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Supporting information for article:

Segregation of lipids near acetylcholine-receptor channels imaged by cryo-EM

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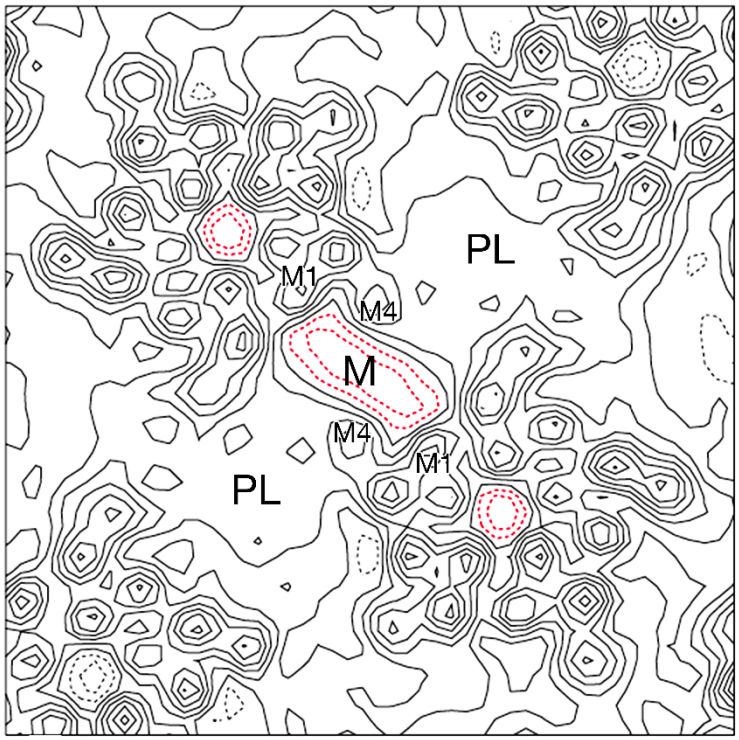

Figure S1 Contour map of the densities in the middle of the outer headgroup region, corresponding to the boxed area in Fig. 3. The phospholipid headgroups (PL) give rise to a fairly uniform positive density in the space between individual protein molecules, because of their (presumably) random disposition. The space framed by the M1 and M4 helices of the δ subunits, and associated with the microdomain (M), is an exception. The weaker density here is equal to that of the lumen of the pore, indicating a depletion of the large phospholipid headgroups and their substitution by water. The presence of cholesterol in the underlying membrane explains this anomaly, since cholesterol exposes only a hydroxyl and contributes no mass this far from the hydrophobic core of the membrane (for examples of simulated cholesterol-containing membranes, see: http://cmb.bio.uni-goettingen.de/cholmembranes.html). Contours are at 0.6σ, with the relevant microdomain and pore regions in red.

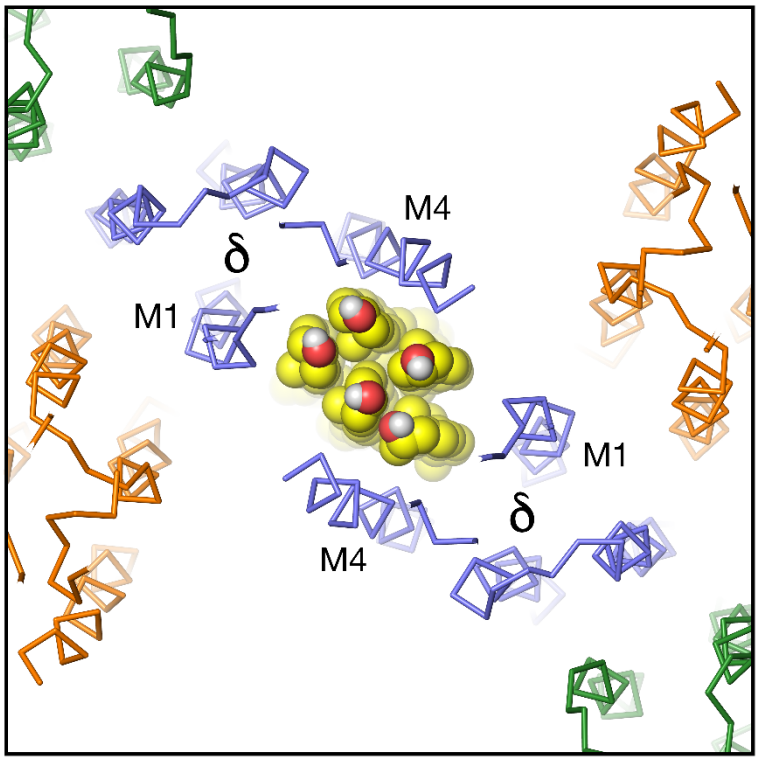

Figure S2 Hypothetical depiction of a cluster of five cholesterol molecules located in the microdomain space between the δ subunits of neighbouring receptors. The figure suggests that the microdomain, fully occupied, could harbour as many as eight cholesterols. The co-ordinates for the cluster were taken from a molecular dynamics simulation of a DOPC bilayer containing 30 mol % cholesterol (Wennberg *et al.*, 2012). The co-ordinates for the receptors were obtained by fitting the atomic model (PDB entry 2bg9) to the densities corresponding to a dimer in the 3D map; subunit colours as in Fig. 2 (α_{δ}, orange; β, green; δ, blue).