Kinesin Motor Proteins and Primary Cilia

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Teresa Blasius is a Research Lab Technician in the Department of Cell and Developmental Biology at the University of Michigan. She works in the Kristen Verhey’s lab, also in the Department of Cell and Developmental Biology.

Their research is focused on characterizing Kinesin motor proteins. There are 14 Kinesin motor proteins families, all of which utilize microtubules in the cell. The researchers in Verhey’s lab are focused on studying basic biological questions about the proteins such as how the motility properties of different Kinesin motor proteins differ and how they cooperate to transport biological components throughout the cell. With a better understanding of these proteins, they hope to gain a better understanding of the primary cilium and how it is regulated. Cilia are organelles in eukaryotic cells that project from the much larger cell body. Primary cilium project from the cell and typically serves as a sensory organelle. It is important in both signal transduction and regulation of the cell cycle. Verhey’s lab is focused how protein trafficking into and out of the cilium is regulated and what role Kinesin plays in building and maintaining them.

The researchers in Verhey’s lab utilize the services and products of both the Biomedical Research Store and the DNA Sequencing Core. Their work requires them to constantly make changes to their Kinesin constructs. They use the Store to buy the reagents they need to create these construct and DNA Sequencing to verify them. “Having these cores available means that we have a short turnaround time between making a new construct and testing it in an experiment,” Teresa explained.

They have also worked with the Microscopy & Image Analysis, Flow Cytometry, and Vector cores on various projects. “Our work with other core facilities on campus has enabled us to conduct experiments that we would otherwise be challenged to do due to lack of equipment or specific expertise.”