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Molecular Insights into Membrane Trafficking by the SNX27-retromer Complex

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Compartmentalisation is a defining feature of all eukaryotic cells, and we have evolved highly sophisticated protein machineries to control the flow of transmembrane moleculesand membrane lipids between different organelles. Disruption of these processes are linkedto numerous diseases including neurodegenerative disorders, pathogen invasion andcancer. We are determining how these trafficking machineries are assembled and regulatedat the molecular level through a combination of structural biology, biophysical, and cellbiology approaches. In my talk, I will describe our most recent work on critical protein sortingmachineries – the retromer complex and the sorting nexins (SNXs) - regulating endosomalmembrane recycling and cellular homeostasis. We have defined sorting signals requiredfor endosomal recycling by the SNX27-retromer complex, how this is regulated by post translation alphosphorylation, and the structural basis for SNX27-retromer-cargoassembly.