

Guest lecture

Lipid rafts and cellular phase transitions

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15:15 PM in BMB seminar room



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Abstract:

Cell membranes have developed a tremendous complexity of lipids and proteins geared to perform the functions cells require. To coordinate these functions, the bilayer has evolved the propensity to segregate its constituents laterally. This capability is based on dynamic liquid-liquid immiscibility and underlies the raft concept of membrane sub-compartmentalization. Key to understanding the principles underlying liquid-liquid de-mixing in cell membranes is the mutual weak interactions between sterols, sphingolipids and raft proteins. The potential for sphingolipid-cholesterol self-assembly combines with protein specificity to dynamically regulate protein segregation within the membrane plane. This mechanism is employed in regulating endocytic or exocytic membrane transport, in transducing specific signals across the plasma membrane or to perform different biochemical reactions dependent on the proteins involved. The regulation of the two dimensional separation of lipids and proteins in membranes into dynamic liquid membrane rafts is dependent on the propensity for liquid phase separation. Most importantly, cellular plasma membranes seem to be poised close to a phase transition, facilitating dynamic sub-compartmentalization with little energetic cost. Liquid phase transitions are not confined to cell membranes. Liquid phase transitions are emerging as a general principle driving cellular organisation.

Host: Associate Professor Christer Ejsing, Department of Biochemistry and Molecular Biology, SDU