CHGA-derived peptide binds the bacterial cell surface

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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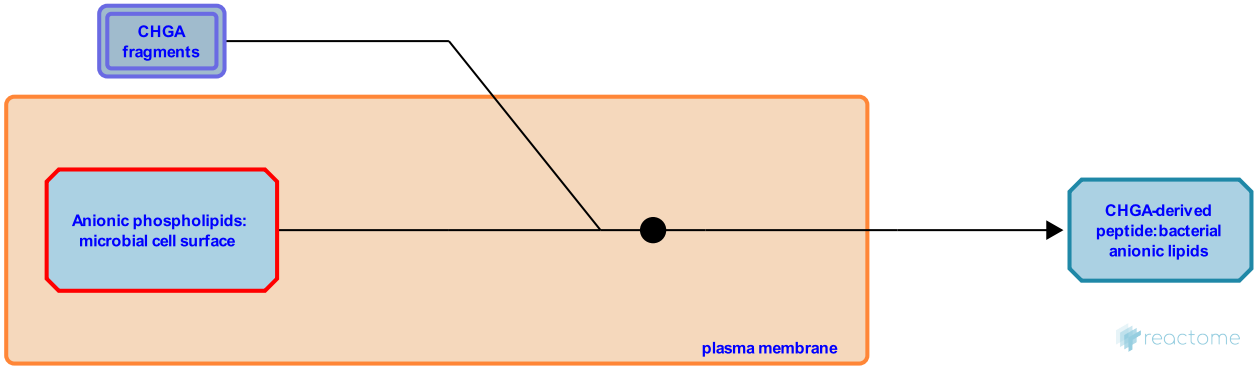
Stable identifier: R-HSA-6808566

Type: binding

Compartments: extracellular region, plasma membrane



Chromogranin A (CHGA) belongs to the granin family of acidic proteins enclosed in secretory vesicles of nervous, endocrine and immune cells. The proteolytic cleveages of specific CHGA sequences by the pro-hormone convertases generate bioactive fragments that exert a broad spectrum of regulatory activities by influencing the endocrine, cardiovascular and immune systems and affect glucose and calcium homeostasis (Helle KB et al. 2007; Aslam R et al. 2012; D'amico MA et al. 2014; Aung G et al. 2011; Tota B et al. 2014).

Several CHGA-derived peptides such as vasostatin-1 (CHGA(19-94)) and catestatin (CHGA(370-390)) display antimicrobial activities against bacteria, fungi and yeasts (Lugardon K et al. 2000; Briolat J et al. 2005; Radek KA et al. 2008; Aslam R et al. 2013; Shooshtarizadeh P et al. 2010). These peptides are found in biological fluids involved in defence mechanisms (human serum and saliva) and in supernatants of stimulated human neutrophils (Lugardon K et al. 2000; Briolat J et al. 2005). In addition, catestatin (CHGA(370-390) exhibits antimicrobial activity against skin pathogens suggesting a function in cutaneous antimicrobial defense (Radek KA et al. 2008). Biophysical and structural analysis of human catestatin and bovine cateslytin suggests that cationic CHGA-derived peptides interact with anionic phospholipids on the bacterial surface (Sugawara M et al. 2010; Jean-Francois F et al. 2008). However, It remains to be clarified whether catestatin functions as a pore-forming or cell-penetrating agent.

Literature references

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Editions

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