Lecture 17b

3/5/2020

Lipid Degradation/ Fatty Acid Degradation

Dietary fatty acids are absorbed in the vertebrate small intestine

Bile salts → lipases → chylomicrons → blood/lymph

Apoliproteins on the chylomicrons (d = 1 micron)

Used by muscle/Stored by adipose; recognize apolipoproteins→ activate lipases

4 stages of Fat Catabolism

1) Mobilization from tissues (mostly adipose)

   Lipases are activated by hormones e.g., glucagon, epinephrine Net production of ATP

   Activate Protein Kinase A via cAMP

   Fats get degraded into fatty acids and glycerol (from triglycerides)

   Three lipases are used

   Transported to other tissues via blood

   Glycerol (hydrophobic/polar)

   Glycerol (sugar alcohol) → L-Glycerol-3-phosphate → Dihydroxyacetone phosphate
   (Glycerol Kinase; glycerol-3-phosphate dehydrogenase)

   Glycerol Kinase activates glycerol at the expense of ATP

   Fatty Acids

2) Activation of fatty acids

   Fatty acyl-CoA synthetase; use of ATP→AMP (like amino-acyl tRNA synthetases)

3) Transport

   Acyl-carnitine/Carnitine Transport