

M U N I
S C I

C5730 Biochemie - seminář

Mgr. Lukáš Faltinek

podzim 2023

M U N I
S C I

Metabolismus lipidů

METABOLIC PATHWAYS

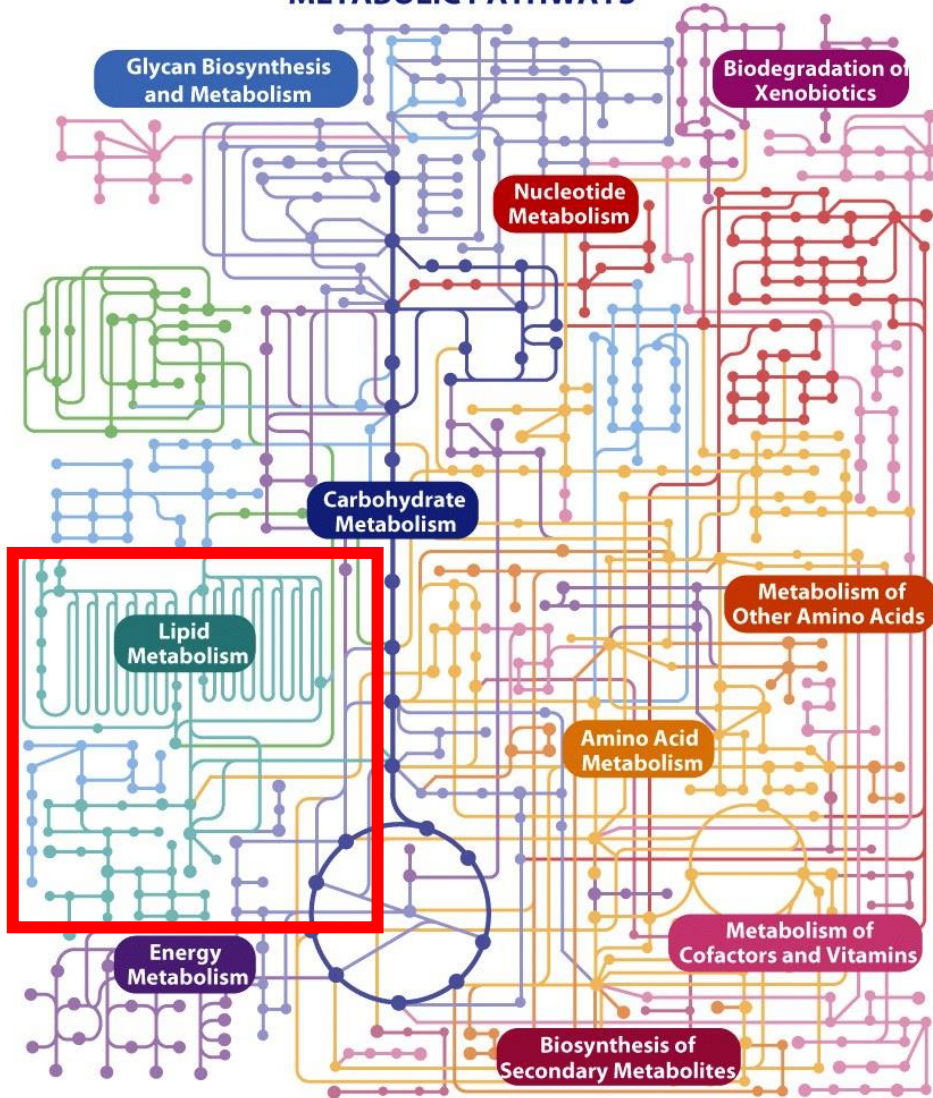
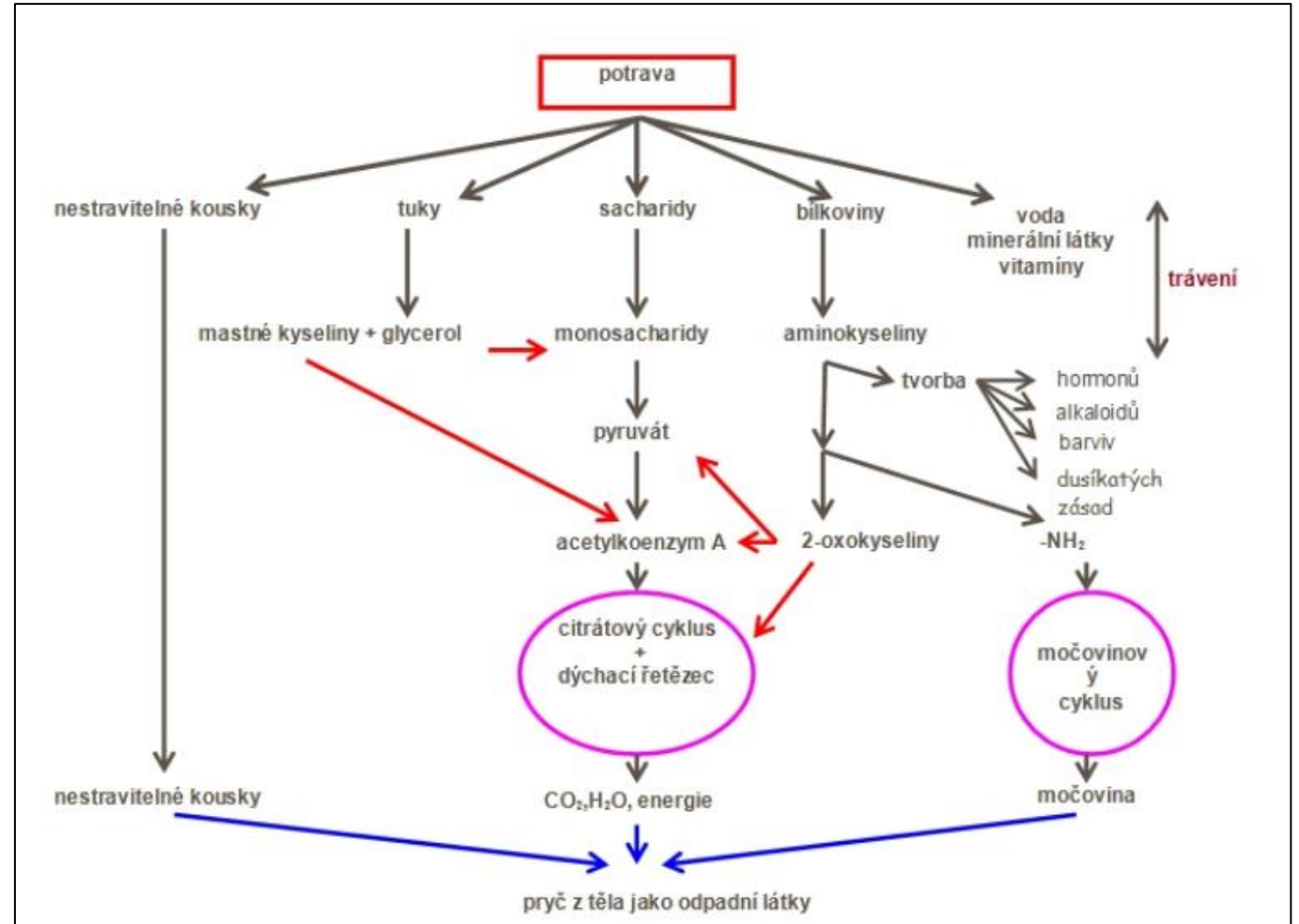
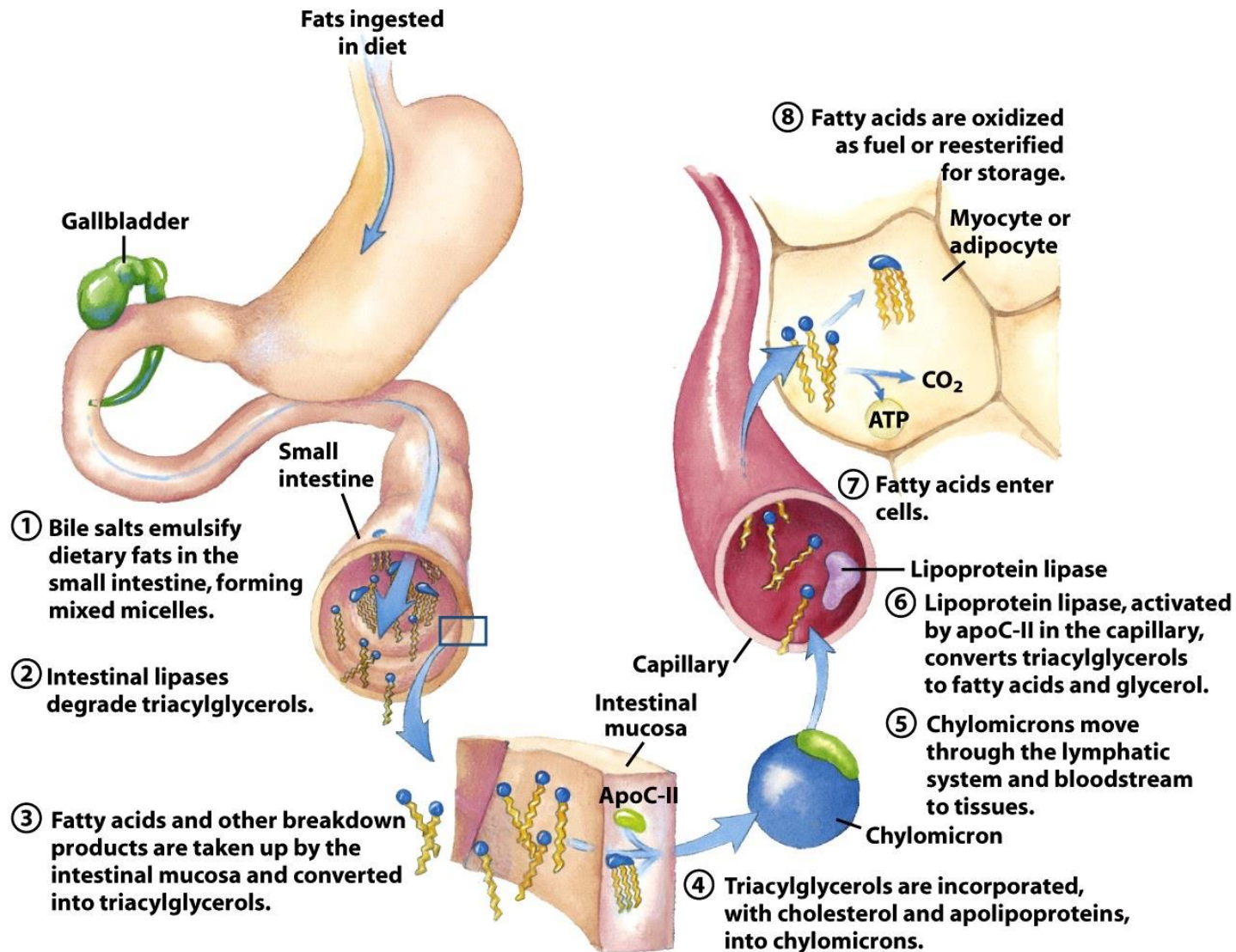


Figure 15-1
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<http://www.studiumbiochemie.cz/metabolismus>



Zpracování lipidů z potravy

Figure 17-1
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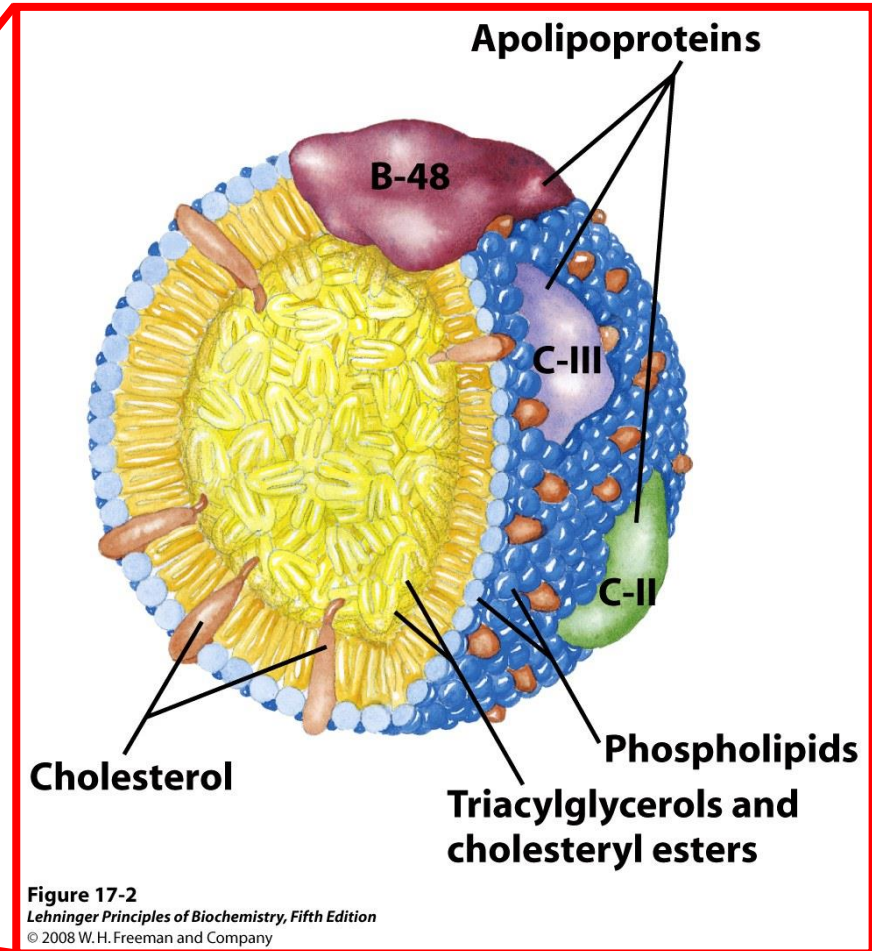
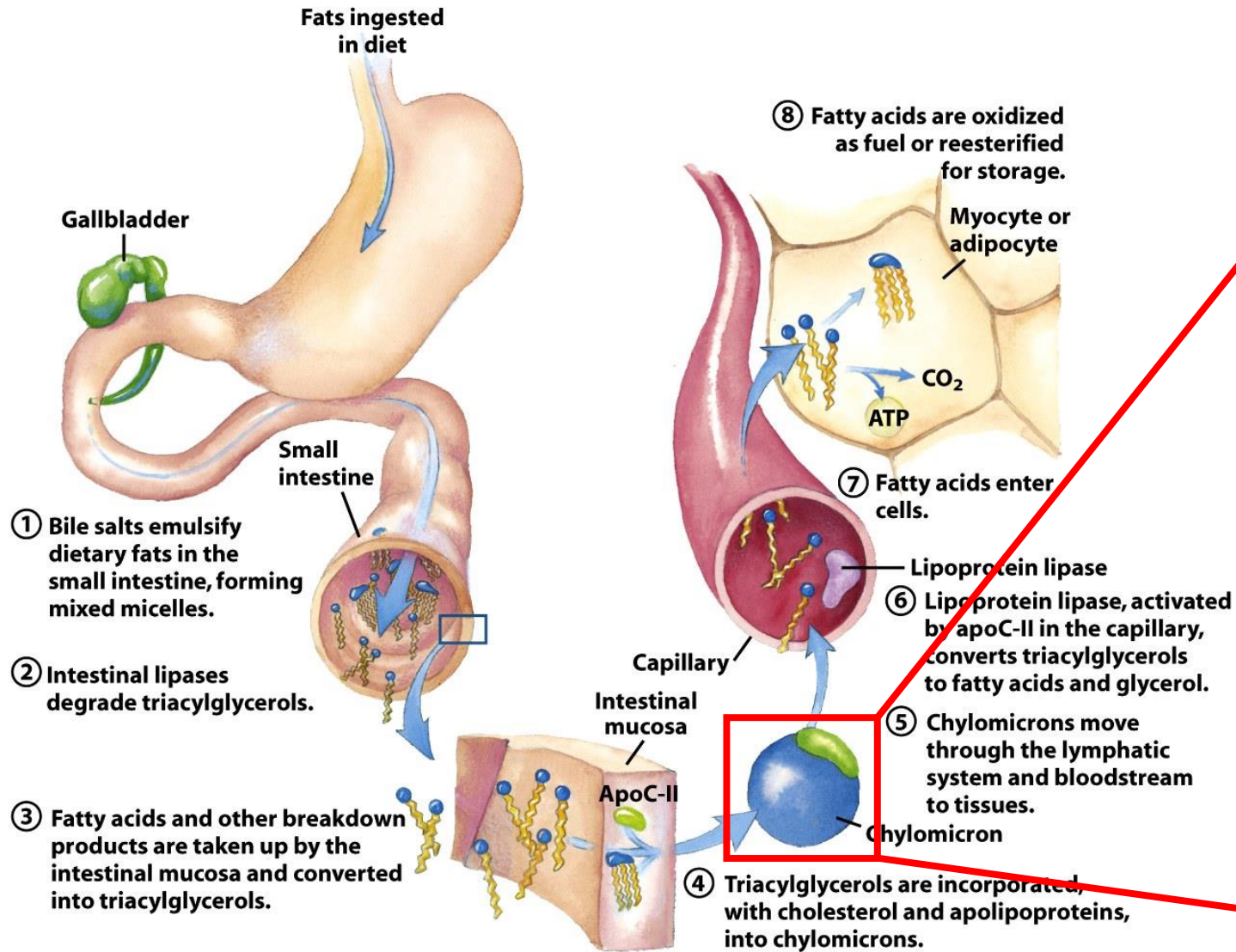
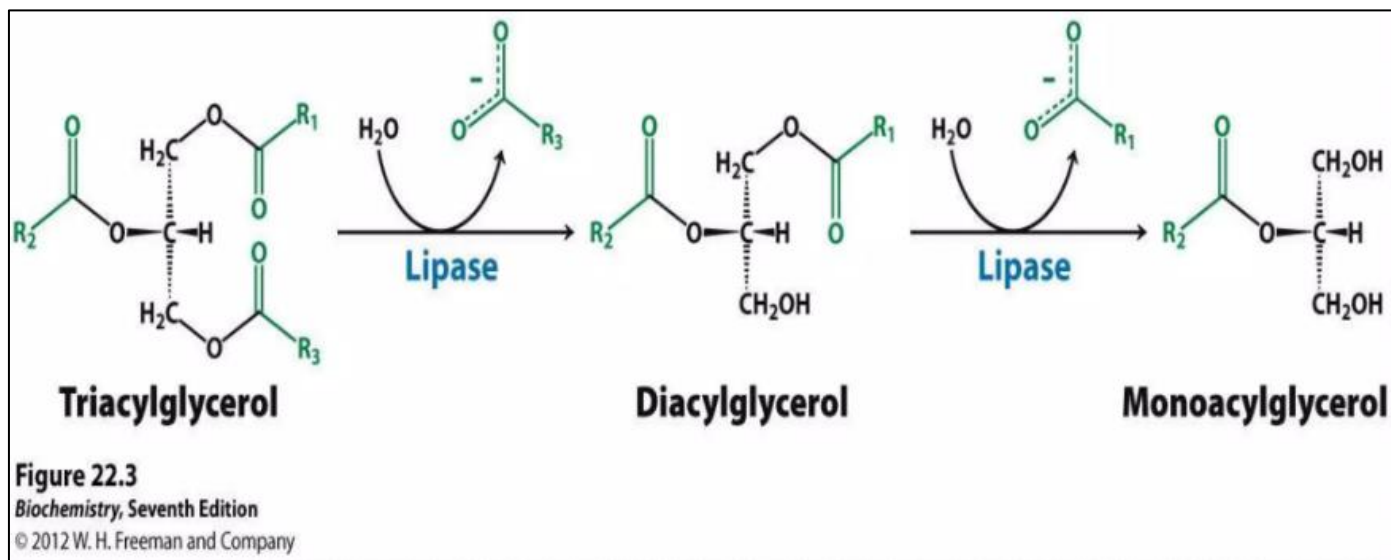
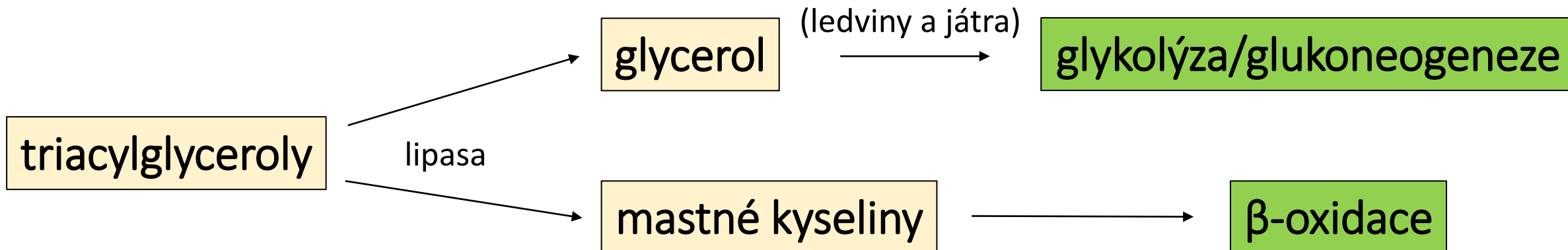


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Lipolýza



Využití glycerolu

- přeměna glycerolu na meziprodukt glykolýzy
- glykolýza:
 - přeměna glyceraldehyd-3-P na pyruvát
- glukoneogeneze:
 - přeměna glyceraldehyd-3-P na glukosu

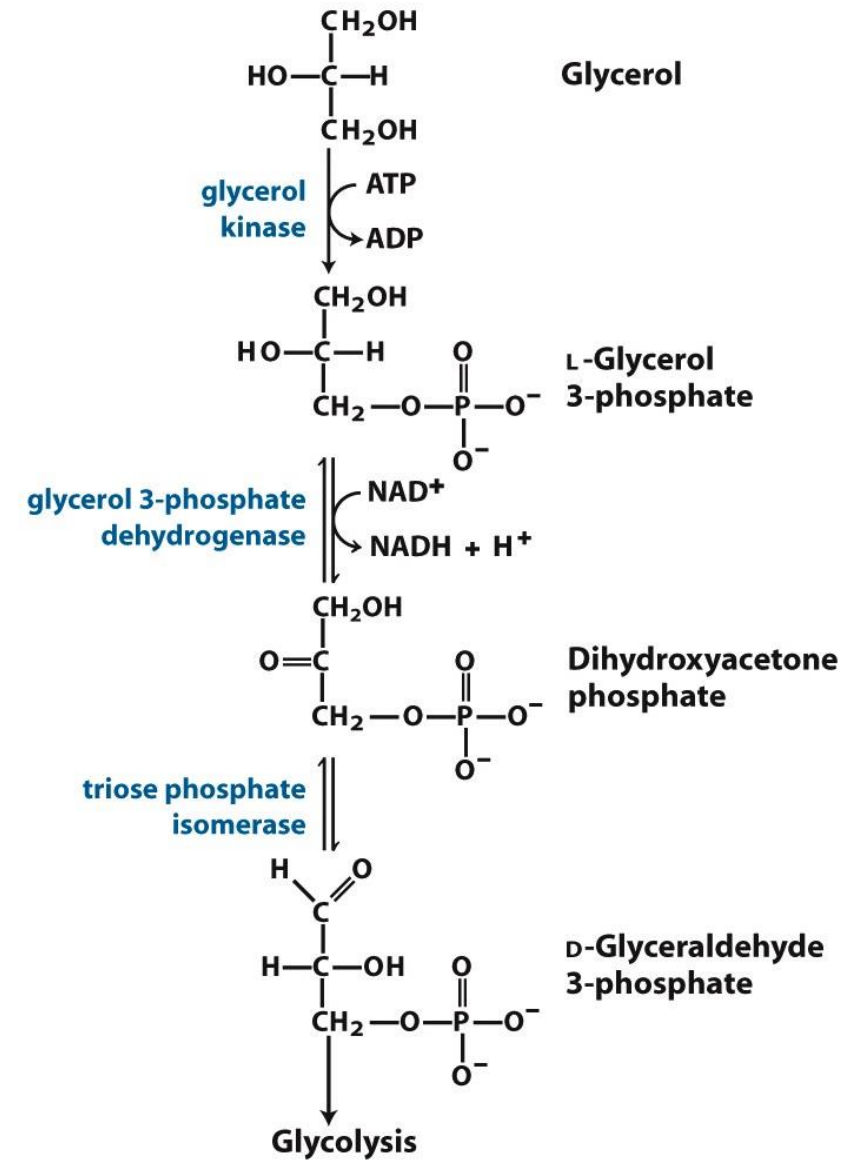
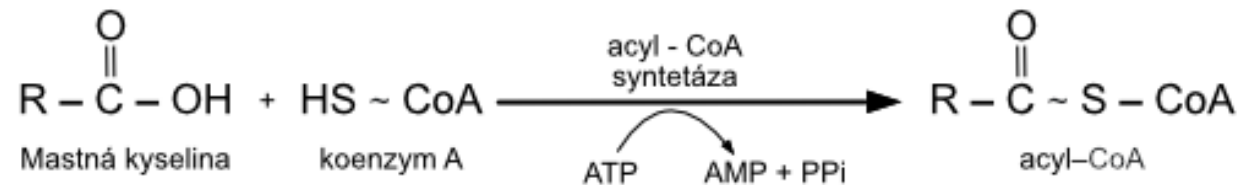


Figure 17-4
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Aktivace mastných kyselin

- mastné kyseliny se musí dostat do matrix mitochondrií, kde probíhá jejich degradace
- vstup do mitochondriální matrix umožněn pouze aktivovaným mastným kyselinám



Aktivace mastných kyselin

- ve skutečnosti dvoufázový proces
- meziproduktem je acyl-adenylát

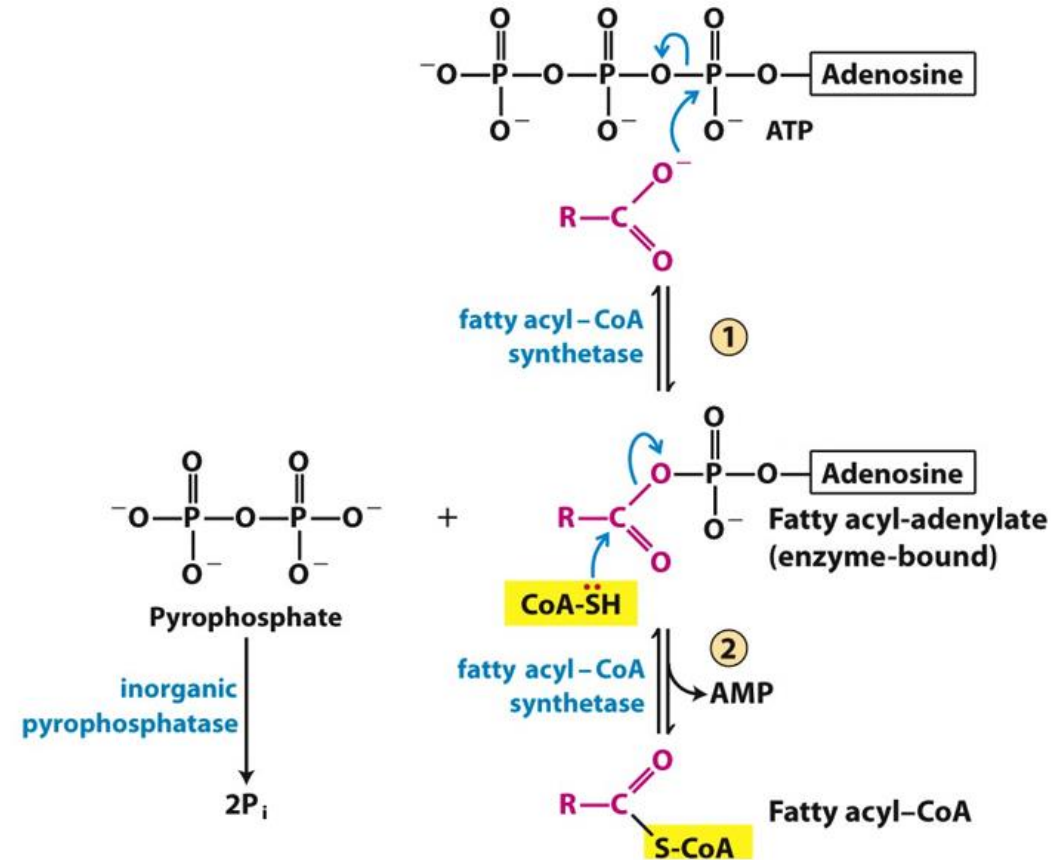


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Karnitinový transportní systém

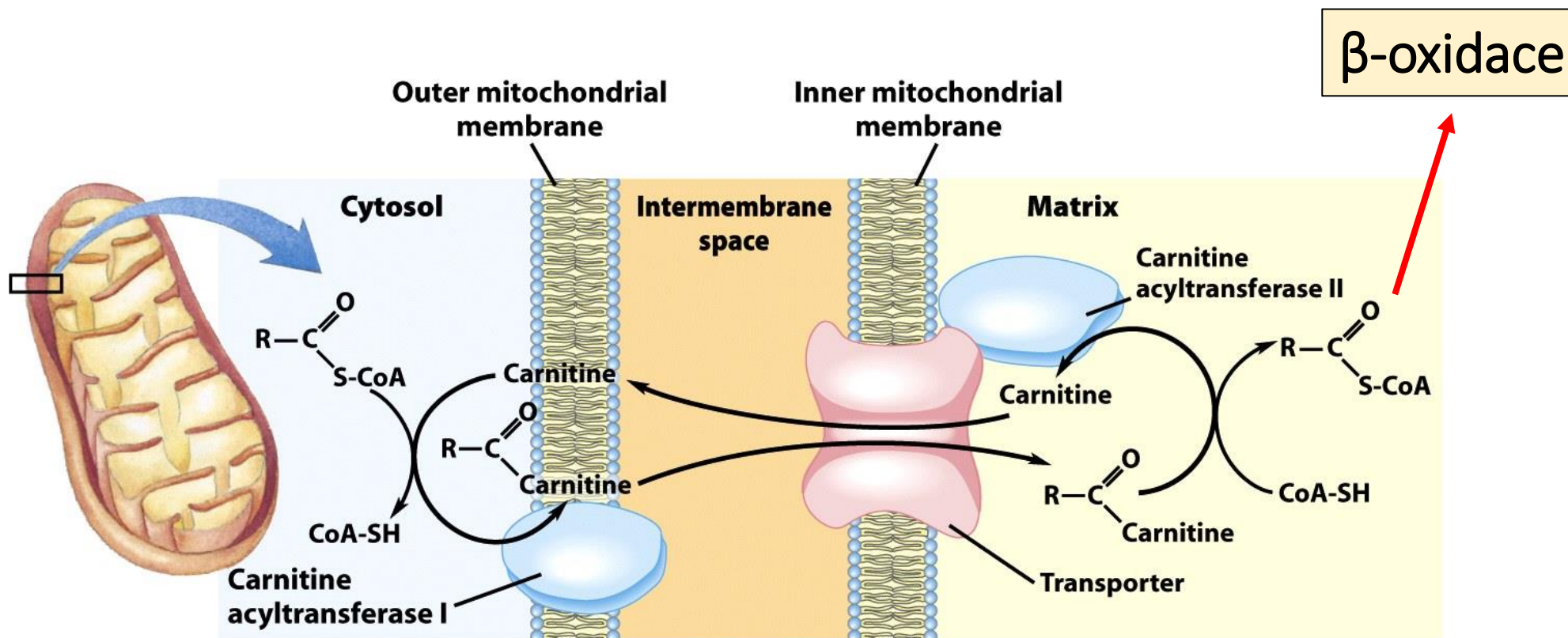
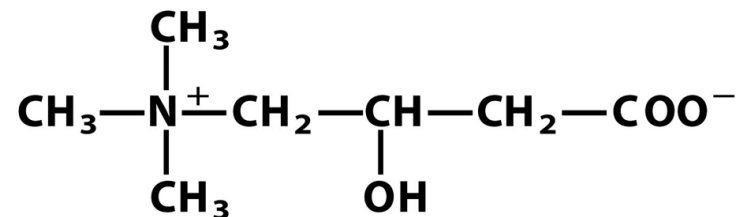


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β -oxidace

C_n

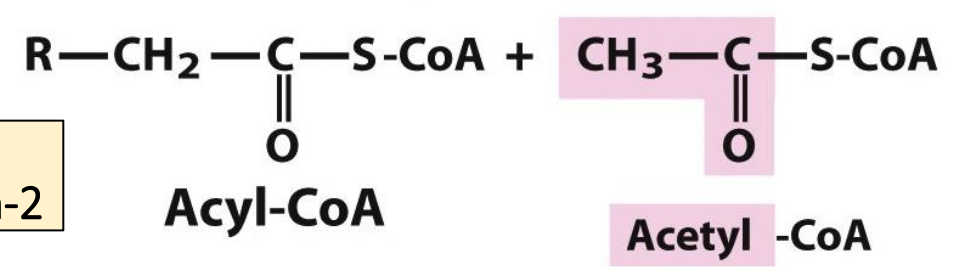
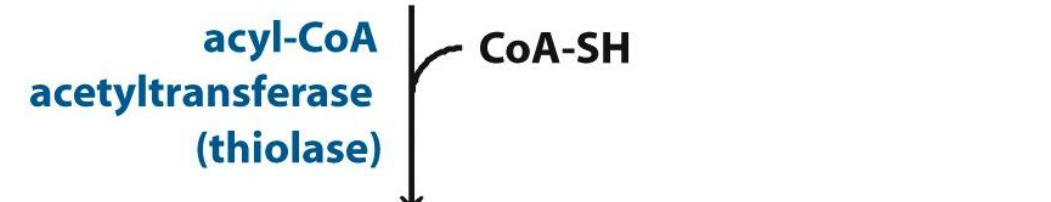
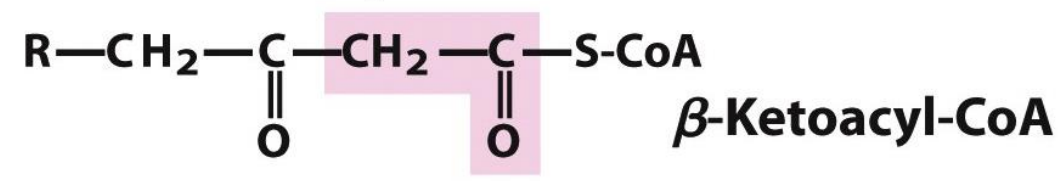
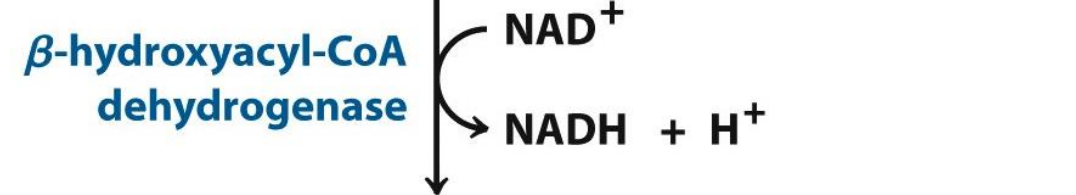
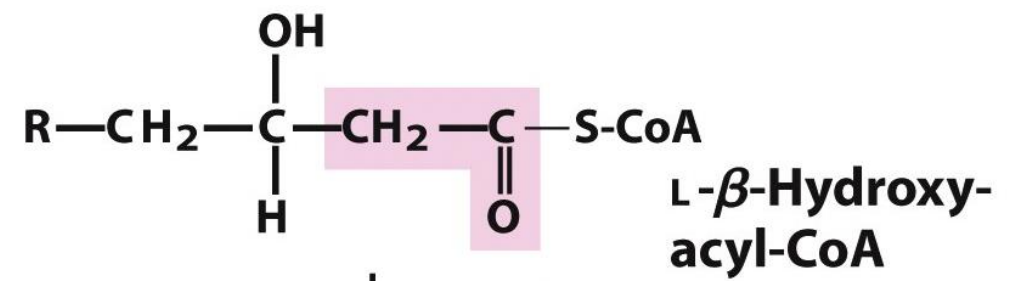
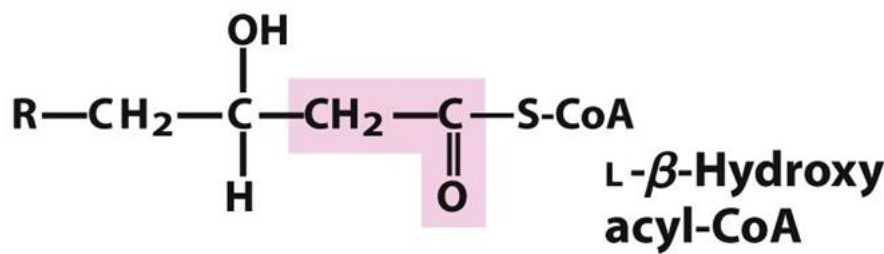
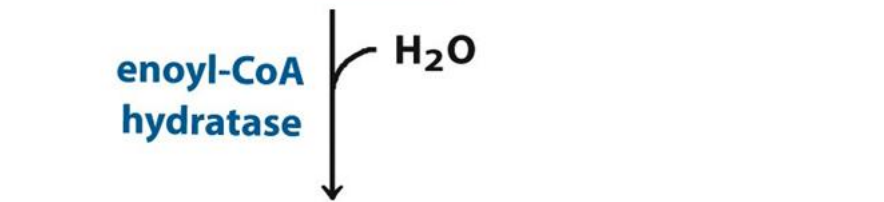
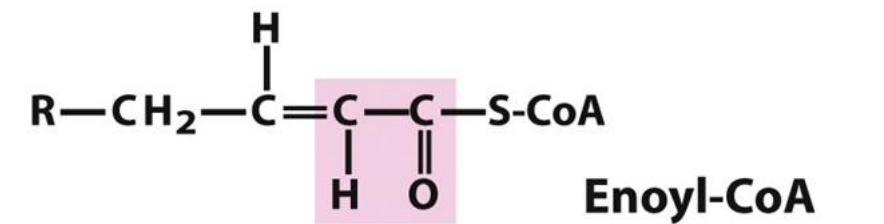
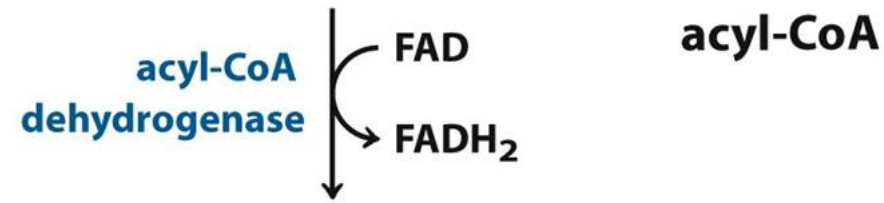
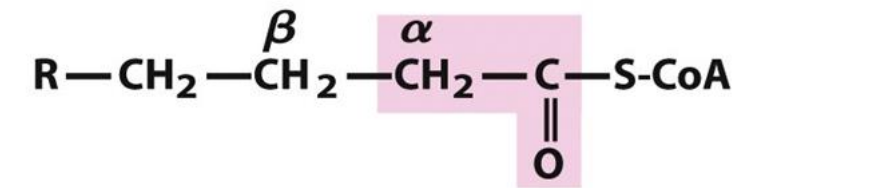
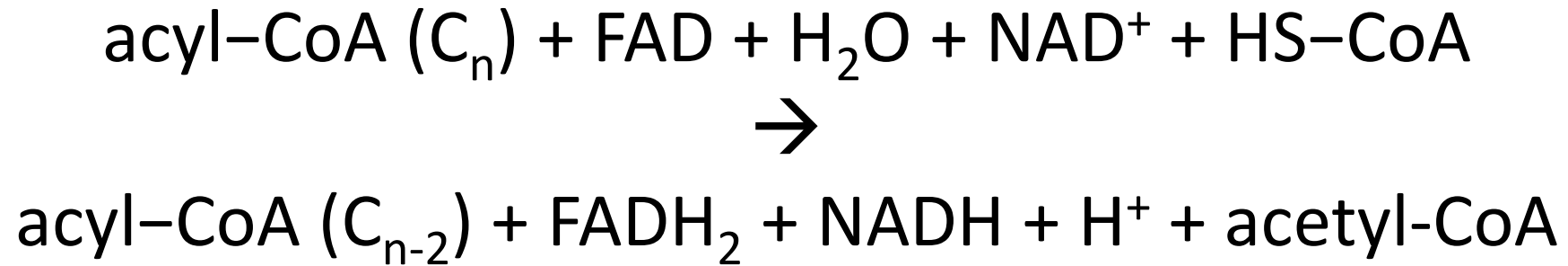
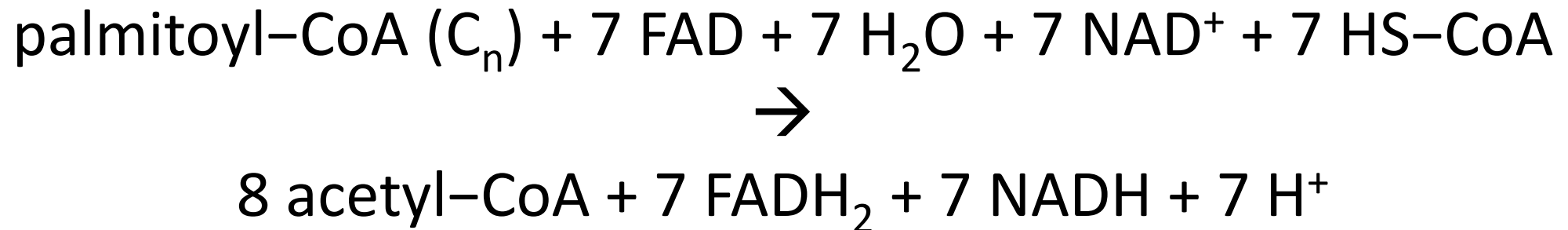


Figure 17-8a part 1
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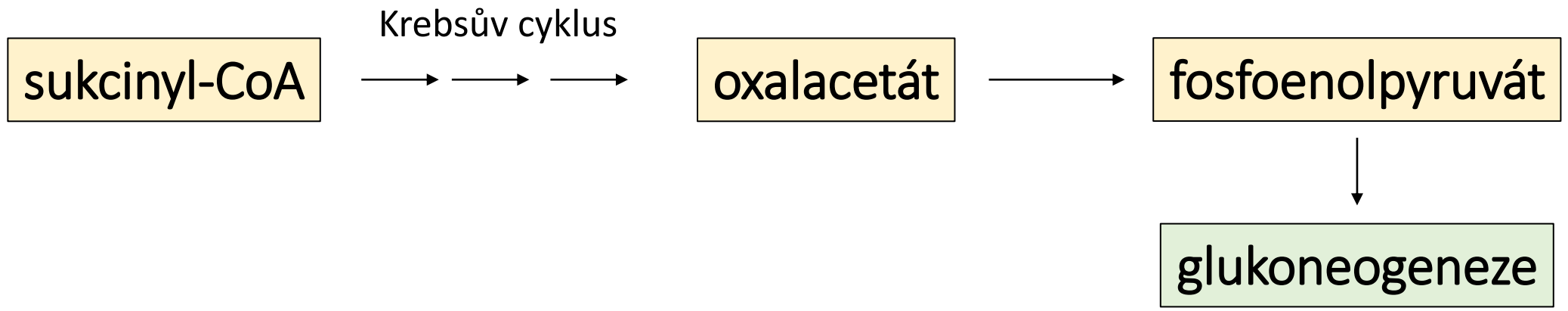
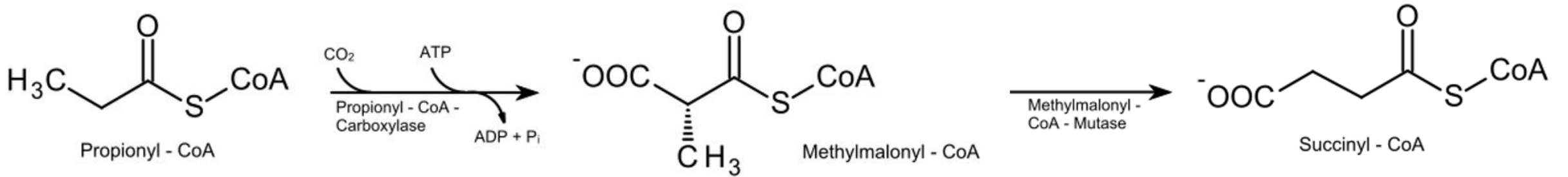
β -oxidace: souhrnná rovnice



Kyselina palmitová (C₁₆)

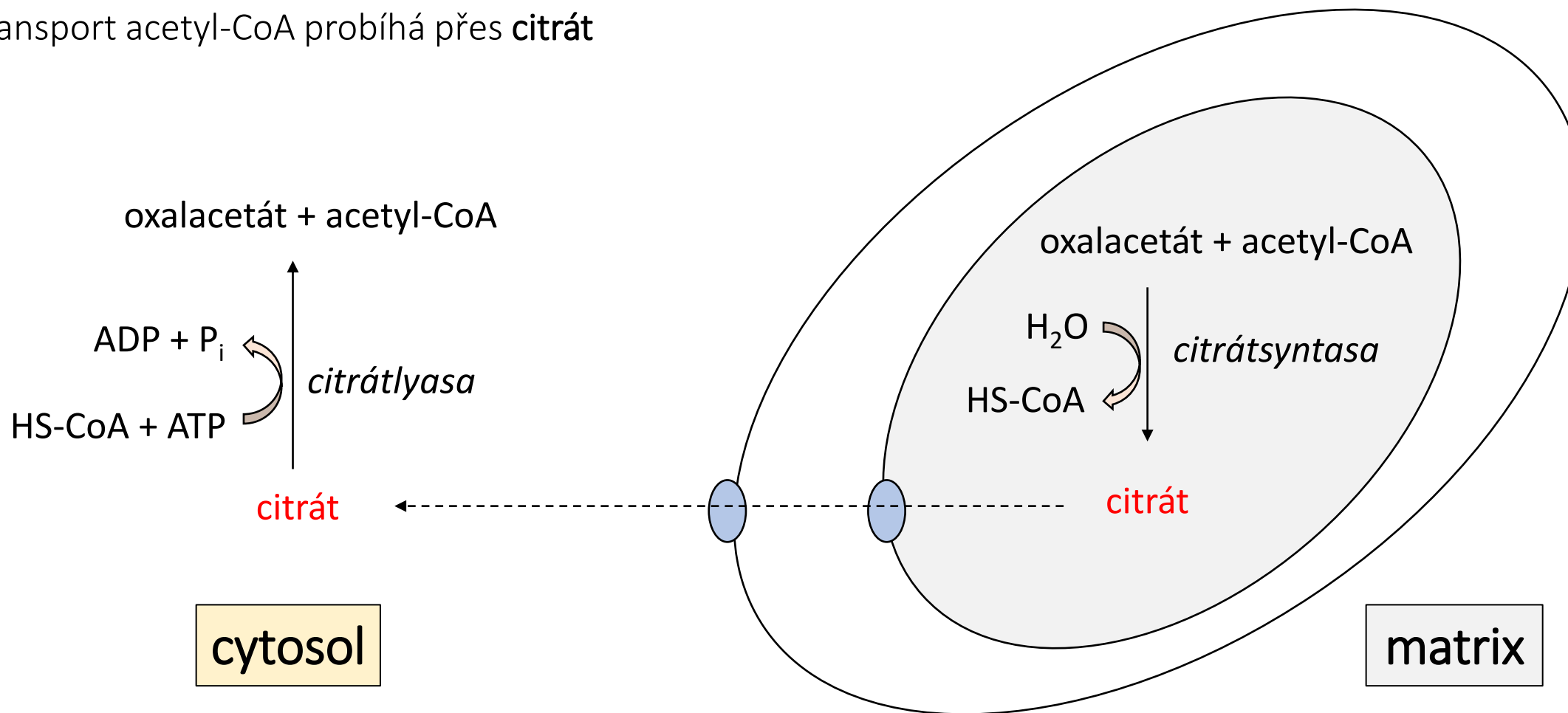


Mastné kyseliny s lichým počtem uhlíků



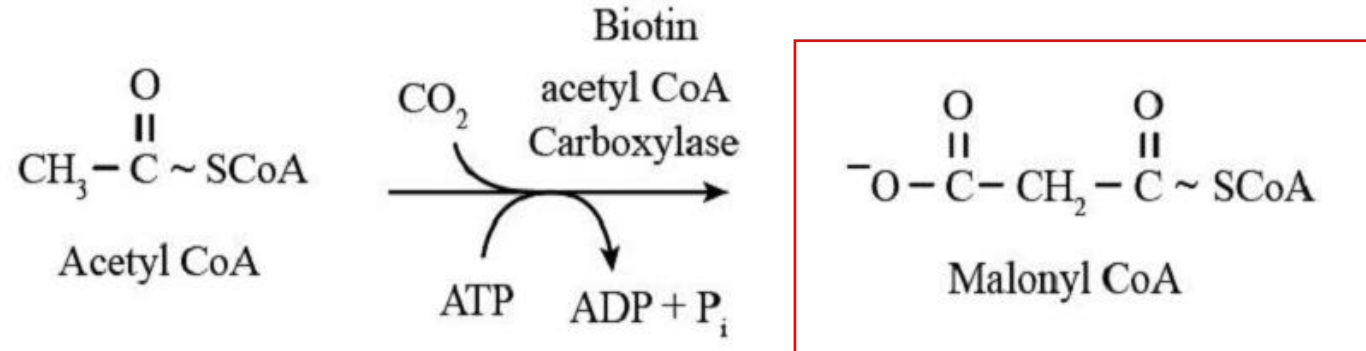
Syntéza mastných kyselin

- probíhá v cytosolu buněk (acetyl-CoA musí být dopraven z mitochondriální matrix do cytosolu)
- transport acetyl-CoA probíhá přes **citrát**



Tvorba malonyl-CoA

- aby mohla probíhat syntéza mastných kyselin, je potřeba acetyl-CoA přeměnit na malonyl-CoA
- sám malonyl-CoA vystupuje jako regulační složka β -oxidace (brání asociaci MK s karnitinem)



Syntéza mastných kyselin

- meziprodukty syntézy MK jsou vázány na tzv. acyl carrier protein (ACP, protein přenášející acyly)
- enzymy syntézy MK jsou spojeny do multienzymového komplexu zvaného syntasa MK
- NADPH je donorem elektronů

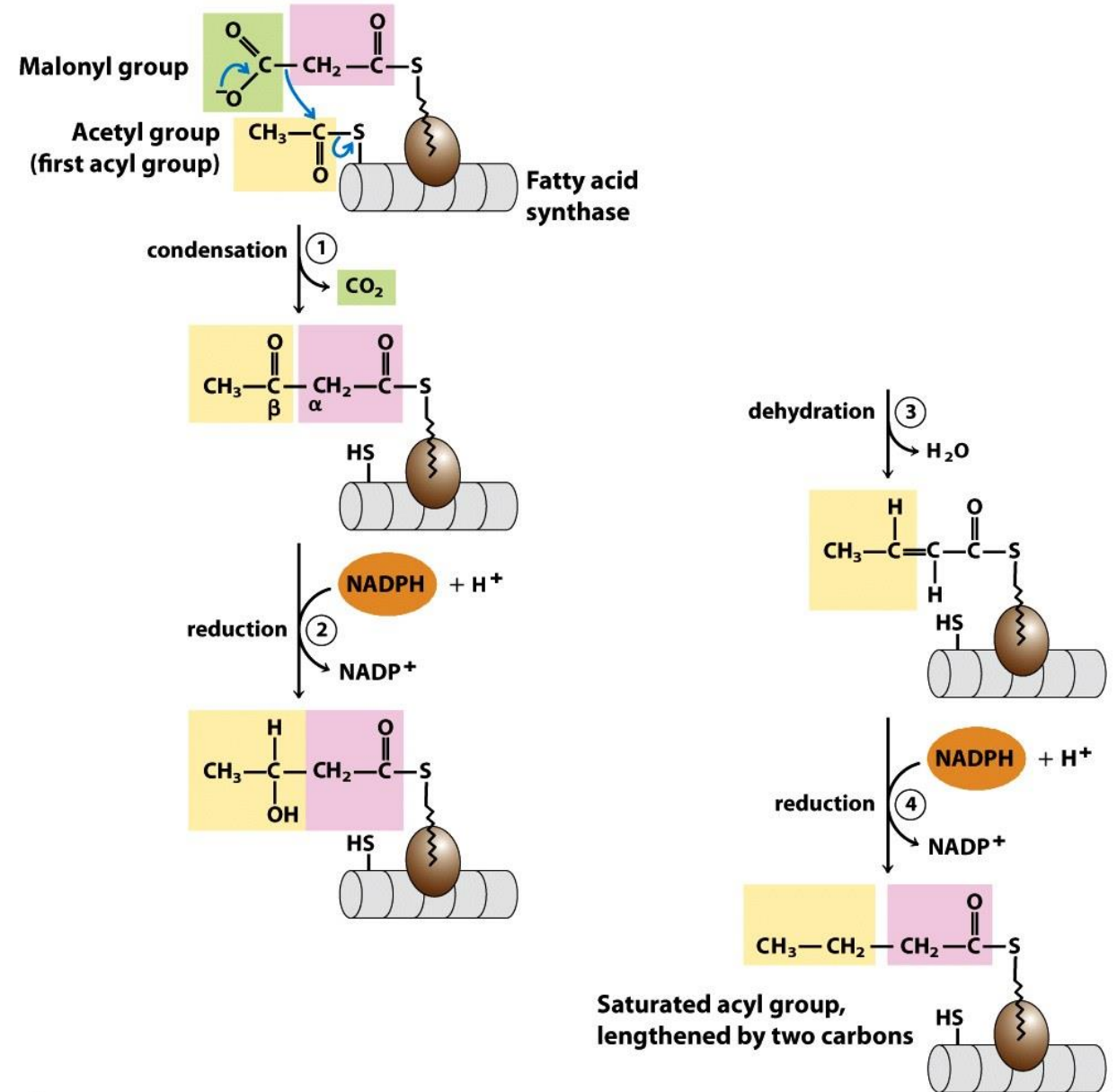
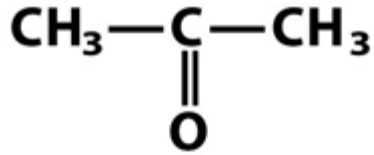
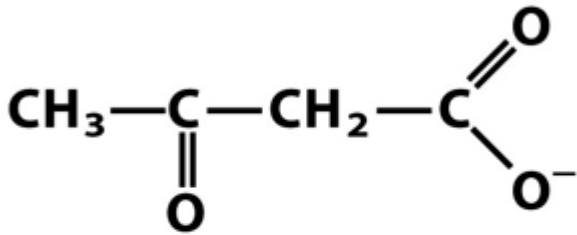


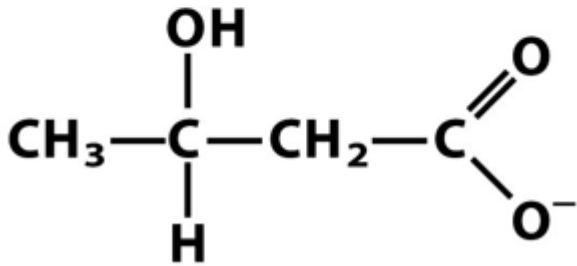
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aceton



acetoacetát



β-hydroxybutyrát

Ketolátky

biosyntéza cholesterolu

mevalonátová dráha

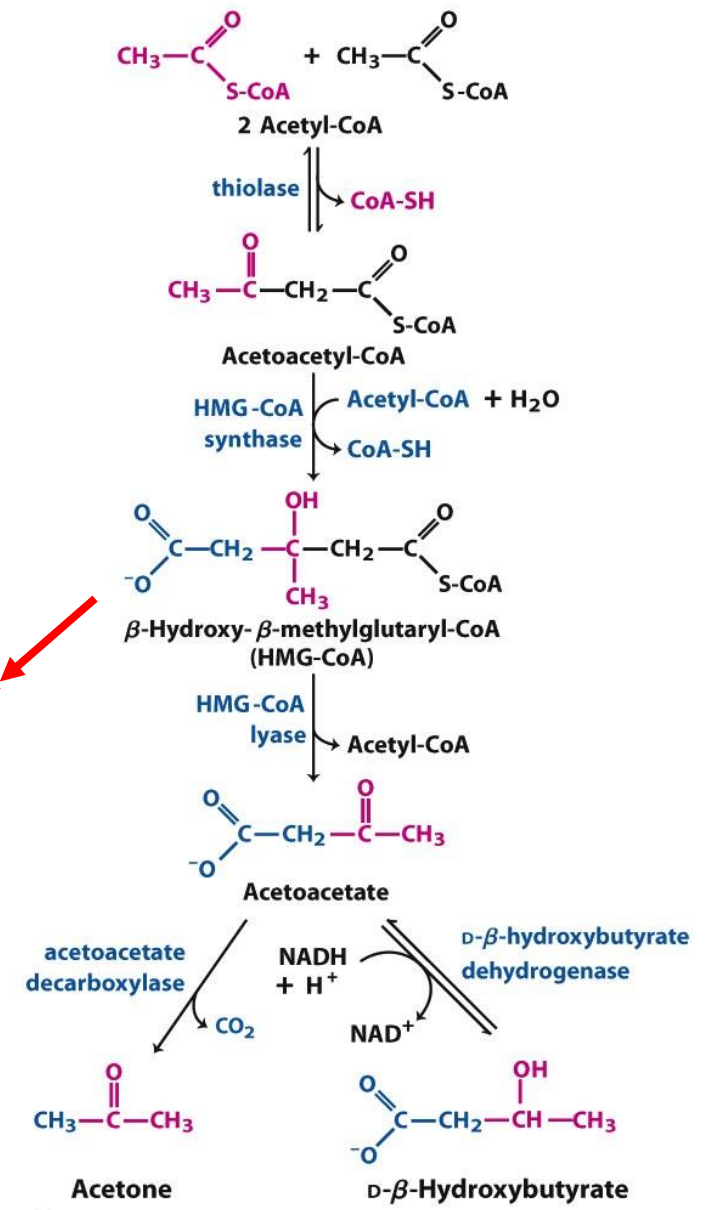


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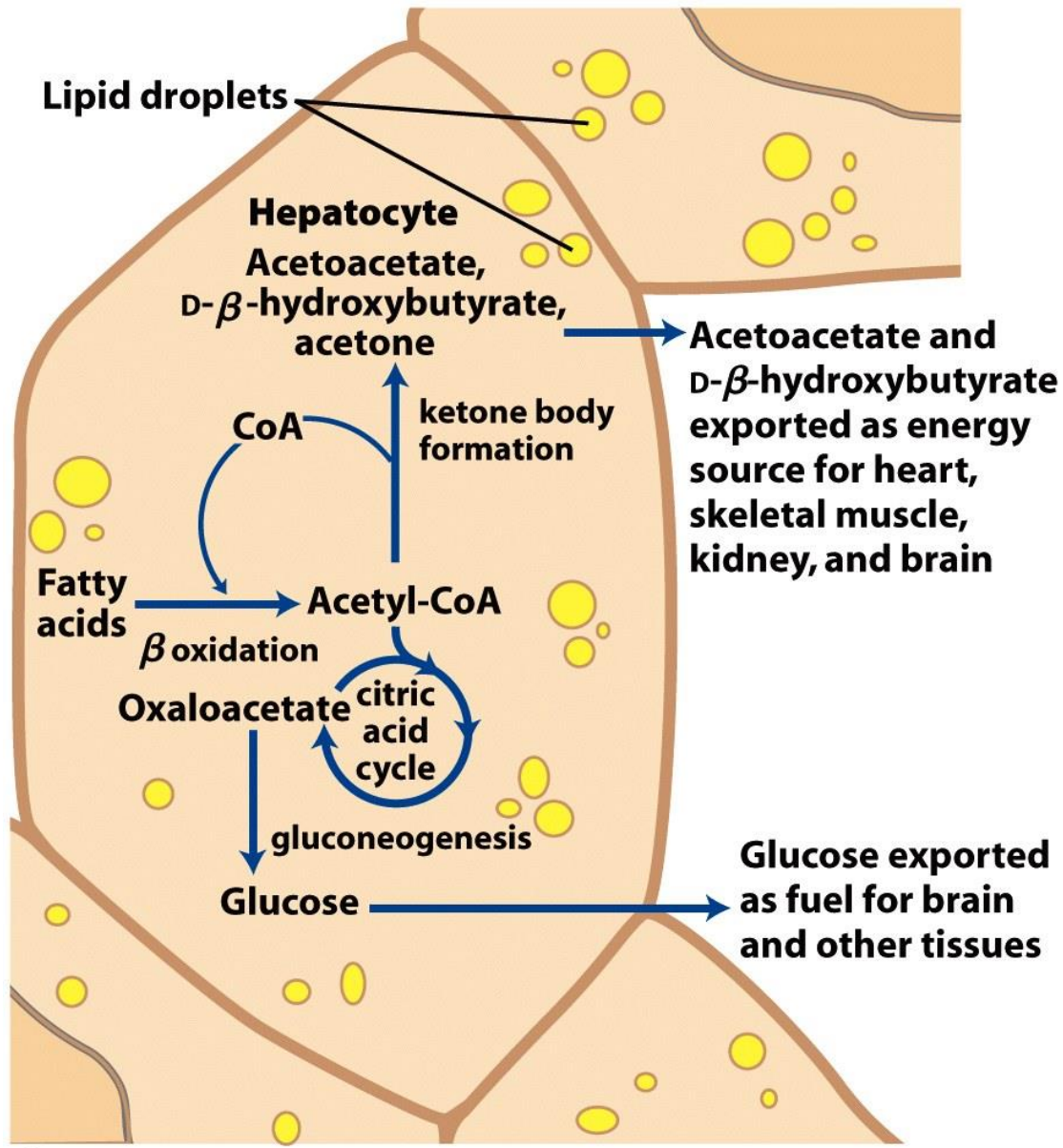


Figure 17-20
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