

GRANULOGENESIS IN SYMPATHOADRENAL CHROMAFFIN CELLS: CONTRIBUTION OF THE NEUROENDOCRINE SECRETORY PROTEIN SECRETOGRANIN II.

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The biogenesis of dense-core catecholamine storage vesicles (CSVs) in neuro-endocrine cells is poorly understood. The secretory prohormones chromogranins/secretogranins are widely distributed in biogenic amine- and peptide-containing CSVs, and have been proposed to play a key function in the biogenesis of CSVs. In the present study, we investigated the putative CSV-forming role of secretogranin II (SgII).

Downregulation of SgII expression by siRNA resulted in significant decrease in the abundance of CSVs in normal sympathoadrenal cells (PC12). Using a combination of fluorescence deconvolution microscopy and secretagogue-stimulated release approaches, we further assessed the granulogenic role of SgII in the sympathoadrenal cell variant (A35C), which lacks regulated secretory organelles. We show that expression of human SgII in the form of fusion proteins with the hemagglutinin epitope HA, GFP, or embryonic alkaline phosphatase (EAP) reporters induces the formation of secretory vesicles and a regulated secretory pathway in A35C cells.

We conclude that the secretory prohormone SgII plays also a key role in the biogenesis of CSVs in neuro-endocrine cells.