



Terasaki Ramps in the Endoplasmic Reticulum: Structure, Function and Formation



Greg Huber, Ph.D.

Kavli Institute for Theoretical Physics

Department of Physics

University of California, Santa Barbara

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ABSTRACT:

The endoplasmic reticulum (ER) has long been considered an exceedingly important and complex organelle in eukaryotes. It is a membrane structure, part folded lamellae, part tubular network, that both envelopes the nucleus and threads its way outward, all the way to the cell's periphery. Despite the elegant mechanics of bilayer membranes offered by the work of Helfrich and Canham, as far as the ER is concerned, theory has mostly sat on the sidelines. However, refined imaging of the ER has recently revealed beautiful and subtle geometrical forms – simple geometries, from the mathematical point of view – which some have called a “parking garage for ribosomes.” I'll review the discovery and physics of Terasaki ramps and discuss their relation to cell-biological questions, such as ER and nuclear-membrane re-organization during mitosis. Rather than being a footnote in a textbook on differential geometry, these structures suggest answers to a number of the ER's structure-function problems.

Host: Van Savage, Ph.D.

To receive e-mail seminar notices, contact David Tomita (dtomita@biomath.ucla.edu)