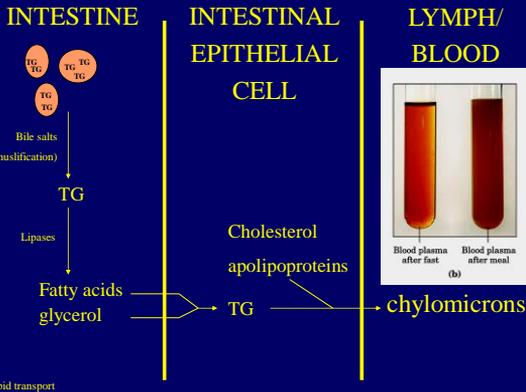
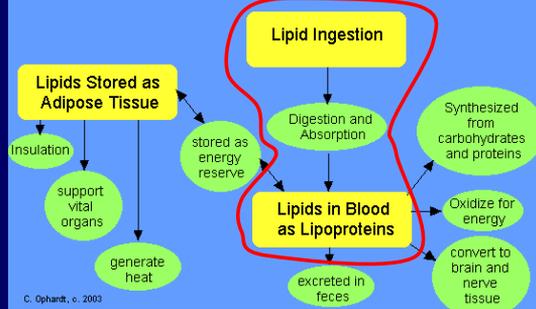


Aims

1. Outline the structural diversity of lipids.
2. Examine the biophysical characteristics of lipids.
3. Outline the biochemical synthesis of fatty acids, triglycerides and phospholipids.
4. **Examine lipid transport through the body.**
5. Outline the process of fatty acid beta-oxidation.
6. Compare the amount of energy from fatty acid and glucose oxidation.

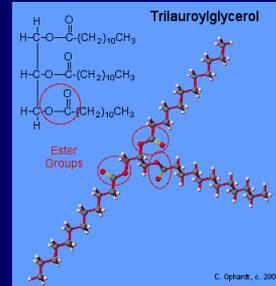
Lipid Metabolism

Lipid Function and Metabolism Summary



Lipid Metabolism

- Digestion - Hydrolysis Reaction (Pancreatic lipases)



LIPID TRANSPORT

- Lipids are transported in the blood as lipoproteins

Lipids:

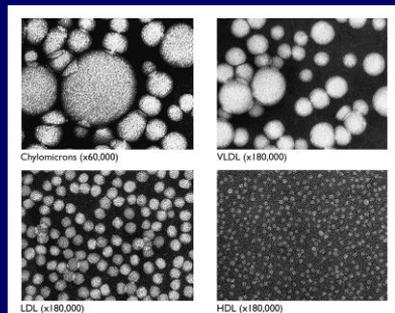
Cholesterol

Apolipoproteins + Cholesteryl esters → lipoproteins

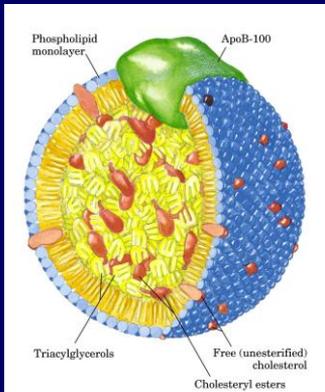
Triacylglycerols

Phospholipids

- There are 4 types of lipoprotein



LDL



Lipid transport

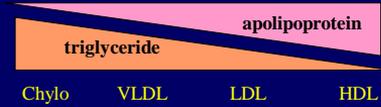
The lipoprotein formed depends on the constituent apolipoprotein and lipids

Table 21-2

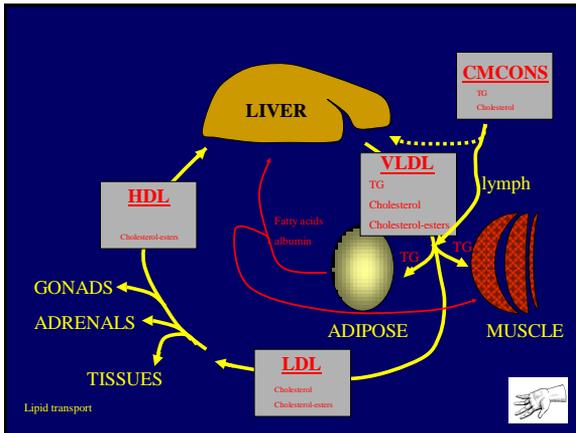
Major Classes of Human Plasma Lipoproteins: Some Properties

Lipoprotein	Density (g/mL)	Protein	Phospholipids	Composition (wt %)		
				Free cholesterol	Cholesteryl esters	Triacylglycerols
Chylomicrons	<1.005	2	9	1	3	85
VLDL	0.95-1.006	10	18	7	12	50
LDL	1.006-1.063	23	20	8	37	10
HDL	1.063-1.210	55	24	2	15	4

Source: Modified from Kritchevsky, D. (1986) Atherosclerosis and nutrition. *Nutr. Int.* 2, 290 - 297.



Lipid transport



Lipid transport

Atherosclerosis – fatty plaques in blood vessels

- High blood cholesterol – LDL receptor / hypercholesterolaemia
see Lehninger p811 for more info.
vessel occlusion – heart attack!
- High levels of LDL – probably bad
- High levels of HDL – probably good

Lipid transport