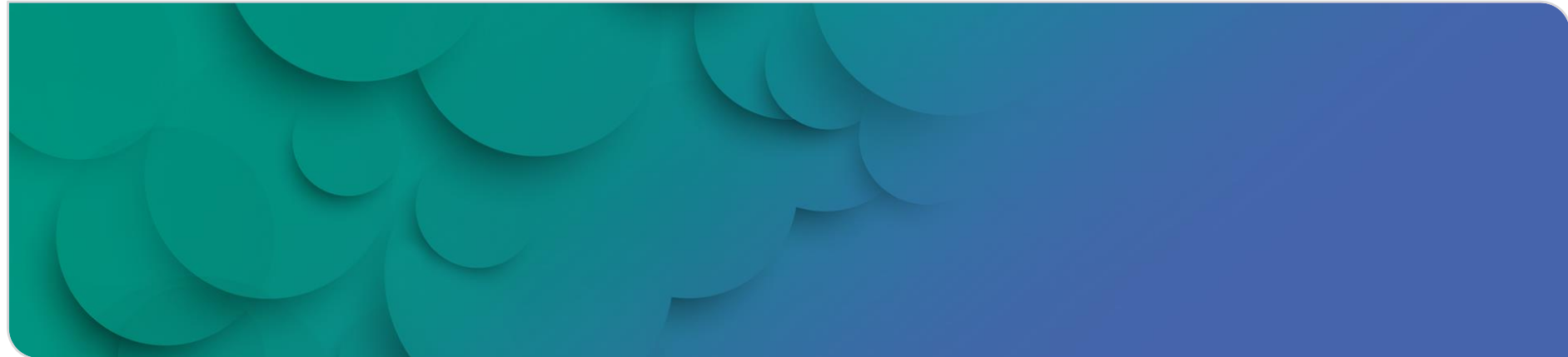


Organische Chemie I – Teil 20

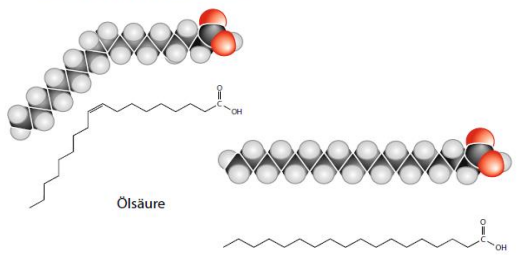
Stefan Bräse

Institut für Organische Chemie & Institut für Biologische und Chemische Systeme



Übersicht

Gesättigte und ungesättigte Fette

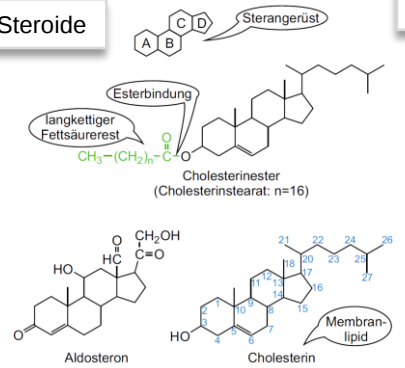


Fette/Fettsäuren

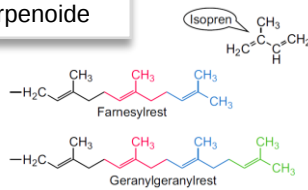
Stearinsäure

Steroide

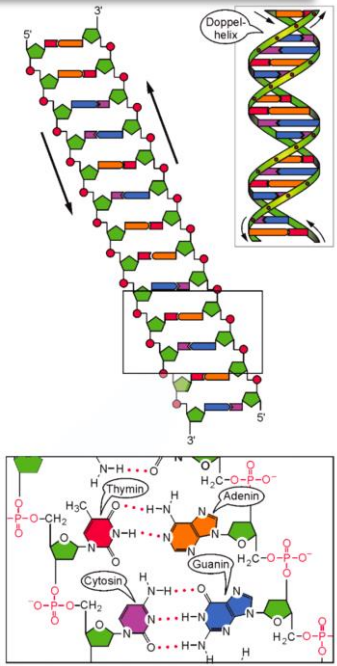
Lipide



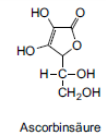
Isoprenoide/
Terpenoide



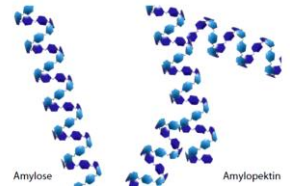
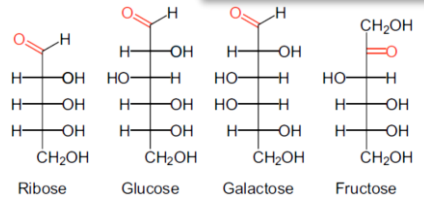
Nucleoside/Nucleotide



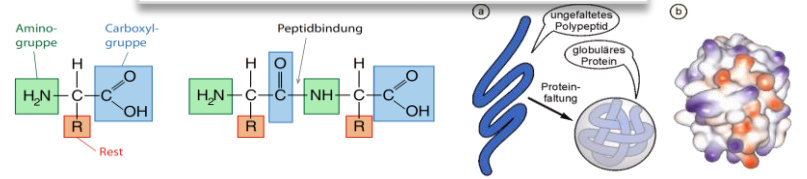
Vitamine



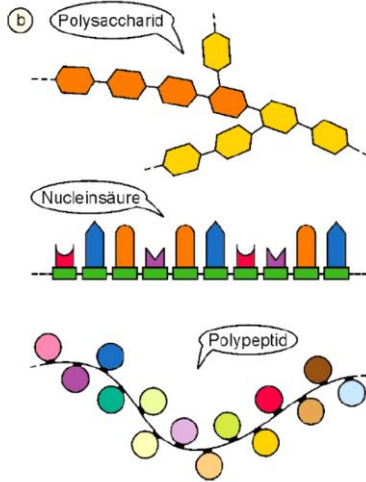
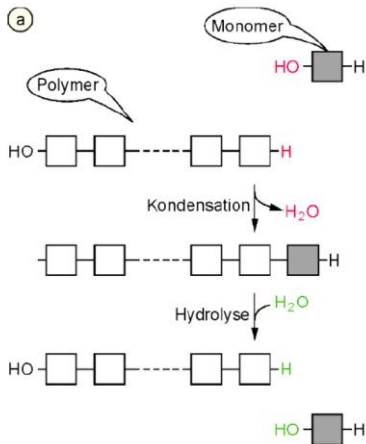
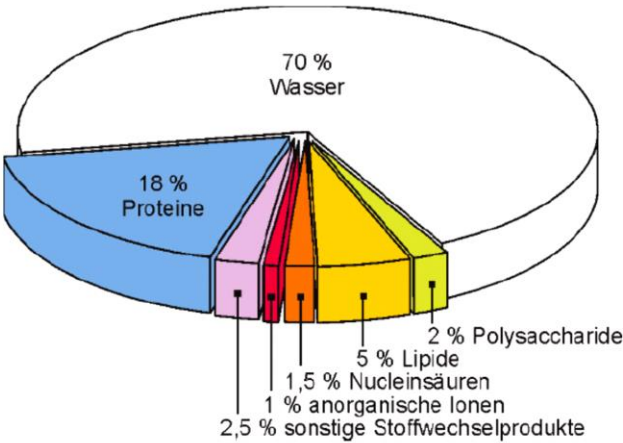
Zucker und Kohlenhydrate



Aminosäuren und Peptide/Proteine



Übersicht



Lipide

■ Stoffklassen

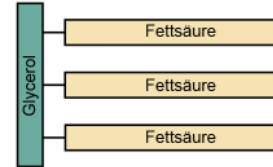
■ Fettsäuren

- Triglyceride (Fette und fette Öle)
- Wachse
- Phospholipide
- Sphingolipide

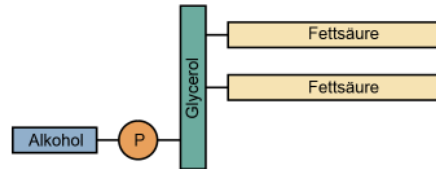
■ Isoprenoide

- Steroide
- Carotinoide

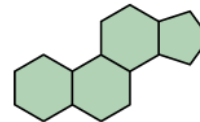
Triglyceride



Phospholipide



Steroide



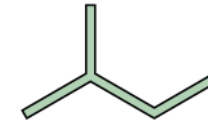
Wachse



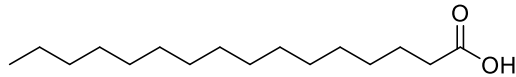
Sphingolipide (Beispiel: Ceramide)



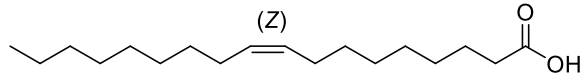
Isoprenoide



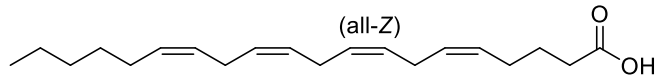
Fettsäuren und Fette



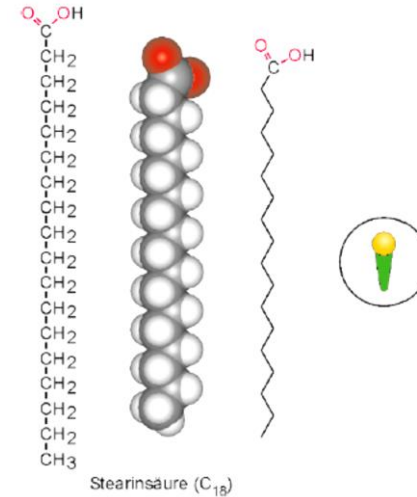
Palmitinsäure



Ölsäure



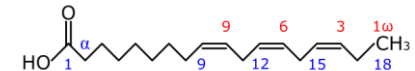
Arachidonsäure



Fettsäuren und Fette

Chemische Bezeichnung	Trivialname	Anzahl C-Atome	Doppelbindungen Anzahl	Doppelbindungen Position
Butansäure	Buttersäure	4	0	
Isopentansäure	Isovaleriansäure	5	0	
Hexansäure	Capronsäure	6	0	
Octansäure	Caprylsäure	8	0	
Decansäure	Caprinsäure	10	0	
Dodecansäure	Laurinsäure	12	0	
Tetradecansäure	Myristinsäure	14	0	
Hexadecansäure	Palmitinsäure	16	0	
Octadecansäure	Stearinsäure	18	0	
Octadecensäure	Ölsäure	18	1	cis- Δ^9
● Octadecadiensäure	Linolsäure	18	2	$\Delta^{9,12}$
● Octadecatriensäure	Linolensäure	18	3	$\Delta^{9,12,15}$
n-Eicosansäure	Arachinsäure	20	0	
● Eicosatetraensäure*	Arachidonsäure	20	4	$\Delta^{5,8,11,14}$
Docosansäure	Behensäure	22	0	
Tetracosansäure	Lignocerinsäure	24	0	
● Tetracosensäure	Nervonsäure	24	1	Δ^{15}

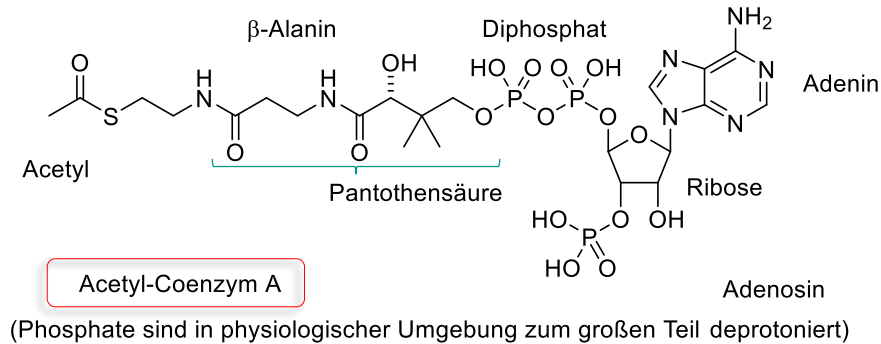
● für den Menschen essentielle Fettsäuren; Symbol $\Delta^{x,y,z}$ = Position der Doppelbindung; cis = Konfiguration der Doppelbindung



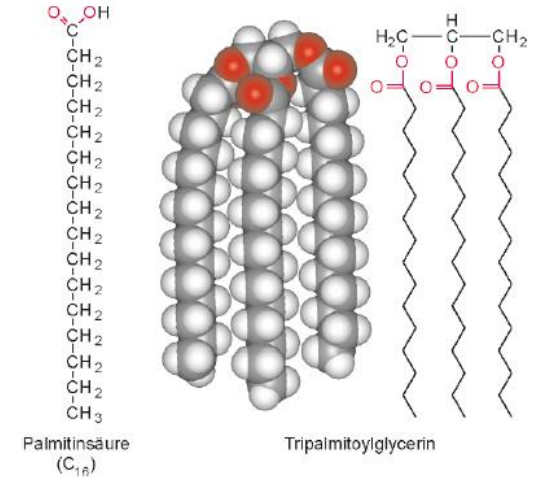
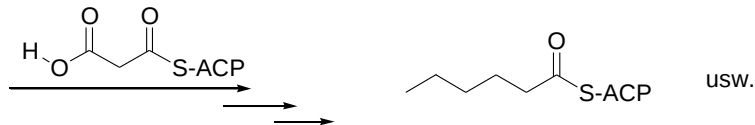
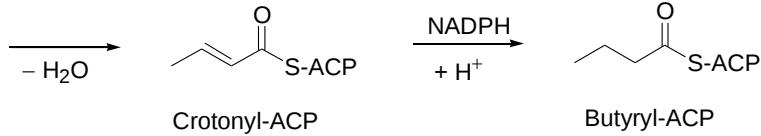
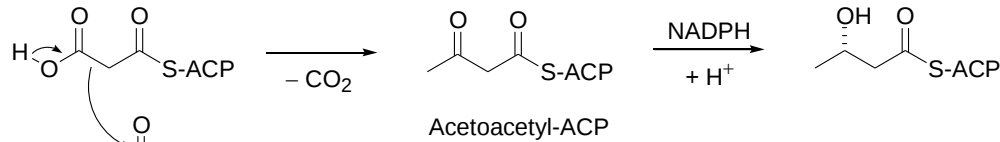
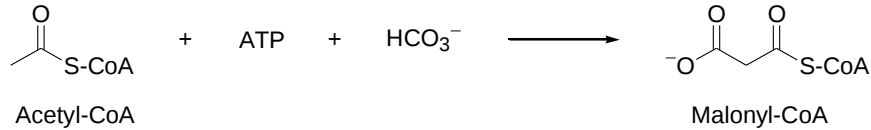
Linolensäure

Acetyl-Coenzym A

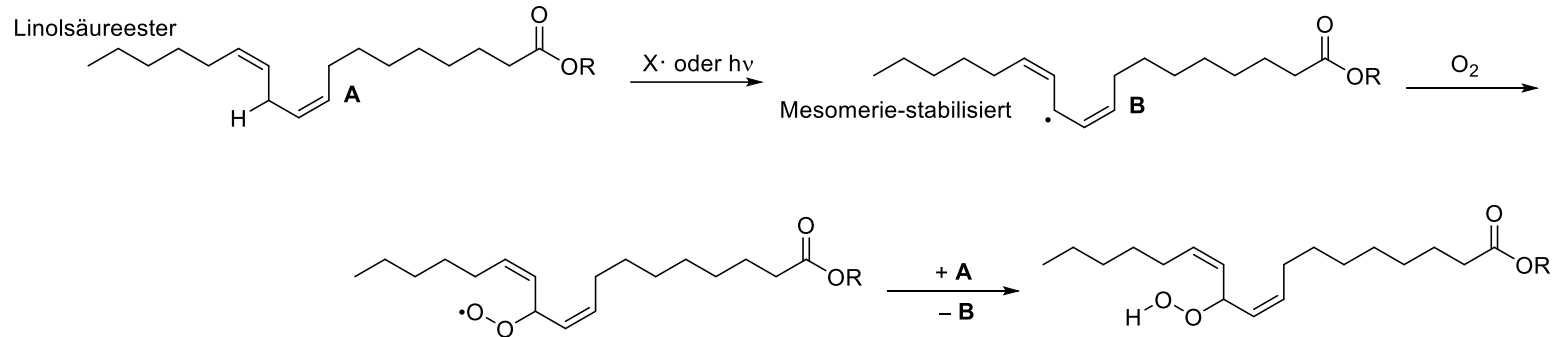
- Thiocarbonsäureester
- Wichtigstes Zwischenprodukt im Zellstoffwechsel



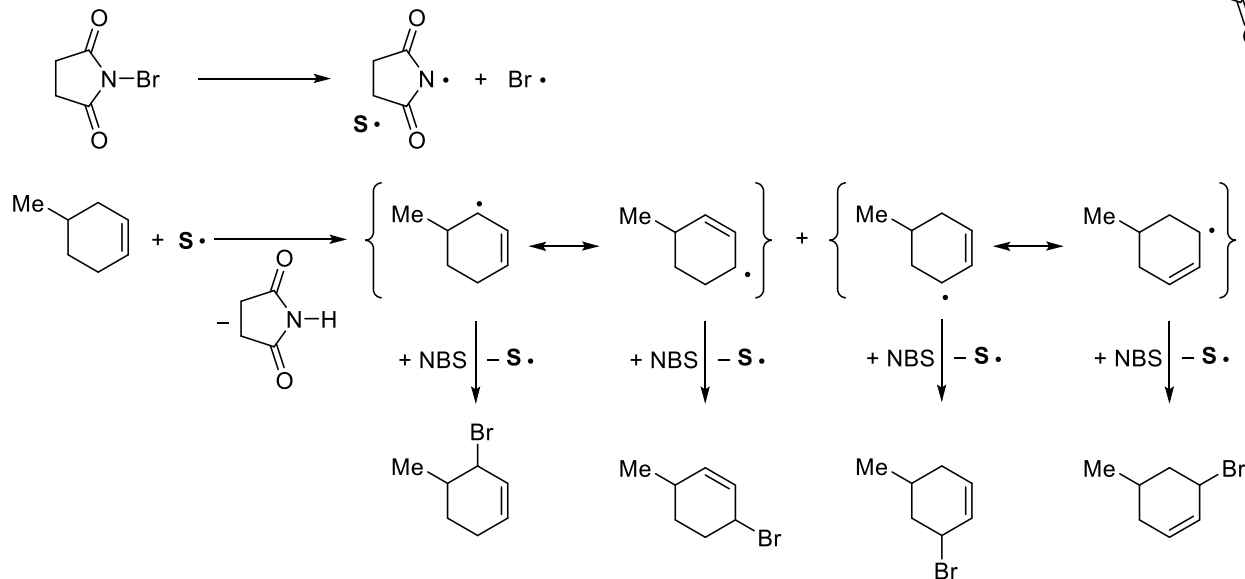
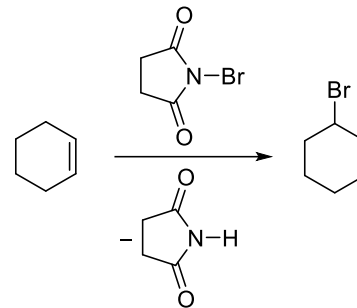
Fettsäuren und Fette



Autoxidation



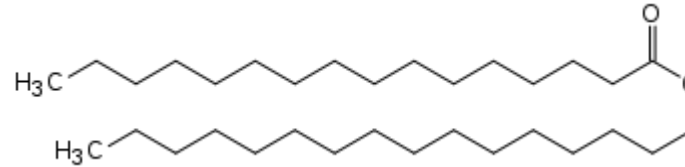
Oxidationen in allylischer Position



jeweils *cis* und *trans*

Wachse

- z.B. Cetylpalmitat, Hexadecylhexadecanoat

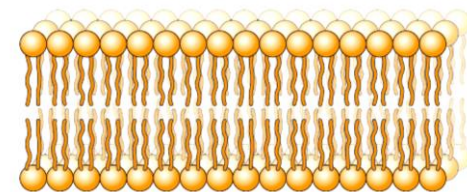
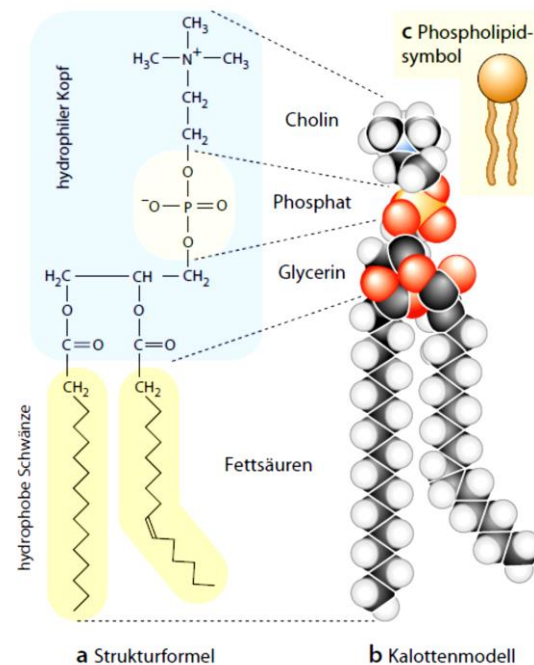
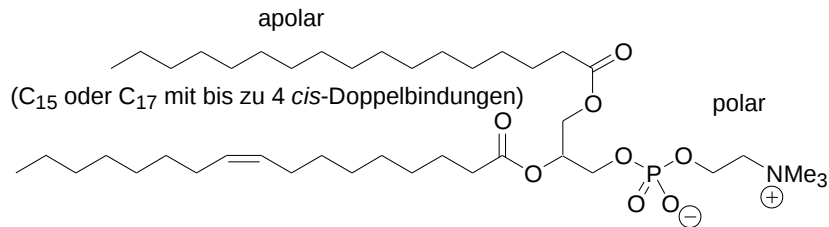


- Einfach-Ester
- lange gesättigte Alkylreste
- Härter als Fette

Phospholipide

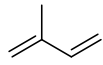
■ Lecithin, Phosphatidylcholin

- häufigstes Phospholipid der biologischen Membran



Isoprenoide – Terpene und Steroide

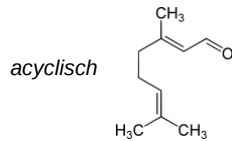
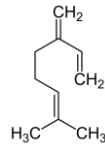
■ Grundeinheit



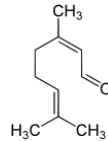
Isopren

2-Methyl-1,3-butadien

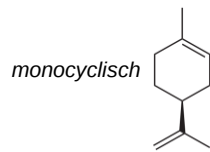
■ (Mono-)Terpene



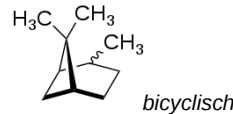
Citral A
Geranial
(E)



Citral B
Neral
(Z)

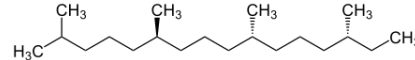


(R)-Limonen

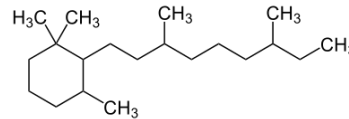


Pinan

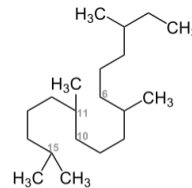
■ Diterpene



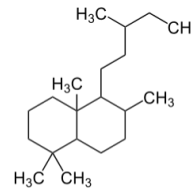
(3R,7R,11R)-Phytan



10,15-Cyclophytan

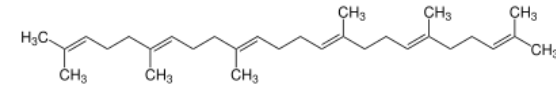


Phytan

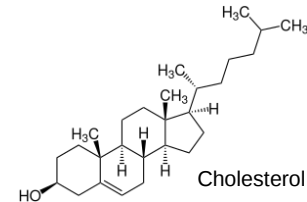


6,11,10,15-Cyclophytan
Labdan

■ Triterpene

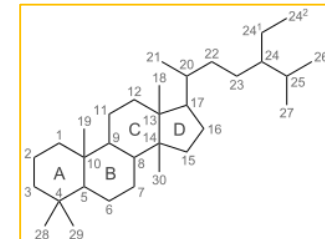


Squalen



Cholesterol

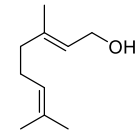
Steroide



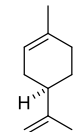
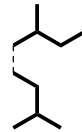
Stergrundgerüst

Isoprenoide – Terpene und Steroide

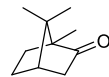
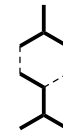
■ Beispiele



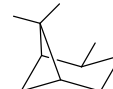
Geraniol



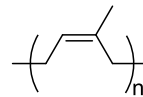
Limonen



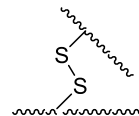
Campher



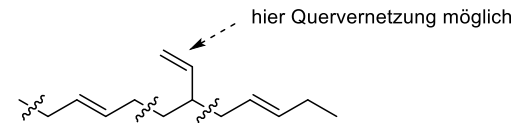
Pinan



Kautschuk



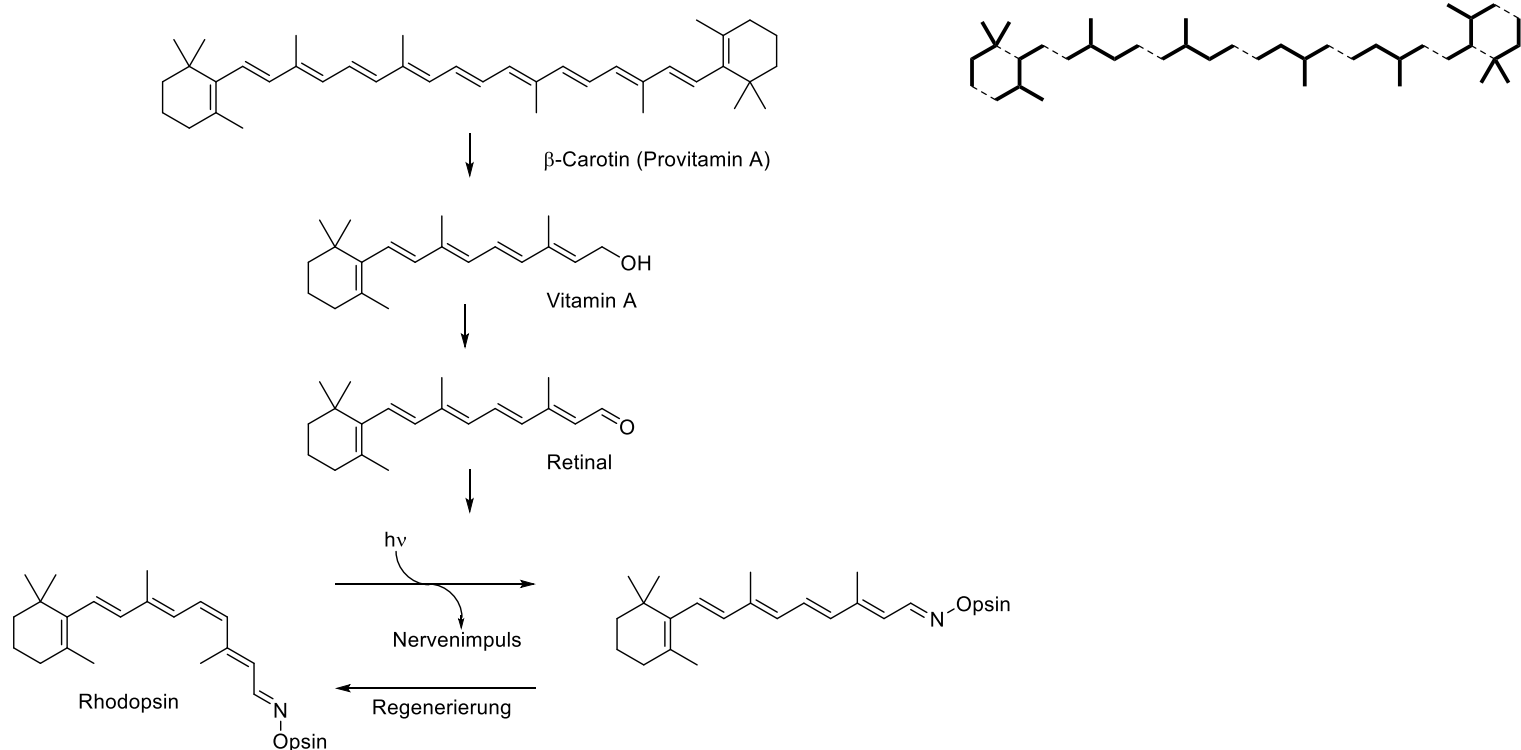
Gummi



Synthetischer Gummi

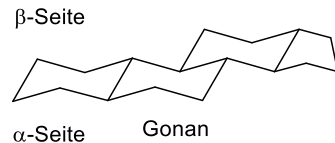
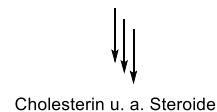
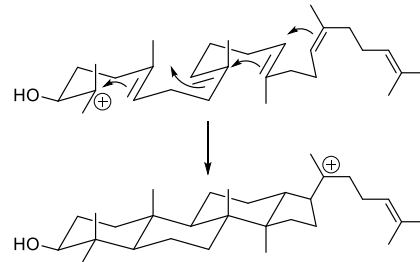
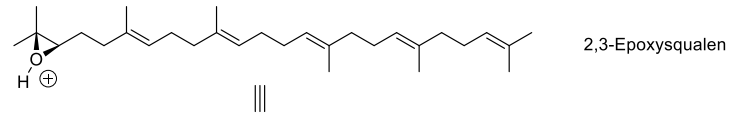
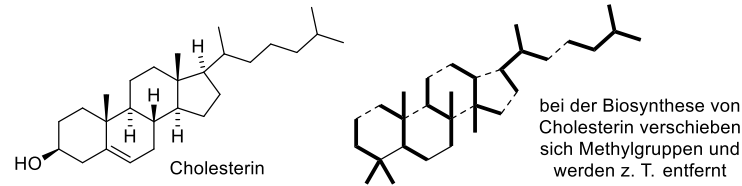
Isoprenoide – Terpene und Steroide

■ Beispiele



Isoprenoide – Terpene und Steroide

■ Beispiele



Fragen?