

Investigator Spotlight: The JDRF-nPOD Scientists Who Seek the Cure for T1D

Each month, we highlight one of the nPOD investigators. Thanks to the fundraising of all the JDRF chapters, these scientists are able to have access to nPOD samples for their work. We'll let them introduce themselves, tell you about their research, and their lives.

Joseph Larkin, Ph.D. (University of Florida, Gainesville, FL)



1. Tell us about your education and background. Where are you from, and where did you go to school?

I am originally from Savannah, Georgia. I received a National Merit Scholarship to attend the University of Florida. I completed my Bachelor of Science degree in 1996. I remained at the University of Florida, working in the same laboratory in which I conducted undergraduate research to complete my Ph.D. in 2000.

2. Where do you currently work and what is your position? What does a “day in the life” look like for you?

I am currently an Assistant Professor at the University of Florida in the department of Microbiology and Cell Science. In addition to actively conducting research, I teach and coordinate a semester-long immunology course for upper division undergraduates. Days usually begin about 8:30 in my office with addressing pertinent emails, completing last minute details for the day’s lecture, or preparing for meetings later in the day. On Mondays, Wednesdays, and Fridays, I am actively involved in teaching from 10:00 am to noon. I also spend on average one additional hour each day meeting with an undergraduate student from the class who has specific questions. The remainder of Mondays, Wednesdays, and Fridays are generally spent analyzing data generated by my graduate Students and post-docs, or planning experiments. On Tuesdays and Thursdays I meet with my graduate students and post-docs regarding data and the planning of future experiments. I also spend time working on grants, preparing manuscripts, and speaking with collaborators.

3. Why diabetes? How did you get involved, and what made you want to work in diabetes research?

One of my sisters and several family members have type 1 diabetes. I have a first cousin who died due to complications related to T1D. The rates that people develop type 1 diabetes are going up, and people are developing diabetes at younger ages.

4. Tell us about your research.

One of the reasons type 1 diabetes occurs is because the immune system, which generally fights against infectious bacteria and viruses, begins to attack our own tissues. When the pancreas is attacked, it can’t control the blood glucose. My research focus is to better understand why the immune system attacks pancreas-related tissues, in hopes that it can be prevented.

My diabetes research has two parts:

- In collaboration with Dr. Maki Nakayama, Dr. Mark Atkinson, and others, we are trying to figure out which human proteins, related to insulin production, are actually being targeted by the immune system. Although many immune system cells are thought to contribute to T1D, a cell subset known as “T lymphocytes” is critically important. T lymphocytes work by recognizing a particular protein, usually made by infectious agents, such as bacteria and viruses. Once recognized, T lymphocytes attack that protein. In the case of T1D, it is thought that T lymphocytes attack a protein related to insulin production; however, the specific human protein isn’t known yet. Identification of that protein being attacked by the immune system could lead to a prevention of diabetes by devising strategies to protect the protein—or by developing ways to eliminate T cells that are attacking the protein.*
- My second project, in collaboration with Dr. Eric Triplett, Dr. Mark Atkinson, and others, involves trying to determine a role for commensal (resident) bacteria in the progression of T1D. In the section above, we mentioned that T lymphocytes recognize proteins made by infectious bacteria and viruses, followed by launching an attack. In contrast, we have millions upon millions of bacteria present in our guts that cause no problems, and are not attacked by our immune systems. In fact, these commensal bacteria have many important biological roles. Changes in practices, such as moving from breast feeding to formula feeding, or from a high-fiber diet to processed foods, can alter the bacteria composition in our guts. It is possible that changes in gut bacteria composition could play a critical role in increasing frequency of people developing type 1 diabetes.*

5. What are your thoughts on the progress being made in T1D as a whole?

Tremendous progress is being made by the many researchers working on diabetes. I am very optimistic that the many scientists working in T1D research will not only figure out ways to delay--or even prevent--disease onset in individuals susceptible to T1D, but they will also determine better ways to control diabetes in individuals with the disease.

6. Why is diabetes research so important?

Diabetes research is so important because there is currently no cure for type 1 diabetes. Although the administration of exogenous insulin has immensely helped in the survival and quality of life of those with T1D, too many still suffer from complications related to the disease.

7. Do you have anything else you would like to share? Is there anyone to thank or acknowledge?

I have been blessed to have many outstanding mentors. To name a few, I would like to acknowledge Dr. Howard M. Johnson (University of Florida), Dr. Andrew J. Caton (University of Pennsylvania), Dr. Yvonne Paterson (University of Pennsylvania), and Dr. Mark A. Atkinson (University of Florida).

8. When you’re not working, what do you like to do for fun?

I am married, with three daughters, ages 8 years, 5 years, and 1 month. Right now, I do not know the meaning of the term “not working”!!



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