2017 LPS BMCB Best Paper Award: Laura Thomas

GTPase cross talk regulates TRAPPII activation of Rab11 homologues during vesicle biogenesis

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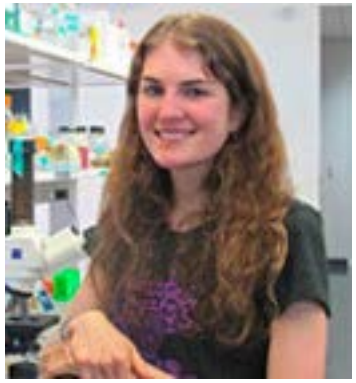
Rab guanosine triphosphatases (GTPases) control cellular trafficking pathways by regulating vesicle formation, transport, and tethering. Rab11 and its paralogs regulate multiple secretory and endocytic recycling pathways, yet the guanine nucleotide exchange factor (GEF) that activates Rab11 in most eukaryotic cells is unresolved. The large multisubunit transport protein particle (TRAPP) II complex has been proposed to act as a GEF for Rab11 based on genetic evidence, but conflicting biochemical experiments have created uncertainty regarding Rab11 activation. Using physiological Rab-GEF reconstitution reactions, we now provide definitive evidence that TRAPPII is a bona fide GEF for the yeast Rab11 homologues Ypt31/32. We also uncover a direct role for Arf1, a distinct GTPase, in recruiting TRAPPII to anionic membranes. Given the known role of Ypt31/32 in stimulating activation of Arf1, a bidirectional cross talk mechanism appears to drive biogenesis of secretory and endocytic recycling vesicles. By coordinating simultaneous activation of two essential GTPase pathways, this mechanism ensures recruitment of the complete set of effectors needed for vesicle formation, transport, and tethering.



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