

Physician Scientist Faculty Spotlight



Dr. Luke Wander is a board certified clinician with the Division of General Internal Medicine and Assistant Professor in the Department of Medicine. Dr. Wander is also an affiliate faculty member in the UW Center for Excellence in Maternal and Child Care.



Find out more about Luke's work:

- > Luke's Bio
- > UW Center for Excellence in Maternal and Child Care
- > Wander Research Group
- > Email Luke

Luke Wander, MD, MS, FACP

About Luke's work:

I am an internist and epidemiologist with post-doctoral training in cardiovascular and metabolic diseases and perinatal epidemiology. I use clinical, epidemiological, and experimental methods to conduct my research. Traditionally, we think of type 2 diabetes (T2D) as a homogenous clinical entity distinct from type 1 diabetes, but the truth is complex. Factors like obesity, insulin resistance, and pancreatic beta-cell dysfunction contribute to the development and progression of T2D to different extents in different populations. The goal of my research is to understand subgroup-specific mechanisms of T2D pathogenesis (from early life throughout the life course) to identify modifiable risk factors or treatments that can be specifically targeted to people who are most likely to benefit. One example of this work involves miRNAs, small segments of non-coding RNA that regulate gene expression, the process by which information encoded in our genes gets translated into proteins.

We have investigated levels of circulating miRNAs to understand how they might contribute to diabetes progression in cohort studies of Japanese Americans, youth with T2D, and women with gestational diabetes. In individuals of Japanese descent, we identified a list of circulating miRNAs that precede development of diabetes by 5-10 years, including miRNAs that control insulin secretion and apoptosis in the beta cell. One example is miR-7, which blocks multiple steps in a key pathway for beta-cell growth and proliferation called mTOR. We are studying this miRNA and others to understand how metformin might slow progression of beta-cell failure in youth with T2D (a subgroup that has severe insulin resistance and rapid progression compared to adults at a similar stage of the disease). In preliminary results, we have seen more than 50 plasma miRNAs that are different at baseline in youth who had improvement in beta-cell function while on metformin (and insulin, in some cases) compared to youth who had worsening in beta-cell function, including some that were also linked to the development of diabetes in our work in Japanese Americans, such as miR-17, an inhibitor of apoptosis in the beta cell. At the same time, we are conducting in vitro experiments to determine whether these or other miRNAs act directly in the beta cell to mediate effects of metformin on insulin secretion or cell survival, using functional experiments with miRNA inhibitors and mimics. Lastly, we are considering the use of circulating miRNAs as subgroup-specific predictive biomarkers of diabetes risk. Gestational diabetes is a very strong risk factor for subsequent T2D, and mothers pregnant with male fetuses face a higher risk of GDM than mothers pregnant with female fetuses for reasons that are unexplained. In a cohort study of pregnant women, we found miRNAs in the circulation at mid-trimester that precede the development of GDM in mothers pregnant with male fetuses. These associations were not seen in mothers pregnant with female fetuses. These miRNAs, such as miR-155, regulate genes controlling inflammation and cell growth and death throughout the body.

About working at UW:

Across our institutions, we have some of the finest researchers in the world in many disciplines. At the same time, I have found people here to be accessible and very open to collaborations. It feels like a great privilege that these busy individuals go out of their way to find time for me, think through my scientific ideas with me, and provide advocacy and support. UW has the mentorship, administrative support, and state-of-the-art laboratory collaborators I need to do the best work I can. I have awesome collaborators within and outside the School of Medicine. This includes my clinical, epidemiology, and experimental research mentors as well as people with expertise in complementary disciplines such as islet cell biology, bioinformatics, and biostatistics. I believe these collaborations have given my work pretty broad translational impact.