IUPUI Department of Physics Presents:

**Jacob Kinnun**  
**Department of Physics, IUPUI**

**Solid State $^2$H NMR Spectroscopy Reveals How PUFA Alter Membrane Structure**

Thursday,  
November 17, 2016* 4:15pm,  
LD 010  
402 N. Blackford Street

**Refreshments at 3:45 pm in the Physics Conference Room LD 154B**  
For additional information call 274-6900

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**Abstract:**

Fish oils rich in omega-3 polyunsaturated fatty acids (n-3 PUFA), such as docosahexaenoic acid (DHA, 22:6), have a wide variety of health benefits but a complete molecular mechanism is yet to be elucidated. One model postulates that highly disordered n-3 PUFA are incorporated into phospholipids in the plasma membrane and reorganize lipid rafts. Lipid rafts are ordered, nano-sized domains containing high amounts of sphingomyelin (SM) and cholesterol that when clustered together cause signaling proteins to become functional. To investigate this model, lipid bilayers composed of PDPC (a DHA-containing phospholipid) in mixtures with raft-forming SM and cholesterol (1:1:1 mol) were studied by solid-state $^2$H NMR using deuterated analogs. In my talk I will describe and demonstrate custom-made data processing and analysis software that was developed. Then I will present results indicating that PUFA-containing phospholipids both promote the clustering of lipid raft-like domains and infiltrate these ordered domains. Controlling the size and composition of lipid rafts may be an underlying role for PUFA in the plasma membrane.

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*Physics colloquium is scheduled for 2016-17 academic year for every Thursday, 4:15 PM in LD 010. Changes to the schedule will be posted at www.physics.iupui.edu*