Structure-function analysis of human Septin 7 and Septin 9. GTPase domain

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Septins is a protein familly that has a GTP binding domain and is conserved in several organisms, from fungi to animals. Septins are able to form complex homo and heteoligomers involved in several cellular pathways. In mammals, septins have been associated with a variety of cellular functions such as cytokinesis, exocytosis, the development of neurodegenerative diseases and some types of carcinomas. This study describes our results in the investigation of the catalytic activity of the Septin 7 (SEPT 7) GTPase domain as well as Septin 9 (SEPT 9) crystal structural information. The gene that encodes the GTPase domain SEPT 9 was amplified by PCR technique, from a cDNA library generated from human fetal brain. The amplified fragments were cloned and expressed in *Escherichia coli* and purified in soluble form by 10% ammonium sulphate precipitation followed by molecular exclusion chromatography. Data analysis from circular dichroism shows the secondary structure conservation, compard with previous results. This study also revealed that SEPT7 and SEPT9 are stable at different pH and to thermal variation. We have obtained information on the formation of homofilaments of SEPT9 by intrinsic fluorescence spectroscopy. GTPase domain of SEPT homofilament formation was characterized by ize esclusion chromatography. Results from Small-Angle Ligth Scatterin (SAXS) experiments reveal the possible conformation adopted by the enzymes in the homofilament formation and protein-protein interactions. The results of this study will add information to the fundamental knowledge about the structural biochemistry of human septins.

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