

# CARNEGIE MELLON UNIVERSITY BME 2024 SPRING SEMINAR SERIES

## The Development of Neuroimaging Biomarkers in Sickle Cell Disease



### PRESENTED BY

#### **Melanie Fields, M.D.**

Associate Professor  
Associate Fellowship Director  
Pediatric Hematology/Oncology  
Washington University in St. Louis  
St. Louis Children's Hospital

### SCHEDULE

**Doherty Hall (DH) 2315**

**Thursday,  
March 14, 2024  
(11:00-12:00PM)**

Sickle cell disease impacts approximately 100,000 people in the United States and millions worldwide. People with sickle cell disease are at risk for debilitating neurological complications, including cerebral vasculopathy, stroke and cognitive decline independent of stroke. However, the underlying pathophysiology of these complications in sickle cell disease remains unclear. In her presentation, she will present her lab's work utilizing MRI to understand the impact of sickle cell disease on brain development. Using MR measures of cerebral hemodynamics, they define global and regional compensatory mechanisms for anemia in the brain, the relationship between these imaging metrics and stroke and the impact of disease modification on these potential imaging biomarkers of cerebral metabolic stress. With functional connectivity MRI, they investigate the impact of sickle cell anemia and cerebral metabolic stress on large-scale functional networks to better define the physiology of cognitive dysfunction in this vulnerable population. Through their work, they hope to better understand the impact of anemia on brain maturation and work towards the development of neuroimaging biomarkers to assess the impact of novel therapeutics for patients with sickle cell disease.

