



# MATTHEW REYNOLDS, Ph.D.

LABORATORY OF RUI ZHANG, Ph.D.  
DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOPHYSICS  
WASHINGTON UNIVERSITY IN ST. LOUIS

## JANE COFFIN CHILDS FELLOW

Dr. Matthew Reynolds is fascinated with the elegant structures of our cytoskeleton – a large network consisting of protein fibers and associated proteins that gives shape and structure to cells. During his thesis research he developed machine-learning based techniques to enable the structural determination of curved and bundled actin structures. In his fellowship, Reynolds will detail specialized cytoskeleton super-assemblies from parasitic cells.

During Reynolds' thesis research in [Dr. Greg Alushin's lab at Rockefeller University](#), he made important contributions to processes involved in cryo-EM structure determination. Reynolds developed computational techniques that were crucial in [reconstructing bent F-actin segments](#) and [bundled F-actin](#) that help shape and move cells.

Now, in [Dr. Rui Zhang's lab at Washington University in St. Louis](#), Reynolds will apply his structural biology expertise to more complex cellular systems. He will continue to investigate the cytoskeleton and will use a combination of cryo-EM and cryo-electron tomography (cryo-ET) to examine microscopic single-cell organisms. These studies will provide mechanistic insights into the nanoscale protein-protein interactions that drive micron-scale cytoskeleton organization in single-celled parasites. His research will likely push forward technological development in structural determination via cryo-EM and cryo-ET. Reynolds anticipates that his findings will inform parasitic disease models and may reveal novel therapeutic targets.

W  
O  
T  
E  
F