

THE GOLGI APPARATUS AND MEMBRANE SYSTEM OF Amoeba proteus

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by

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Abstract

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It was found during this study that the shape, size, number per cell and morphometries of Golgi bodies in A. proteus varied during the cell cycle. The circular shaped Golgi bodies are believed to be the younger form while the older ones have a linear form. Golgi bodies of A. proteus have been found in a continuity with endoplasmic reticulum (ER) throughout the different stages of ^{the} cell cycle. Their membrane surface and volume are found to be correlated. The Golgi apparatus has also been shown to originate and be maintained by the ER during the cell cycle. Golgi apparatus and ER have been found to assist in the formation of cell membrane especially during cytokinesis and also in the formation of cell coat material and primary lysosomes.

The ³H-glycerol and ³H-choline chloride experiments have shown that membrane organelles including ER, Golgi apparatus, cell membrane, nuclear membrane, pinocytic vesicles, Golgi vesicles, digestive vesicles and other vesicles are connected and form a single membrane system. Membrane phospholipids were found to be synthesized on ER and flowed to other membrane organelles through the Golgi apparatus and Golgi vesicles. There were at least three pathways of membrane flow in A. proteus. Cytoplasmic lipid droplets were found to be a storage site of membrane phospholipids molecules including glycerol.

The cytochemical and ultrastructural studies of the Golgi bodies showed that the two poles of the Golgi stack (i.e. the convex and concave pole) were continuous and not separate as proposed in earlier studies. This study also showed that the cisternae situated at the convex pole changed function gradually during movement to the mature face (concave pole).