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First person – Brittany Seman

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping early-career researchers promote themselves alongside their papers. Brittany Seman is first author on 'Neonatal low-density granulocytes internalize and kill bacteria but suppress monocyte function using extracellular DNA', published in JCS. Brittany is a postdoctoral fellow in microbiology in the lab of Dr Cory M. Robinson at West Virginia School of Medicine, Morgantown, WV, investigating host–pathogen interactions in the context of infectious diseases.

Brittany Seman

How would you explain the main findings of your paper in lay terms?

My work focuses on trying to characterize the low-density granulocyte (LDG) in its ability to directly affect an infection, as well as its ability to affect other immune cells during an immune response to an infection. These cells have a wide range of names in the field because they are not easily isolated from other cell types, and their function seems to depend on whether they come from an adult or neonate, the type of infection (microbe-dependent), and whether the person the cells come from is sick with an underlying condition or is relatively healthy. In our study, we wanted to try to characterize how neonatal LDGs specifically function during a bacterial infection with a pathogenic strain of *E. coli*. We found that neonatal LDGs are able to eat up the bacteria and kill them, but they are not nearly as good at these functions as are other professional pathogen eaters (phagocytes), such as the monocyte. In addition, during infection, these LDGs release DNA into the extracellular environment, but this extracellular DNA (eDNA) does not seem to affect the viability of the bacteria. Instead, the eDNA seems to inhibit the ability of the monocytes to take up and kill bacteria, and the addition of an enzyme that inhibits eDNA formation restores this ability. Overall, this data allows us to further characterize these LDGs during infection and their effects on the immune response during such an infection.

Were there any specific challenges associated with this project? If so, how did you overcome them?

The last leg of my project worked around trying to get data and experiments done during the 2020 COVID-19 pandemic, which I think caused issues for almost every lab in the world. That being said, our lab was able to make schedules so that we could go in at different times during the day to get our work done. Our work got done a little more slowly, but obviously it paid off. In addition, during revision of the manuscript, I myself acquired SARS-CoV-2 and had to isolate for almost 2 weeks before I was able to come back to the lab and get my work done. With all these time constraints, we still made this work happen, by getting human blood samples multiple times a week to get more experiments done at the end.

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When doing the research, did you have a particular result or 'eureka' moment that has stuck with you?

I think the surprise of finding the eDNA, and then finding out that it didn't really kill bacteria like we thought it would (in the context of neutrophil extracellular traps), was absolutely cool. Additionally, just imaging those infections and seeing the eDNA throughout the infections was one of the coolest parts of the experiments I did for the paper.

Why did you choose Journal of Cell Science for your paper?

We chose the journal because it is well known within the biological sciences, but also this particular journal was having a host–pathogen interaction special issue we wanted to contribute to, as we thought it would showcase our work in a wonderful manner.

Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

Obviously my postdoc mentor, Cory, has done a wonderful job of helping me throughout my postdoctoral career. In addition to Cory, I have also worked with a neonatologist, Dr Stephen Matt Akers, who helped our lab tremendously to be able to obtain umbilical cord blood donors from the hospital next door to our lab. He is also a co-author on my paper because of his great mentorship and his thoughts on the data throughout the entire process. His experience on the clinical side also gave new thoughts to add to the article, and his help has been greatly appreciated.

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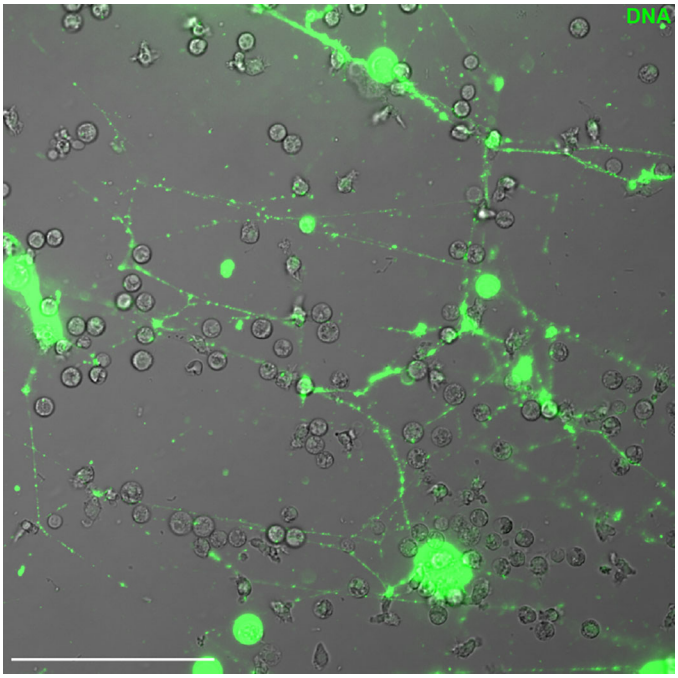

Looking into a beautiful magnified world.

What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

I have been in and out of hospitals (NIH) since I was about 1 year old because of a rare genetic condition I was born with. Because of this clinical exposure, I always knew that I wanted to go into the biomedical field. When I took a microbiology course in my sophomore year of college, I fell in love with microbes. I started working in a lab as an undergraduate and learned that I absolutely loved bench work and that I wanted to become a research scientist. I am grateful for my PhD experience working on fungal pathogens in larval zebrafish, and grateful that my postdoc mentor gave me a chance to work in his lab studying bacterial pathogens in mouse and human immune cell models, which are entirely different from my PhD path.

Who are your role models in science? Why?

I suppose I have a lot of role models in science. These range from my PhD mentor (Robert Wheeler) and my postdoc mentor (Cory Robinson), to others who I have worked closely with in my field, including my PhD committee members (Dr John Singer, Dr Rebecca Van Beneden, Dr Julie Gosse and Dr Roger Sher) and the teaching assistant instructors I worked with in graduate school (especially Dr Con Sullivan). Each of these scientists has worked extremely hard to get to where they are today, and I am grateful for their contributions to science, their hard work ethic and their willingness to take a chance on me as a scientist.

What's next for you?

I am planning on leaving academia and working in a government environment. My main goals in life are to be able to work on the frontlines of infectious diseases in the context of research, to be able to improve the health of the public, but especially to help protect our military (and our citizens) from bio-threats.

Tell us something interesting about yourself that wouldn't be on your CV

Outside of the lab I am a big fan of exploring new places, especially if they are old and historic. I love taking weekend trips to old towns and abandoned places and exploring the history behind those places. I also love hiking with my pups and significant other.

Reference

Seman, B. G., Vance, J. K., Akers, S. M. and Robinson, C. M. (2021). Neonatal low-density granulocytes internalize and kill bacteria but suppress monocyte function using extracellular DNA. *J. Cell Sci* **134**, jcs252528. doi:10.1242/jcs.252528