

## **Functional characterization of nicotinic acetylcholine receptor in different lipid-analog detergent families**

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The nicotinic acetylcholine receptor (nAChR) belongs to the family of ligand-gated ion channels (LGIC) which include GABA type A, serotonin type 3 and glycine receptor. The LGIC are key components of signal transduction mechanisms and important targets for the treatment of several neurodegenerative diseases such as Alzheimer, schizophrenia, depression, cardiovascular diseases, inflammation, and nicotine addiction. The currently structure of the nAChR is at a 4.0 Å and was obtained only with the transmembrane domains in a closed state. This structure doesn't provide the information on the coupling of agonist and/or antagonist to ion channel activation or about lipid-protein interaction in the interface. The mechanism by which detergents affects lipid composition, purity, functionality and stability of the detergent-solubilized membrane proteins is poorly understood. A fundamental aspect in the preparation of nAChR-DC's suitable for crystallization studies is the purity and therefore functionality of the sample. The nAChR is embedded in the lipid membrane in conjunct with some intrinsic peripheral proteins such as Na<sup>+</sup>/K<sup>+</sup> ATPase and 43kD Rapsyn. The objective of these experiments is to assess the functionality, purity, stability, and lipid composition of the nAChR-LFC16 glycerol, nAChR-LFC14 glycerol and nAChR-FC12 glycerol.