ORIENTATIONAL AND CONFORMATIONAL CHANGES IN TRANSMEMBRANE DOMAINS OF MEMBRANE PROTEINS

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A large number of soluble proteins have been crystallized and this knowledge has contributed undoubtedly to a molecular understanding of their mode of action Membrane proteins represent 20-30% of the proteins of the genome and only a few have been crystallized. It becomes quite urgent to gain information about their tertiary structure. The lipid environment and its anisotropic organization restricts drastically the use of methods that work efficiently in an isotropic environment. To overcome some of these difficulties, new experimental approaches have been developed to gain information on the structural changes occurring in membrane proteins and in transmembrane domains that plays a determining role in transport, signalling. We examine here and illustrate with examples how infrared and fluorescence spectroscopy can provide new insights into the structure and orientation of the membrane domains of transporters in particular and how ligand-protein interaction can affect the structure and orientation of transmembrane domains. Such methods opens also new possibilities for the detection of conformational changes that are transmitted from the cytosolic domains to the transmembrane domains and vice-versa. How lipid micro-domains modify the transmembrane structural parameters is another challenge that can be addressed.

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