SPIN TRAPPING THE OXIDIZED PRODUCTS OF PUFA IN MODEL MEMBRANES: THE PROTECTION CONFERRED BY VITAMIN E. **Cynthia D. Wassall¹**, William Stillwell² and Stephen R. Wassall¹ (Marvin D. Kemple¹⁾ Department of Physics¹ and Biology², IUPUI, Indianapolis, IN 46202

Electron paramagnetic resonance (EPR) spectroscopy is recognized as the most sensitive and noninvasive means to quantify free radicals of biological relevance such as reactive oxygen species (ROS). In spin trapping a molecule (the spin trap) reacts with the free radical producing a spin adduct that is sufficiently stable to be detected by EPR. Here we apply a novel spin trapping technique to investigate the protection that a-tocopherol (vitamin E), the major lipid soluble antioxidant in membranes, confers on polyunsaturated lipids in model membranes. Polyunsaturated fatty acids (PUFA) readily oxidize because they have a *cis,cis*-1,4-pentadiene motif that renders the central methylene group vulnerable to attack by ROS. Our method guantifies the oxidized products of PUFA in lipid vesicles that have been exposed to a peroxyl radical generator 2,2'-azobis-(amidinopropane) dihydrochloride (AAPH) that initiates the free radical chain reaction. By measuring the reduction in lipid peroxidation due to the presence of atocopherol, we test the hypothesis that the vitamin co-localizes with polyunsaturated lipids in membrane domains to ensure close proximity to the most vulnerable lipid species.