

Insights into Structures, Interactions & Rearrangements

● Long Range Distance Measurements by EPR

DEER (also known as PELDOR) is a pulsed Electron Paramagnetic Resonance (EPR) technique to measure long distances (15-100 Å). The distances between pairs of paramagnetic centers are measured, in the case of biomacromolecules, most commonly pairs of spin labels (SL).

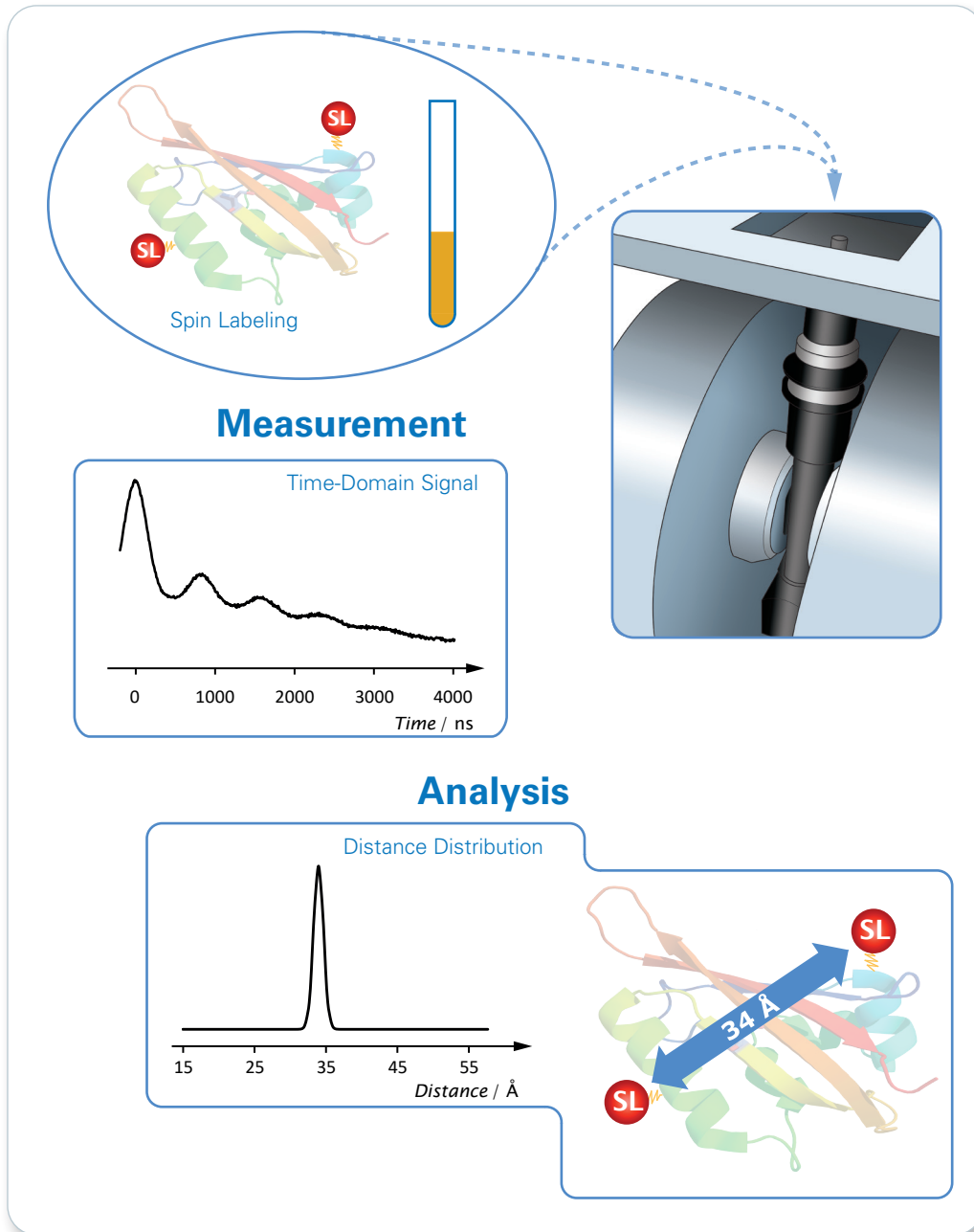
The DEER technique, measuring intra- and inter-protein distances, directly addresses structural topology, conformational rearrangements and interactions between biomacromolecules under conditions as close as possible to physiological ones.

Commonly used spin labels for site-directed spin labeling (SDSL) of biomacromolecules are nitroxide-based. The most popular is methanethiosulfonate spin label (MTSSL) due to its small molecular volume and its cysteine specificity.

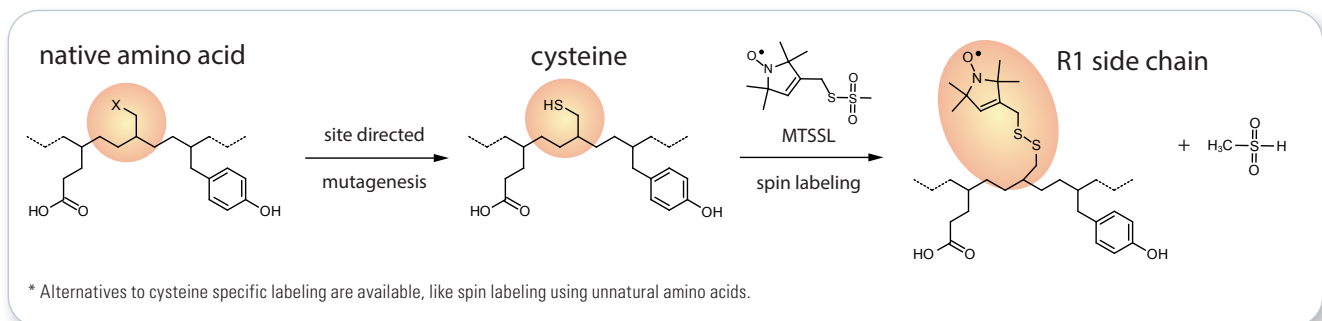
DEER: Double Electron Electron Resonance
PELDOR: Pulsed ELection electron DOuble Resonance

DEER complements other structural methods like X-ray, NMR, CryoEM and FRET adding crucial structure-function correlations and contributing to a deeper understanding of the function of biologically relevant systems at a molecular level.

Principles of DEER

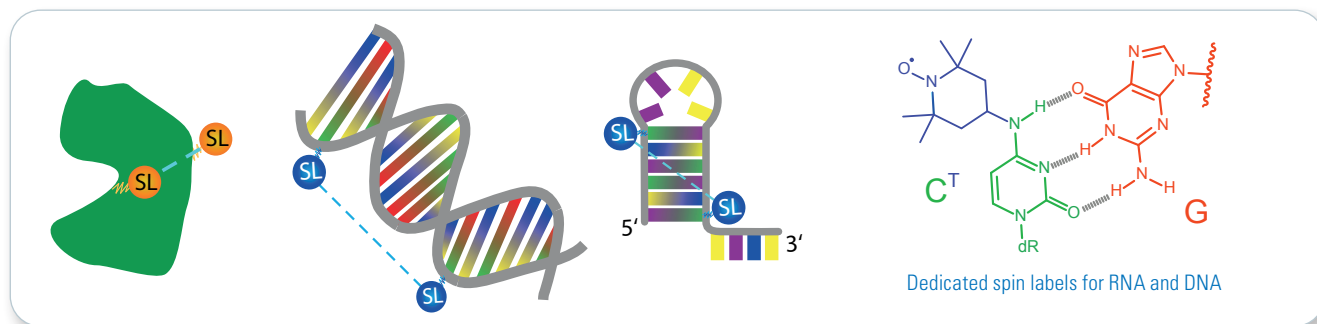


Site-Directed Spin Labeling

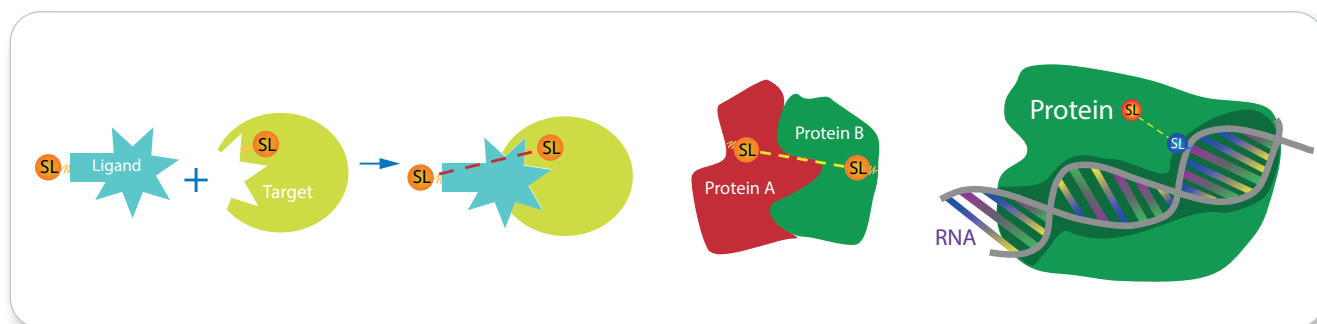


Without size limitations and in various environments (detergent, membranes or cells), DEER gives structural insight into:

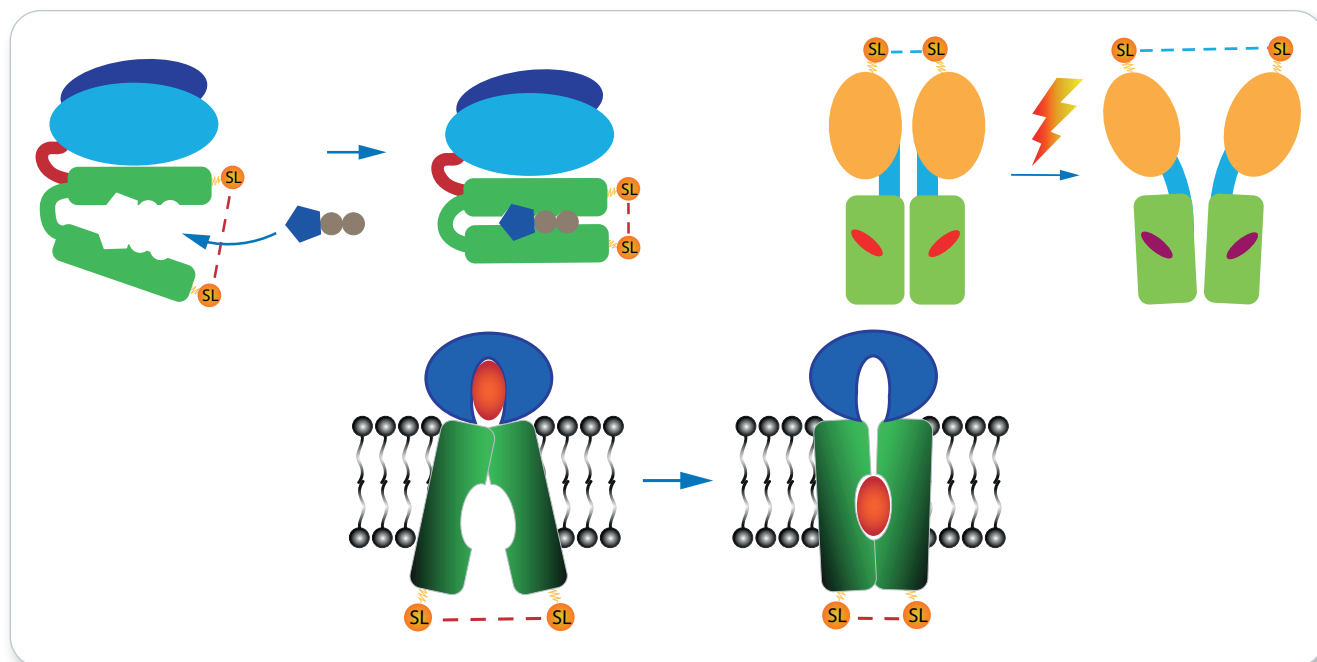
Structural topology



Interactions Between Biomacromolecules



Structural Rearrangements



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