CICLO DE SEMINARIOS 2012

SMAT-C Soft Matter Research and Technology Center

"A Model of cisternae maturation and vesicle transport in Golgi apparatus"

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The Golgi complex is composed of 6-8 non-identical compartments (cisternae) that gradually age and dissolve (mature) and are known to exchange vesicles.
How does a vesicular traffic between the Golgi cisternae become directional and how does this traffic, accompanied by gradual cisternae maturation and replacement, lead to the inhomogeneous steady-state distribution of Golgi enzymes? We find that a temporal decay of cisternal concentration of a molecule that controls vesicular fusion (t-SNARE), caused, for example, by loss of a fraction of vesicles, provides a ``seed" gradient in concentration, and thus a seed directionality of transport. This gradient, subsequently self-enhanced by vesicular transport, appears sufficient to explain the predominantly retrograde flow of vesicles.
Competitive interactions between the vesicular cargo molecules and vesicular binding sites produce the inhomogeneous steady state distribution of the Golgi enzymes. Superposition of these two effects explains functioning of the Golgi transport machinery, currently considered to be consisting of two pairs of SNAREs, and at least three cisternal-segregated groups of enzymes.

Martes 21 AGOSTO 2012, 13:00 horas

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