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Pioneering golgin purification and the first experimental evidence of coiled-coil presence

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The endoplasmic reticulum and the Golgi complex are essential organelles for the eukaryotic cell. They play a crucial role in the targeting, processing, and modification of newly synthesized proteins and lipids, in the so-called classical secretory pathway. The Golgi displays a compartmentalized and polarized architecture, but also a dynamic structure due to the continuous flow of its components in the form of vesicles. Golgi matrix proteins, formed by the Golgi reassembly and stacking Proteins, and, most numerous, Golgins, act together to maintain the stacked structure of the cisternae and are essential for their ribbon-like organization in animals. (1) Deciphering the mechanisms of these families of macromolecules will help us understand what guarantees the structure and function of the organelle. However, the complexity and dynamics of Golgins represent a challenge for researchers, who face difficulties in obtaining significant quantities of these proteins for detailed structural and biophysical studies. A new strategy for purifying the "Binder of USO1 and GRH1 protein 1", or BUG1, a Golgin present in the yeast *Saccharomyces cerevisiae*, was established and opens doors for conducting novel structural analyses with a Golgin member. We have also obtained the first experimental data showing the real presence of coiled coils in Golgin organization, a feature accepted in the literature but previously based solely on computational predictions. (2) The ultimate goal is to work on the hypothesis that Golgins play a decisive role in structuring Golgi complex cisternae by means of condensation through phase separation. (3)

Palavras-chave: Phase separation; Golgins; Golgi complex.

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