy with spending time on the bench when you just started, first read the literature and all the background work, it will help you plan and design your experiments much better. Second, take care of your mental health, and stand up for yourself when you need to.

19. What is something you think everyone should do at least once in their lives?

I was recently thinking, I was only 24 or 25 when I came to Canada alone, and didn't know anyone. I had to start from scratch but became stronger and more independent in a way.

If possible, I would recommend someone to go live somewhere else for a period to experience and learn about different cultures and how to build a little community for themselves.

20. Who is your favourite Canadian?

Leonard Cohen and the Levys (Eugene and Daniel).