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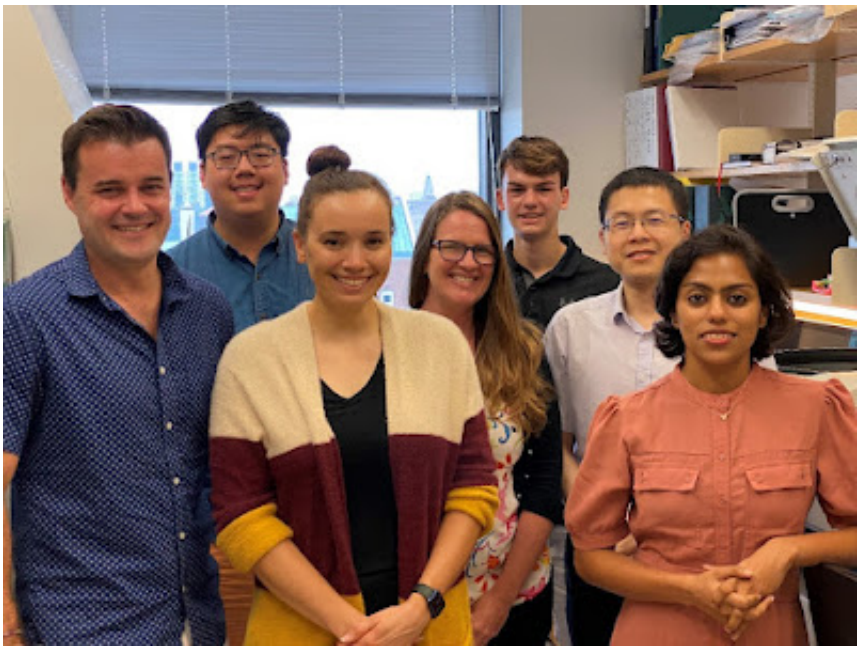
Deconstructing Blood Cell Research
Building the Hematology Community

Lab Spotlight: Sturgeon Lab

- October 06, 2022

Each month, Simply Blood spotlights a lab focused on the research of basic hematology, immunology, stem cell research, cell and gene therapy, and other related aspects. Get to know these different labs around the world! This month, we are featuring the Sturgeon Lab (www.sturgeonlab.com) at the Icahn School of Medicine at Mount Sinai located in New York City, New York, USA.



Sturgeon Lab at Icahn School of Medicine at Mount Sinai, Twitter: @Dr_Sturgeon

How long have you had your lab?

I first opened my lab at Washington University, in March of 2014. We then moved to Mount Sinai in New York in August of 2020.

What was your biggest transition from a post-doc to a group leader/lab PI?

Or what do you miss most from your post-doc time? *I remember being so overwhelmed and star-struck just seeing, for the first time, the space that was going to be my lab. So much so, that I forgot*

*to ask key questions about how things like renovations could be handled, HVAC and electrical limitations on equipment, space/growth limitations, etc. All I could think was "I *actually* made it!". I'll never forget that feeling. As a postdoc, you're often hyper-focused on the experiment in front of you, the data you have, and the next experiment to do. Once you're a PI, not only do you have to have a "big picture" point of view on a project, but on multiple projects, *and*, non-science things like budgets, administration, grants, managing trainees, and committees. Sometimes I miss the days of only worrying if my experiments work!*

What was the most exciting part about starting your new lab?

Sitting down with a pen and paper, sketching out your lab space, and figuring out where you'll put an incubator, a biosafety cabinet, centrifuges, freezers… it sounds so silly, but that was unbelievably exciting. And then once it's all there, you thaw cells for the first time, and they grow. It's such a relief, even though it's the most basic thing you've been doing as a postdoc for years prior, now you're doing it with your own reagents, in your own lab – and it all starts to be clear, things are going to be ok!

What is the major research theme of your lab and what is the most exciting project in your lab right now?

We are focused on understanding vertebrate embryonic hematopoietic development, and recapitulating those processes in human pluripotent stem cell differentiation cultures. Our work has really brought an emphasis to early differentiation stages – like really early, during gastrulation-like stages of the cultures. By modulating the critical signal pathways WNT, BMP, NODAL, or RA, we obtain quite distinctly different hematopoietic progenitors. Right now, one project I'm really excited about is exploring the adoptive immunotherapy potential of these different progenitors. Do embryonic progenitors have "untapped" clinical potential, that we just haven't realized because they aren't found in traditional donor sources? And if so, could pluripotent stem cells be that source? For so long, we as a field have been obsessed (and rightly so) with identifying a method to differentiate pluripotent stem cells into hematopoietic stem cells. But what if an HSC-independent progenitor, which we are often tossing aside in that quest, actually has some clinical utility? I think this is a really exciting question right now.

How many members make up your lab? Students/postdocs?

We are a relatively small group right now, but are always looking to add more. Right now my lab is comprised of 3 postdocs, 1 technician, 1 lab manager, and a summer student.

How important was mentorship to you during the early stages of your career and how do you

mentor trainees?

It goes without saying that I would have never made it here without the mentorship of my postdoc supervisor. But when I first started my lab, I didn't have a formal mentor structure. In retrospect, certainly it would have helped me, but instead, I did my best to seek out colleagues who could provide me with honest feedback on grants and lab management, which are the things postdocs have the least experience with. I am forever indebted to those who helped me along the way. Now, in my own lab, I first try to understand what my trainees' career goal is – as a simple example, industry or academia. From there, I do my best to try and formulate a project together that will make them competitive for that position – and that can take on many forms. There really isn't a magic formula, each person responds to feedback in different ways. But we make a point of meeting once a week to discuss anything ranging from data, project planning, and career goals.

What is your lab's most recent accomplishment? And how do members of your lab celebrate accomplishments? Or does your lab have any fun traditions yet?

We just had a series of papers published this year, in Development, Stem Cell Research, and Nature Cell Biology. For each, we have a little tradition that I actually stole from my PhD advisor - we pop a bottle of bubbly, and let the cork make a dent in the ceiling. The first author of that paper signs the ceiling next to the dent, and then we all enjoy that bottle (and maybe some more). I keep the cork, and put it in a big jar. My goal is that by the end of my career, that jar will be overflowing with corks!

What do you like most about your current institution?

I'm now part of the Black Family Stem Cell Institute here at Mount Sinai. We are a diverse group of stem cell and developmental biologists – which I absolutely love. In our faculty meetings, there is such a wide variety of perspectives, which I think is going to really benefit our research in the long term. Fly, fish, frog, mouse, and human iPSC, we have it all here.

What major advances do you predict in your research field in the next 10 years?

Oh, there is so much to be excited about! I think we're going to see an explosion in hPSC-derived immunotherapies. NK cells are already in the clinic. CAR-T cells, B cells engineered to produce specific antibodies, probably even macrophages, are all going to be in use. But like I mentioned above, there's been such a long-standing focus on how HSCs develop, I do believe as a field we are poised to see that finally come to fruition. And regardless of which group(s) do it first, it's going to be a really exciting time for all hPSC groups, because now we will have a platform to do some really powerful developmental biology.

What is the most beneficial aspect of ISEH membership for you/your lab?

> *ISEH is, without a doubt, my favorite society. The meetings have a perfect balance of adult hematopoiesis, disease processes, embryonic development, and pluripotent stem cell differentiation, so every session is really just a "can't miss" event. I always feel inspired on my way home after each meeting.*

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*Blog post contributed by: **Charmaine Soco**, ISEH Publications Committee*

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- *November 14, 2024*

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