

**Pulse EPR detection of membrane domains**

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Molecular oxygen makes a particularly useful probe to study the organization and dynamics of membrane domains and particularly protein-rich raft domains. Our new method is based on variation of the local diffusion-concentration product of molecular oxygen in different membrane domains, thus is called the method of discrimination by oxygen transport (DOT method). Oxygen transport is evaluated by monitoring the bimolecular collision of molecular oxygen with different types of nitroxide lipid spin labels placed at various locations in the membrane. The collision rate is estimated from the spin-lattice relaxation times ( $T_1$ s), measured at various oxygen partial pressures, by analyzing the short pulse saturation recovery EPR signals. In general,  $T_1$ s are close in the absence of oxygen, and the presence of different types of lipid domains can often be clearly manifested only after introducing molecular oxygen into the sample.