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# REGIONAL CENTRE FOR BIOTECHNOLOGY

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## Seminar series

# New collaborations of formins in actin assembly and organization

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**Monday, February 17th, 2014**

**3:00 PM**

**RCB Seminar Room**

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# Abstract

Cells rapidly remodel their actin cytoskeletons in order to perform a variety of essential functions including directed cell migration, cell morphogenesis, cytokinesis, phagocytosis, neuronal path finding, and synapse formation. Precise regulation of actin filament assembly dynamics during these processes is critical, and defects in the machinery performing these functions lead to diseases, including birth defects, mental retardation, heart disease, and invasive cancers. An emerging view is that multiple actin assembly-promoting factors work in concert to control actin filament dynamics in cells, but the underlying mechanisms of such collaborative actin assembly have remained a mystery until now. In my talk, I will present new mechanistic findings that describe two key collaborations involving formins (a family of conserved actin assembly-promoting factors) and their *in vivo* binding partners. This will include novel insights gained by multi-color TIRF imaging at the single molecule level and reconstitution of actin filament assembly/bundling *in vitro*. These observations reveal that certain formins, apart from their more established roles in actin nucleation and elongation, promote filament bundling *in vivo*, and are critical for the formation of filopodial protrusions in multiple cell types. My talk will conclude with a discussion of where my research is heading in the coming 5-10 years and how I will apply a multi-disciplinary approach to address several fundamental yet unanswered questions in the field.

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