

Combining Data and Mathematical Models to Understand Glucose Regulation and Diabetes



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12:00 – 1:00 PM
BMI Classroom 4004
Woodruff Memorial Research Building

Or

Join us on Zoom link:
<https://zoom.us/j/97262307973>



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Abstract: Diabetes, a disease characterized by high blood glucose, is the 8th leading cause of death worldwide. I will discuss my ongoing work using mathematical and biophysical models to understand healthy glucose regulation and diabetes. In one line of work, we propose and test a mathematical model for the pathogenesis of ketosis-prone diabetes, a subtype of diabetes with unusually fast dynamics. By fitting our model to data from individual patients, we identify patient-specific rates of disease processes and propose optimized treatment protocols. In another project, I am working to understand the design principles of healthy glucose control. I will show how spatial variation in glucose concentrations places strong constraints on glucose regulation, revealing one of the basic principles which has forced evolution to regulate blood glucose using hormones.

Biography: Sean Ridout received his PhD in Physics from the University of Pennsylvania, studying amorphous solids and supercooled liquids using a mixture of theory and machine learning. He is now a postdoctoral fellow in the Department of Physics at Emory, where he is working on theoretical analyses of how machine learning works and mathematical modeling of diabetes physiology.