

1-4

Mecahnism of Fatty acid transfer from FABP to membranes

Hyekyung Kim and Judith Storch Harvard University, Dept. of Nutrition.

Fatty acid binding proteins (FABP) are a family of 14-15 kDa proteins found in many tissues in a high abundance. Although the precise physiological function of FABPs remains hypothetical, the transfer of ffa to intracellular membrane sites is believed to be an important function of FABP. To better understand the role of FABP in this process, we have examined the transfer of fluorescent ffa from FABP to membranes.

Method Liver and heart FABP was purified from adult male sprague-dawley rats. Small unilamellar vesicles were prepared from 90 % EPC and 10 mol % NBD-PE. The rate of transfer of ffa to membranes was monitored using a resonance energy transfer assay.

Results 1) There is a striking difference in ffa transfer from liver vs. heart FABP to membrane, with transfer from heart being markedly faster than from liver FABP 2) unsaturated and shorter chain ffa transfer more rapidly from L-FABP to membranes while shorter chain ffa transfer more slowly, and unsaturation of the acyl chain has no effect on ffa transfer from H-FABP 3) the mechanism of ffa transfer from L-FABP to model membrane is via diffusion while ffa transfer from H-FABP is via collisional interaction between protein and membranes 4) the FABP affects ffa transfer rate, mechanism of ffa transfer, and targetting toward different organelles.

Reference

1. Storch, J. and N.M. Bass. J. Biol. Chem. 265:7827-7831, 1990
2. Bass, N.M. J. Biol. Chem. 260:1432-1436, 1985

key ward: fatty acid binding protein, fatty acid transfer, model membrane, diffusion, collision