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TRITYL RADICALS AS SPIN LABELS

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Abstract. In recent years, the combination of dipolar EPR spectroscopy with site-directed spin labeling (SDSL) has become a powerful method to study tertiary structure, dynamics and functional features of proteins, nucleic acids and nucleoproteins. Trityl radicals or TAMs have appeared recently as an alternative source of spin labels for measuring long distances in biological systems [1].

In this presentation we overview the advantages of spin labels based on TAM radicals will be shown of following examples:

(i) Investigation of the conformational changes of DNA with the apurinic/apyrimidinic sites (abasic or AP sites), which are one of the most common DNA lesions site and DNA complexes with human apurinic/apyrimidinic endonuclease one [2].

(ii) Development of spin labels based on the very hydrophilic OX063 with very-low toxicity and little tendency for aggregation. These new spin labels were tested on human serum albumin (HSA) as one of the most abundant protein in blood plasma. [3]

(iii) Development of C_{60}-based label for dipolar EPR spectroscopy using model covalent pairs of C_{60} with trityl (C_{60}-TAM) radicals having long phase relaxation time up to room temperature [4].

(vi) Synthesis of novel TAM-nitroxyl biradicals of different structure and their application as DNP agent [5].

(vii) Development of distance measurements based on ^{19F} ENDOR and TAM in model system and biomolecules [6].

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