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The vascular system transports blood and immune cells throughout the body. Yet, how these cells selectively cross the endothelium and enter the appropriate cellular tissues is unclear. Dr. Gwendolyn Beacham will explore the fundamental mechanisms underlying this endothelial transmigration in [Dr. Elliott Hagedorn's](#) and [Dr. Christopher Chen's](#) labs at Boston University. Beacham predicts that endocytosis is important for this process and has identified candidate proteins by investigating blood stem cells. She will use zebrafish as a model system to validate her preliminary findings. Then, Beacham will use this understanding to engineer blood vessels with controllable endothelial transmigration in zebrafish and in human cell culture. This research may help improve the efficiencies of cancer therapies that rely on endothelial transmigration, such as bone marrow transplants and engineered CAR T-cells.

As a Ph.D. student in [Dr. Gunther Hollopeter's](#) lab at Cornell University, Beacham investigated clathrin-mediated endocytosis. In particular, she discovered that [endocytosis is inactivated via phosphorylation of the clathrin Adaptor Protein 2](#). These findings revealed a novel regulatory mechanism for endocytosis and set up Dr. Beacham to explore how endocytosis contributes to endothelial transmigration.

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