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Data Article

Functionality and stability data of detergent purified nAChR from *Torpedo* using lipidic matrixes and macroscopic electrophysiology

Luis F. Padilla-Morales [a], José O. Colón-Sáez [b], Joel E. González-Nieves [c], Orestes Quesada-González [d,e,**], José A. Lasalde-Dominicci [c,e,*]

[a] *Department of Chemistry, University of Puerto Rico, Río Piedras Campus, San Juan, PR, United States*
[b] *Department of Pharmaceutical Sciences, School of Pharmacy, Medical Sciences Campus University of Puerto Rico, San Juan, PR, United States*
[c] *Department of Biology, University of Puerto Rico, Río Piedras Campus, San Juan, PR, United States*
[d] *Department of Physical Sciences, University of Puerto Rico, Río Piedras Campus, San Juan, PR, United States*
[e] *Molecular Science Building, University of Puerto Rico, San Juan, PR, United States*

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ABSTRACT

The presented data provides additional information about the assessment of affinity purified nicotinic acetylcholine receptor (nAChR) rich membrane solubilized with long chain (16 saturated carbons) lysophospholipid with glycerol headgroup (LFG-16). The assessment of stability and functionality of solubilized membrane protein is a critical step prior to further crystallization trails. One of the key factors for this task is the appropriate choice of a detergent that can support nAChR activity and stability comparable to the crude membranes. The stability of the nAChR-LFG-16 complex incorporated into lipid cubic phase (LCP) was monitored for a period of 30 days by means of fluorescence recovery after photobleaching (FRAP) and the functionality was evaluated after its incorporation into *Xenopus oocyte* by means of the two electrode voltage clamp technique.

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* Corresponding author.
** Co-corresponding author.
E-mail addresses: quesada.orestes@gmail.com (O. Quesada-González), jlasalde@gmail.com (J.A. Lasalde-Dominicci).

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Specifications Table

Subject area	*Biochemistry*
More specific subject area	*Membrane protein, oocyte electrophysiology*
Type of data	*Graph and figure*
How data was acquired	*Two electrode voltage clamp and FRAP Assay using a Zeiss LSM 510 confocal microscope*
Data format	*Filtered and analyzed*
Experimental factors	*Application of lipid analogue detergent*
Experimental features	The stability and functionality of solubilized nAChR was examined by fluorescence recovery after photobleaching and two electrode voltage clamp techniques
Data source location	N/A
Data accessibility	*Data is supplied in this article*

Value of the data

- The unique approach used to assess functional activity of an ion channel-detergent complex provides a practical and rapid method for screening activity of other membrane protein detergent complex prior to crystallization trials.
- The result provided here may forewarn some researchers who are using traditional detergent for the solubilization of membrane protein about the possible effects of detergent structure on channel functionality.
- The data can be useful for other researchers investigating the effects of different detergent head groups on the stability of solubilized membrane proteins.

1. Data

We provide additional data about the stability and functionality of nAChR solubilized from *Torpedo californica* with the lipid analog detergent, 1-hexadecanoyl-*sn*-glycero-3-phospho-(1′-*rac*-glycerol) (LFG-16). The stability of the affinity purified nAChR-LFG-16 detergent complex was determined after it incorporation into lipid cubic phase (LCP) of 1-(cis-9-Octadecenoyl)-rac-glycero for a period of 30 days using Fluorescence Recovery after Photobleaching (FRAP)(Fig. 1). The functionality of the purified nAChR-LFG-16 detergent complex was studied after reconstitution into *Xenopus* oocyte by mean of two electrode voltage clamp (Fig. 2).

2. Experimental design, materials and methods

2.1. Crude membrane protocol

nAChR extraction was performed homogenizing 60 g of *Torpedo californica* tissue for 4 min in cold room with 120 ml of buffer A (100 mM NaCl, 10 mM Sodium Phosphate, 5 mM EDTA, 5 mM EGTA,

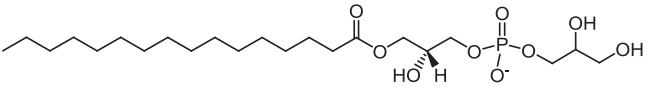

Fig. 1. Structure of the phospholipid analog detergents 1-palmitoyl-2-hydroxy-*sn*-glycero-3-phospho-(1′-*rac*-glycerol) (LFG-16) used for the solubilization nicotinic acetylcholine receptor from *Torpedo californica* electric organ, using the phospholipid analog detergent 1-palmitoyl-2-hydroxy-*sn*-glycero-3-phospho-(1′-*rac*-glycerol) (LFG-16).