Nonequilibrium control of cell membrane organisation - active emulsions

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The organisation of lipids and proteins on the plasma membrane have conventionally been described using equilibrium physics principles. Over the years there is growing evidence for a nonequilibrium control of membrane composition arising from the interaction of membrane components with cortical components. A specific example of this is the interaction with cortical actomyosin. This gives rise to dynamic nano clusters of membrane proteins and mesoscale active emulsions of lipids. Such a nonequilibrium picture highlights the role of membrane asymmetry and transbilayer coupling. Specificity of organisation is also facilitated by having an elaboration of the actomyosin cortex with a diversity of force generators. In this talk I will highlight the new theoretical ideas that form the basis of this active view of the cell membrane.