2013 JMNMF RSA Summary & Photo
David Benjamin, MIT – Koch Institute for Integrative Cancer Research at MIT

Pictured Left to Right: Richard Hynes, PhD, Daniel K. Ludwig Professor for Cancer Research Investigator, Howard Hughes Medical Institute; Greg Safko, JMNMF President; L-R Front: Anne Deconinck, Interim Executive Director, Koch Institute; Susan Bancroft, JMNMF Board Member; Regina S. Bodnar, RN, JMNMF Chair; and, David Colin Benjamin, JMNMF RSA Recipient

Metastasis is the primary cause of melanoma-related mortality yet it remains incompletely understood.

In order to successfully metastasize, a melanoma cell must undergo a series of sequential steps that have been termed the metastatic cascade. These steps include migration away from the primary tumor towards blood vessels, entry into circulation, arrest in blood vessels at the metastatic site, escape from these blood vessels, and finally growth from a single cell into a metastatic tumor containing thousands of cells.

The early steps in this process have been well studied. However, the later steps, namely, arrest in blood vessels, escape from blood vessels and the early growth of new metastases are less well understood. This is partly due to the difficulty in imaging these events in a living animal.

Recently, a strain of zebrafish has been developed that is transparent, owing to the genetic deletion of pigment cells. Using these fish, I am able to image the later steps of metastasis in real-time over long periods. Through live imaging, I am studying the contributions of certain immune cells to the later stages of metastatic progression. These cells have been shown to be crucial for metastasis, however, existing studies have all involved looking at single time-points. By looking at these interactions over time, I hope to gain a better understanding of how these immune cells are helping cancer cells metastasize.