The Role of the C2 domain in the spatial localization of Protein Kinase C-θ.

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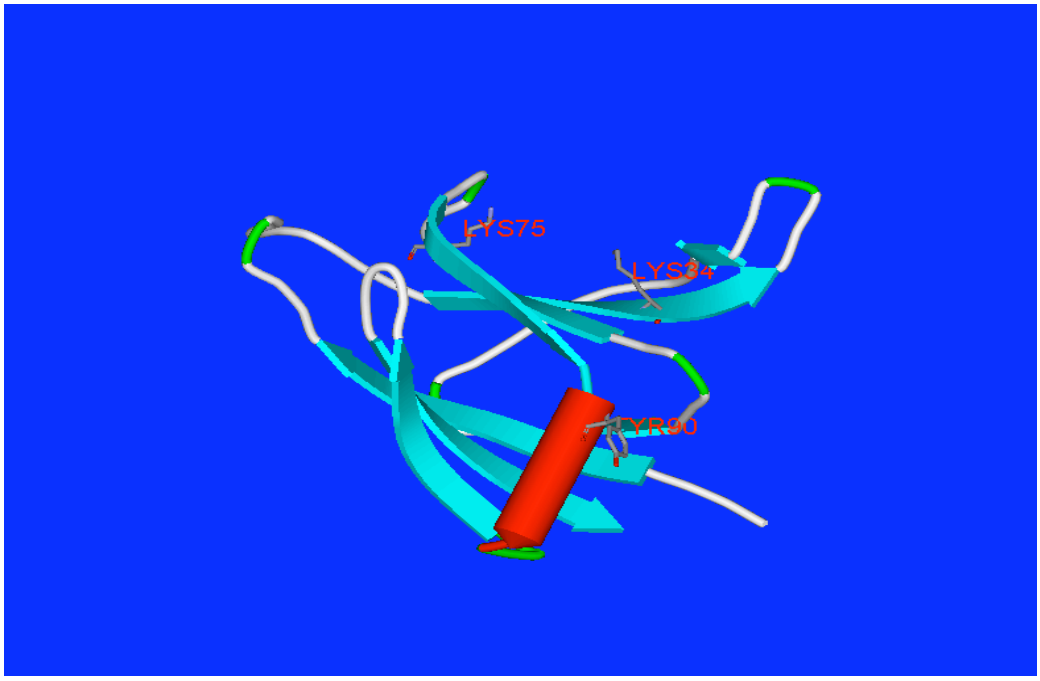
Protein Kinase C (PKC) is a family of serine- and threonine- specific protein kinases that phosphorylate a variety of protein targets, which are mainly involved in cellular signaling pathways. The PKC family consists of three groups: conventional PKC (cPKC: α, βI, βII, and γ-isotypes), novel PKC (nPKC: δ, ε, η, and θ-isotypes) and atypical PKC (aPKC: ζ, ι/λ-isotypes). The mechanisms for activation and translocation are different for each group. Our studies are focused on the nPKC-θ.

Studies have shown that the nPKC-θ plays an integral role in immune response. Upon presentation of an antigen to an immune cell, more specifically a T cell, a signaling complex forms which is known as the immunological synapse (IS). The biological function of this protein depends largely on its spatial localization in the central region of the IS of T cells.

The membrane targeting of PKCs is mediated by membrane-targeting domains; such as the PKC conserved 1 (C1) and PKC conserved 2 (C2) domains. Our biophysical studies are investigating the mechanism of the selective translocation of PKC-θ and the role of its C2 domain.



Model structure of the C2 domain of PKC-θ.