VANDERBILT SCHOOL OF MEDICINE | Basic Sciences

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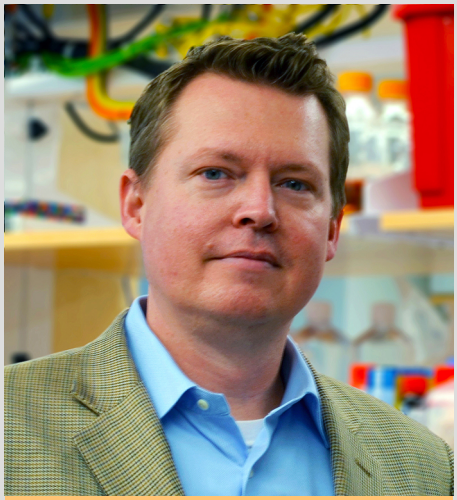

Biosketch

Dr. Dylan Burnette was born and raised in Dalton, GA. He attended Georgia public schools through his bachelor's degree from the University of Georgia, Athens. At UGA, Dylan became enamored with the question of how cells change their shape in order to move.

Shape-change is inherently a property of a cell's cytoskeleton. As such, the cytoskeleton has been the focus of Dylan's research interests his entire adult life. He has previously perused these interests during his graduate work at Yale University studying neurons and his post-doc at the National Institutes of Health studying cancer cells.

Key Publications

"Focal adhesions control cleavage furrow shape and spindle tilt during mitosis," *Scientific Reports*, Jul 19;6:29846, 2016

"Expansion and concatenation of non-muscle myosin IIA filaments drive cellular contractile system formation during interphase and mitosis," *Molecular Biology of the Cell*, mbc.E15-10-0725; First Published on March 9, 2016

"A contractile and counterbalancing adhesion system controls the 3D shape of crawling cells," *Journal of Cell Biology*, Apr 14;205(1):83-96, 2014

"Assembling contractile systems to drive cell motility and muscle contraction"

Our cells produce **contractile force**. This type of cellular force is usually a good thing. Currently, our **heart muscle cells** are producing contractile force to pump blood throughout our bodies. Our **immune cells** can use contractile forces to hunt down and kill external threats (e.g., bacteria) and internal threats (e.g., cancer cells). However, when gone awry, **contractile forces can result in catastrophic health changes**.

Abnormalities in contractile forces lead to **heart disease**, and **cancer cells also utilize contractile forces to move away from a primary tumor** (i.e., metastasize). Research in the Burnette lab revolves around the **molecular motor that generates contractile force: myosin II**. Different versions of myosin II drive cell crawling, cell division, and muscle contraction. As such, **we study the function of myosin II** in these three cellular contexts.

Currently, we are fascinated with **how myosin II-based contractile systems assemble within cells**. By combining high resolution microscopy, high content microscopy, and genomic/proteomic analysis, we are working out the details of assembly. Our long-term goal is to determine how we can **re-assemble diseased contractile systems**.

Sarcomere Assembly in Human Cardiomyocytes