

## **Mechanism of intracellular lipid transport –Structure and function of $\alpha$ -tocopherol transfer protein–**

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$\alpha$ -tocopherol, the most biologically active form of vitamin E, is a lipid-soluble antioxidant, which can inhibit the peroxidation of membrane lipids.  $\alpha$ -tocopherol is widely distributed throughout the mammalian tissues, where it is found in the membranes of intracellular organelles. The mechanism by which  $\alpha$ -tocopherol is transported to intracellular organelles has not yet been clarified.  $\alpha$ -Tocopherol transfer protein which facilitates the transfer of this vitamin between membranes was detected in rat liver cytosol by us and others. We have recently succeeded in purification of  $\alpha$ -tocopherol transfer protein and showed that the protein has Mr. of about 30 kDa and is composed of two charge isomers. Furthermore, we have isolated the cDNA encoding  $\alpha$ -tocopherol transfer protein and deduced the primary amino acid sequence. The protein is unique and is not identical to any other proteins ever reported. Both Western and Northern blot analyses revealed that  $\alpha$ -tocopherol transfer protein is expressed exclusively in the liver in rats. Surprisingly,  $\alpha$ -tocopherol transfer protein has been found to exhibit a structural homology with the cellular retinal binding protein present only in retinal epithelial cells and with SEC 14 protein that bind to and transfer specifically phosphatidylinositol and phosphatidylcholine. These three proteins may form a new family of lipid binding/or transfer proteins.