Professor Leconte's research interests include protein engineering, biotechnology, biomolecular evolution, DNA polymerases, and bioluminescent imaging. His research group is interested in using biochemistry to understand the molecular basis of the evolution of new function in proteins. In doing so, researchers hope to better understand evolution and how to apply it more effectively to the creation of useful protein-based medicines and materials.

Professor Leconte earned his bachelor's degree from Carleton College and his doctorate from the Scripps Research Institute. He was a post-doctoral fellow at Harvard University.

Information:
https://z.umn.edu/LeconteAaron

My research group seeks to leverage biochemical characterization and protein engineering to better understand and optimize protein function. We are currently actively working on two systems, both of which will be discussed.

We are interested in developing Taq DNA polymerase mutants that are able to synthesize nuclease-resistant forms of modified DNA, which has applications in clinical diagnostics and aptamer technologies. We have focused on using commercially available substrates and attempting to develop robust, accessible, accurate M-DNA synthesis and reverse transcription reactions. Our best mutant M-DNA polymerases are able to synthesize long M-DNAs in less than 10 minutes; the M-DNA can be reverse transcribed and amplified using entirely commercial reagents in less than an hour.

We are also developing luciferases for use in multi-component imaging, in collaboration with Professor Jennifer Prescher (University of California-Irvine). We have used bioinformatics to rapidly identify mutant luciferases with improved function in substrate resolved multi-component imaging applications, and we are currently developing deep mutational scanning approaches to luciferase biochemistry.

The work that will be described has been performed entirely by undergraduates at The Claremont Colleges, and some of it has been integrated into course-based undergraduate research experiences. I will highlight the unique opportunities and challenges in this area as well.