

**DIRECT MEASUREMENTS OF BILAYER HYDROCARBON CORE THICKNESS IN THE
PRESENCE OF MEMBRANE PROTEINS**

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The incorporation of transmembrane segments of both wild-type fibroblast growth factor receptor 3 and the achondroplasia-causing G380R mutant decreases the Bragg spacing of 1-Palmitoyl-2-Oleoyl-sn-Glycero-3-Phosphocholine (POPC) bilayers by 2 and 3 Å, respectively. In an attempt to understand the mechanism behind the observed decrease in Bragg spacing, deuterated POPC 16:0D31-18:1 PC was used to determine the bilayer hydrocarbon core thickness in neutron diffraction experiments. The results indicate that the hydrocarbon core thickness remains unchanged upon the incorporation of both peptides. The decrease in Bragg spacing is therefore likely due to change of water uptake, water distribution or headgroup rearrangement. These observations lead to the conclusion that the change in Bragg spacing of lipid bilayers is not an accurate indication of the change in hydrocarbon core thickness. Furthermore, the peak to peak distance in bilayer density profiles is not always a good reporter of hydrocarbon core thickness.