The actin cytoskeleton is a major component of the eukaryotic cell, involved in key functions including cell shape, motility and mechanical stability. Actin self-assembles to form filaments (F-actin) and these filaments may assemble into different structures including bundles and networks. I have investigated a range of interesting structures formed on different length scales from F-actin bundles and cross-linkers using small angle x-ray scattering, electron microscopy and confocal microscopy. I am also interested in novel ways to align protein filaments for structural studies and have shown that assembling F-actin and microtubules in confined geometries can produce well-aligned samples in surface-matched, titanium or silicon microchannel devices. Micro-devices allow for easy observation of the behavior of single molecular assemblies under controlled environmental conditions via fluorescence microscopy.