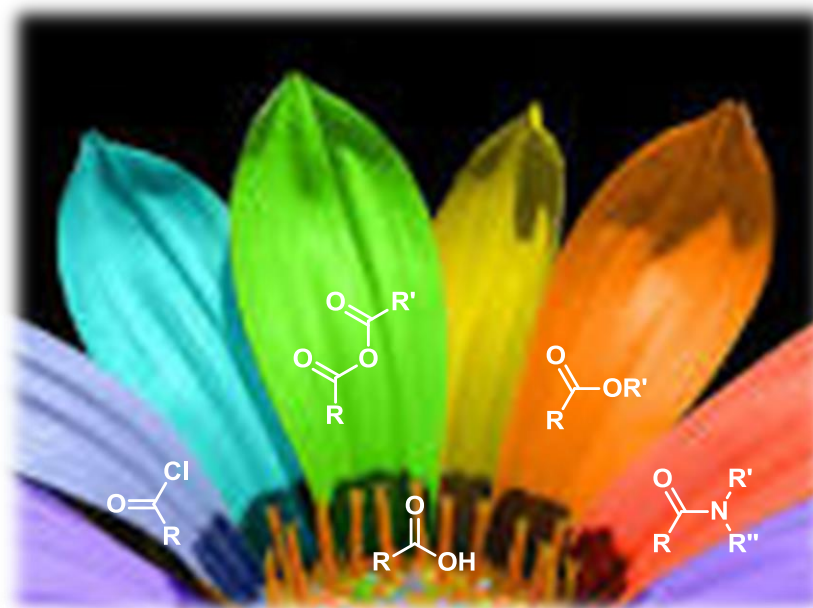
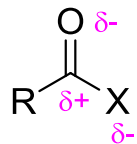


# 5. Deriváty karboxylových kyselin

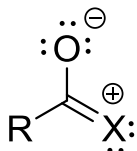
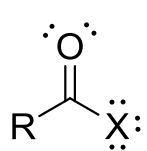




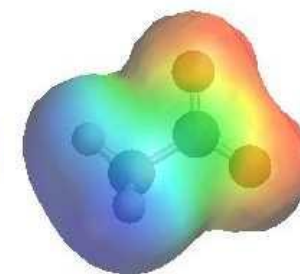
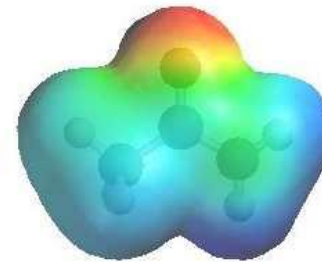
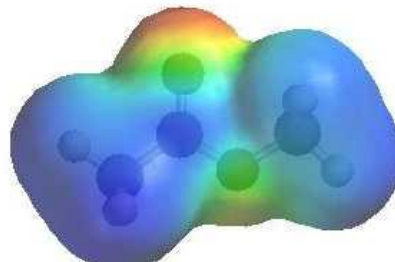
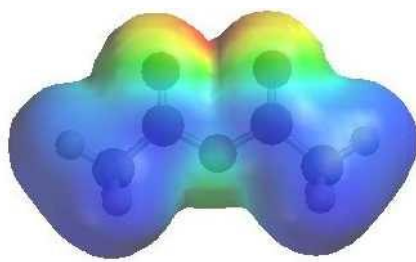
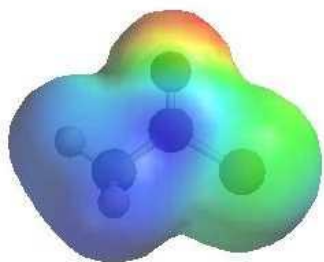
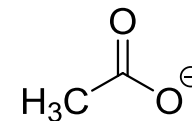
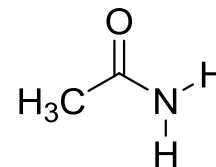
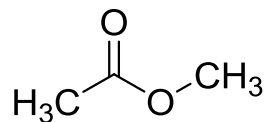
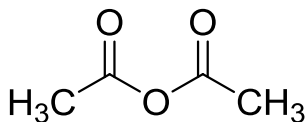
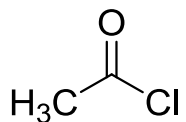
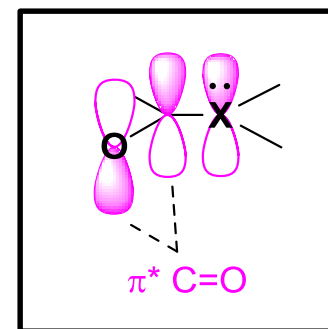
## Fundamentální reaktivita



indukční efekt



mezomerní efekt (delokalizace)

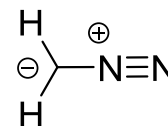
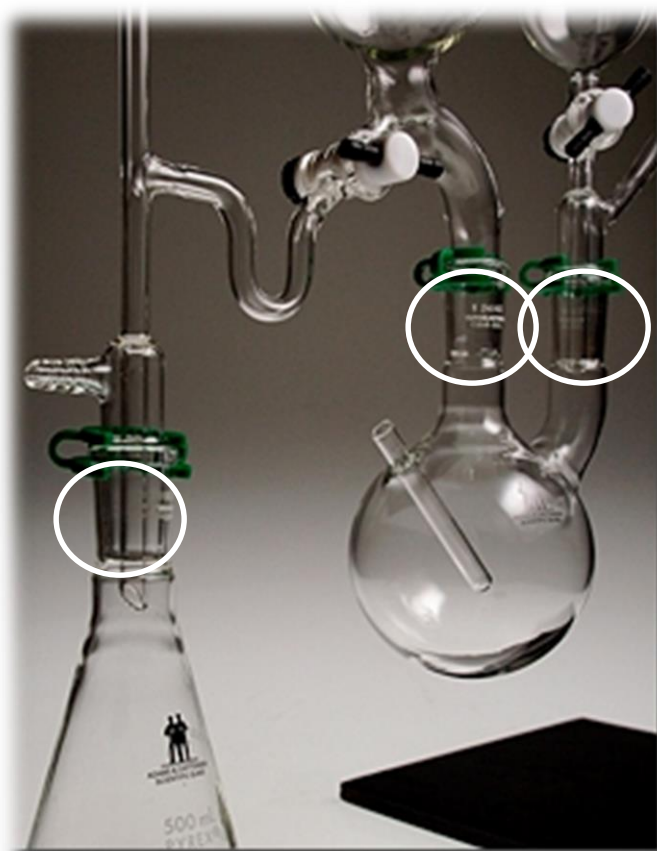


images from: <http://www.chem.ucalgary.ca/courses/350/Carey5th/Ch20/ch20-1-3.html>





- Diazomethan je explozivní a toxický (b.v.  $-23\text{ }^{\circ}\text{C}$ )

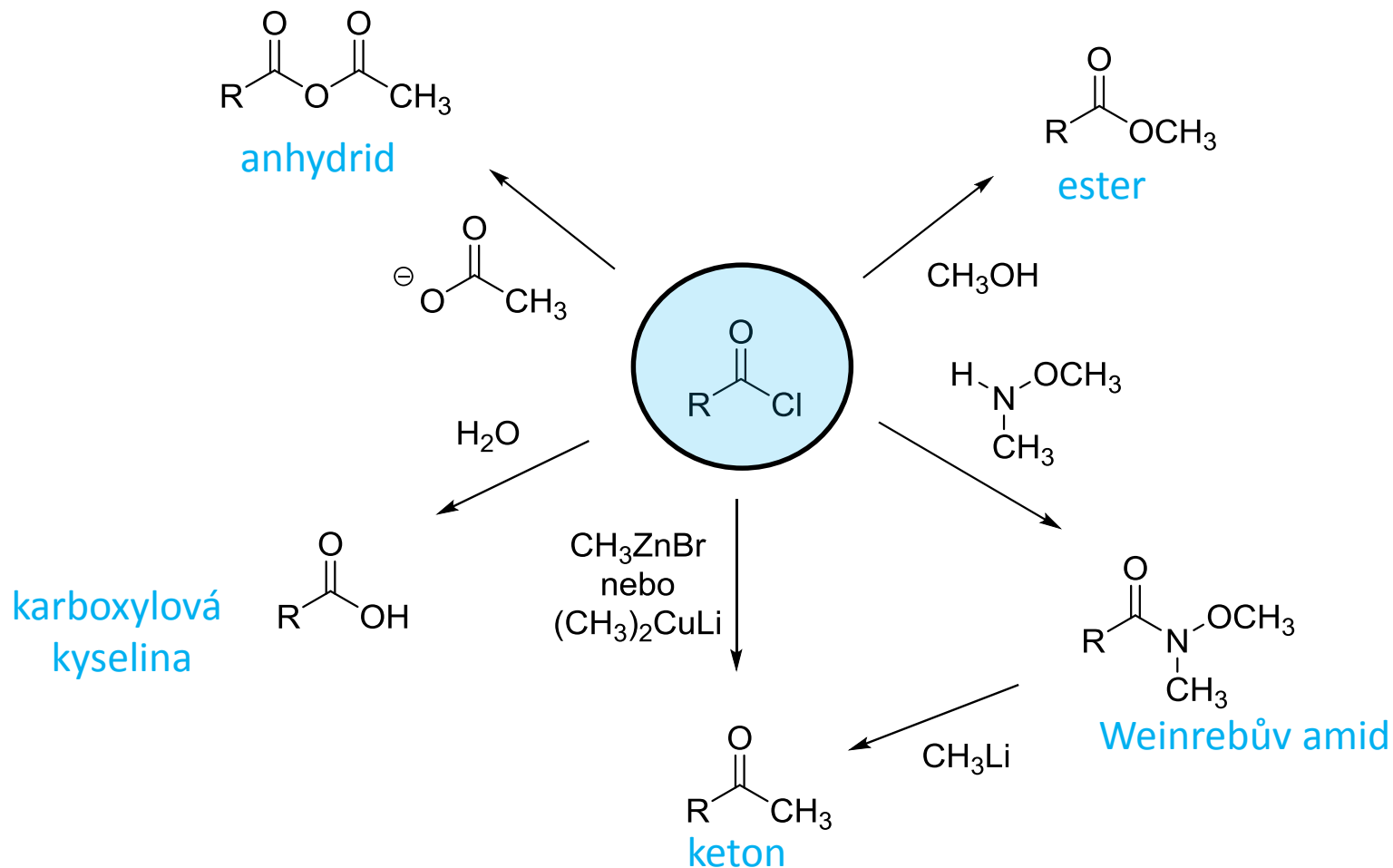


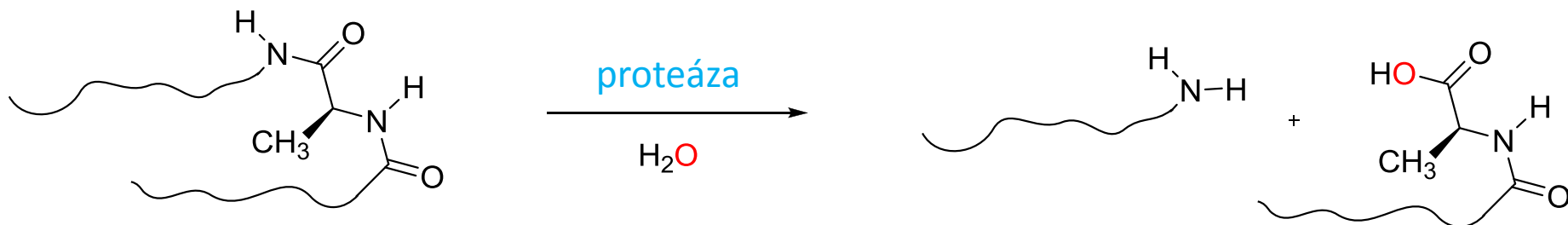
roztok diazomethanu  
v diethyl etheru

Destilační aparatura na přípravu diazomethanu (bez zábrusů)



- Chloridy jsou velmi důležité intermediáty v organické syntéze





## Proteasom

- multiproteinový komplex s proteolytickými vlastnostmi
- selektivní degradace nepotřebných (poškozených) proteinů
- vzniklé peptidy jsou využity k syntéze nových proteinů

## Struktura a funkce proteasomu

**Nobelova cena za chemii 2004 & 2009**

Aaron Ciechanover

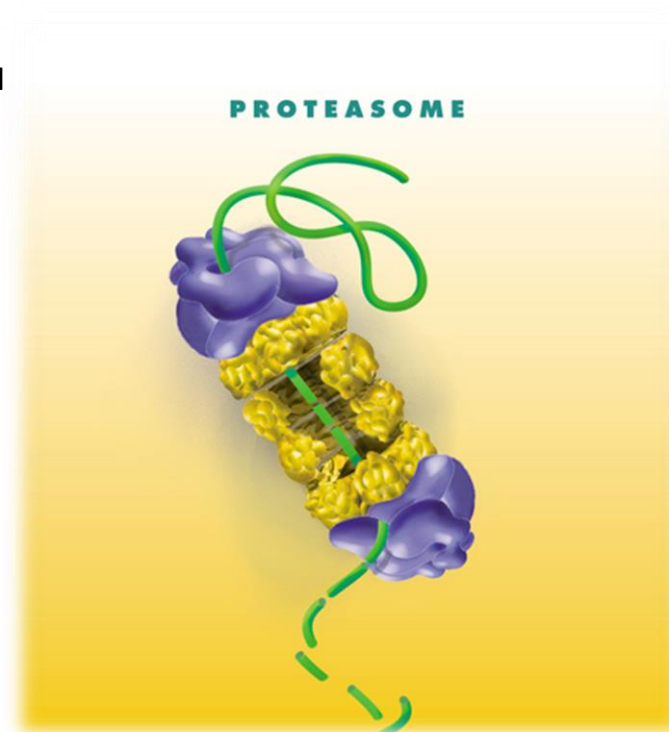
Avram Hershko

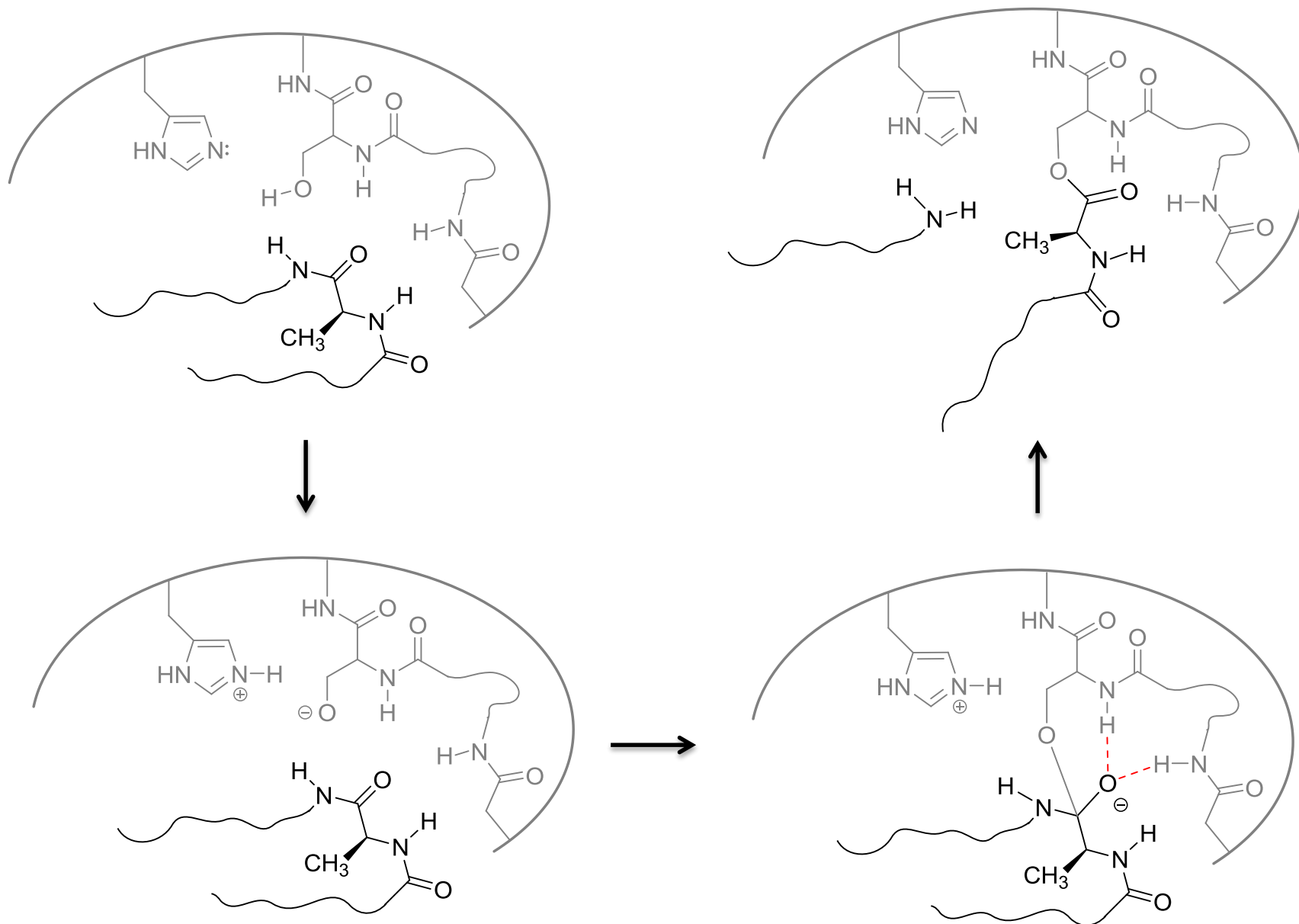
Irwin Rose

Venkatraman Ramakrishnan

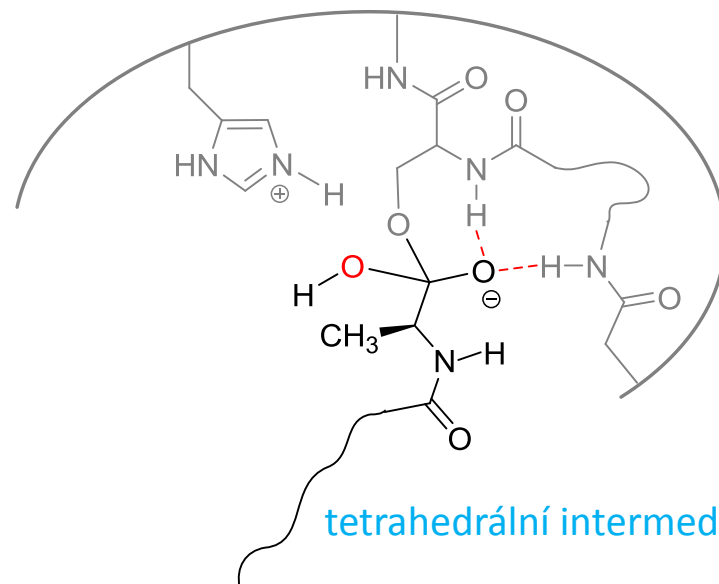
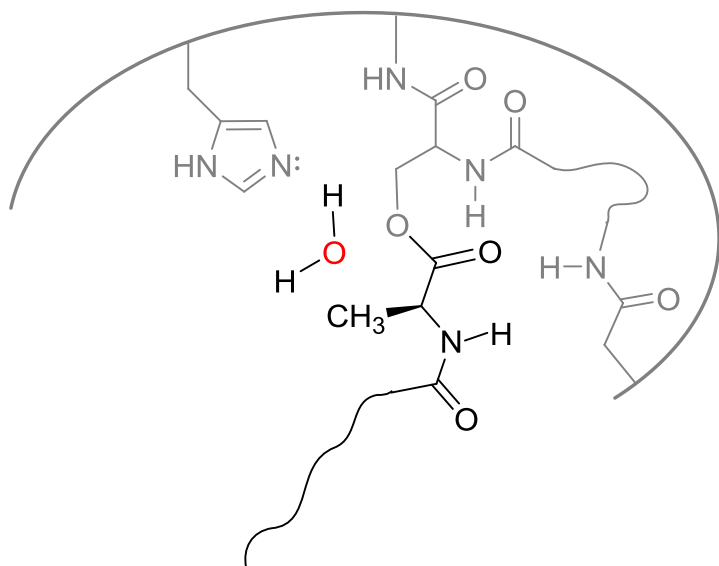
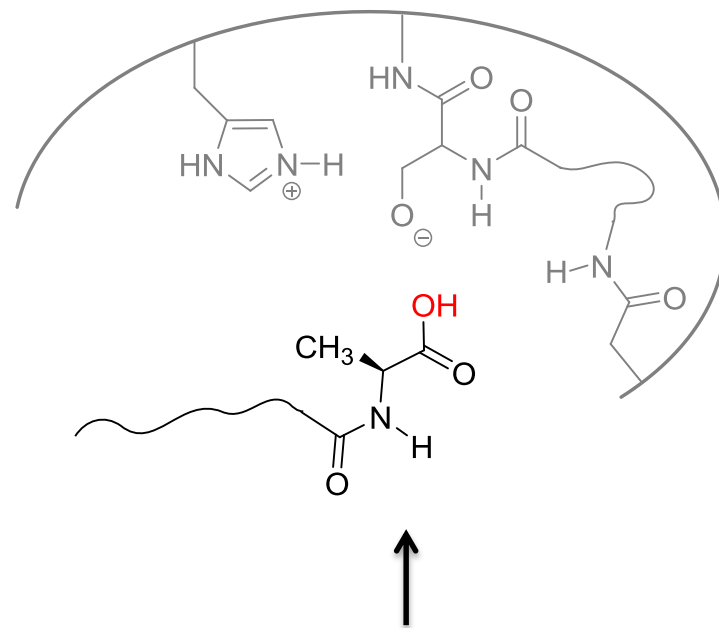
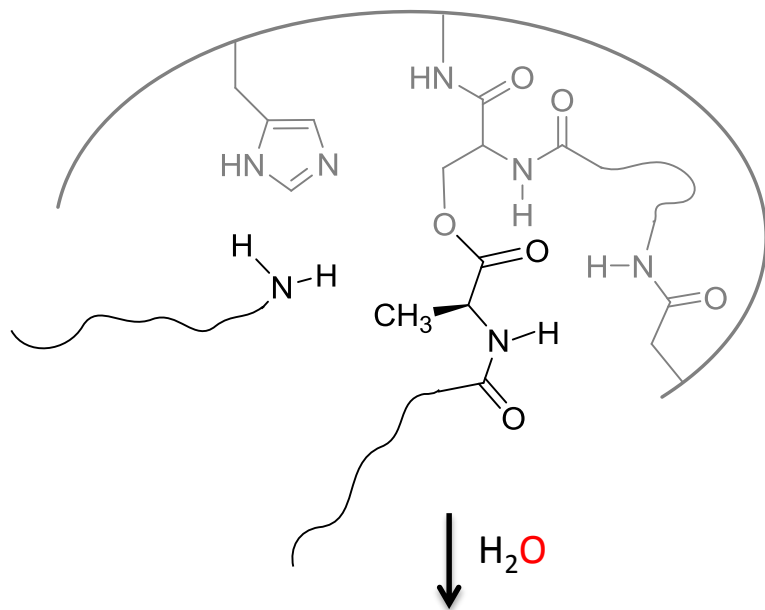
Thomas A. Steitz

Ada E. Yonath



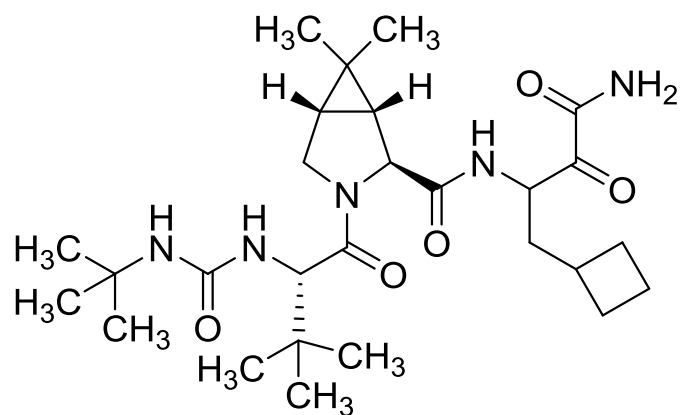


tetrahedrání intermediát



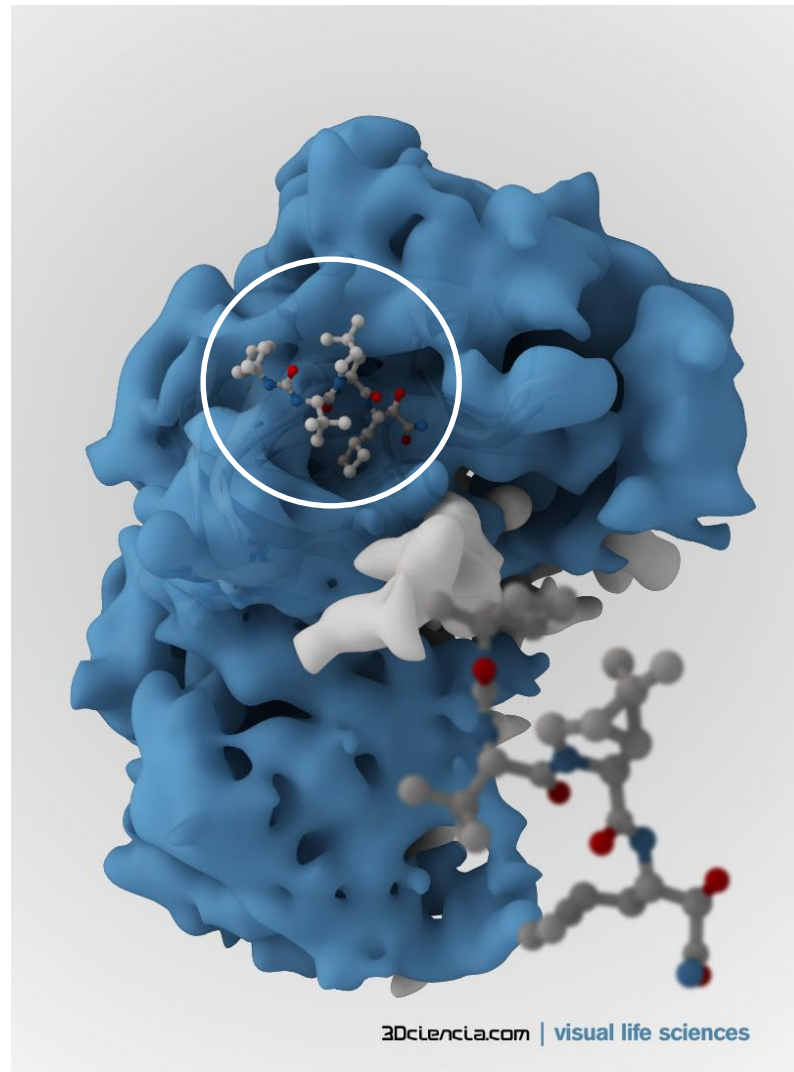


- proteáza NS3 viru hepatitidy C je důležitá pro replikaci viru

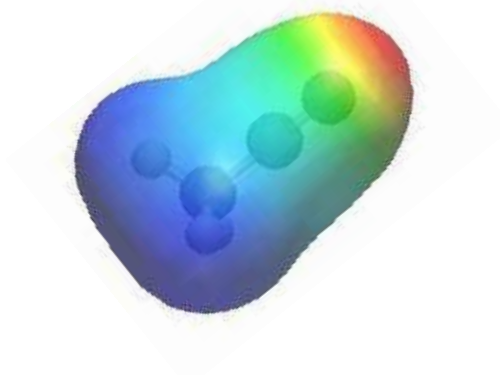
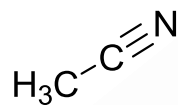
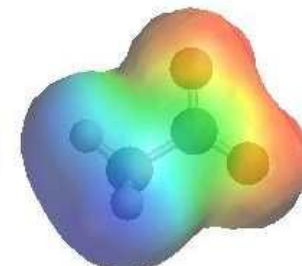
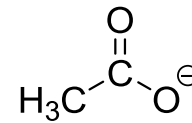
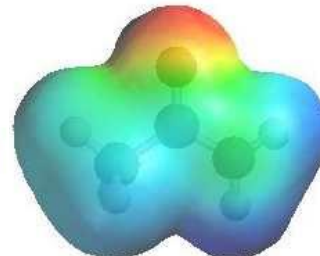
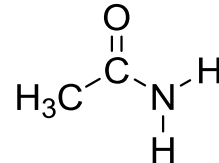
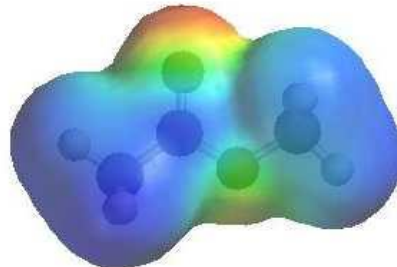
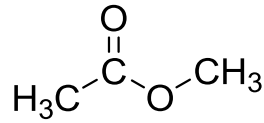
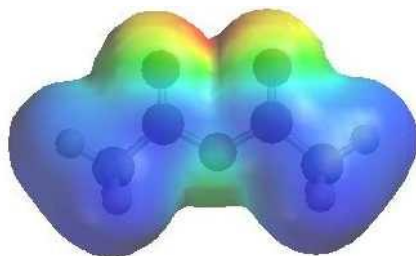
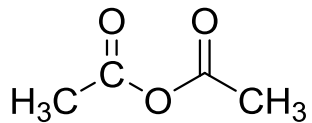
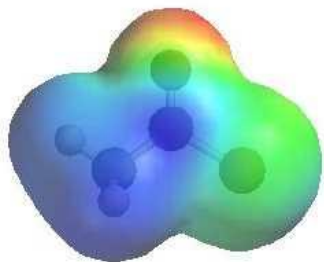
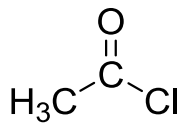


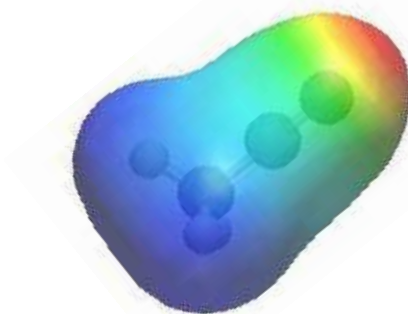
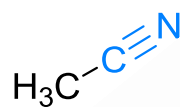
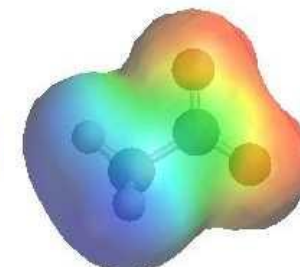
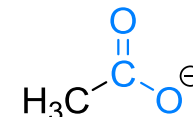
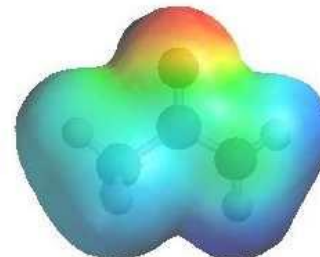
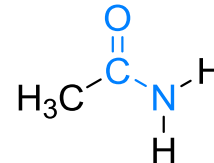
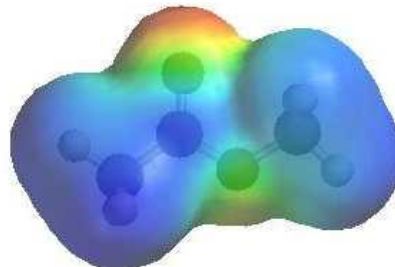
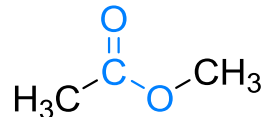
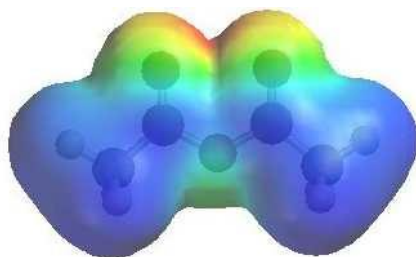
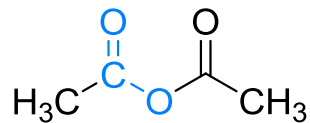
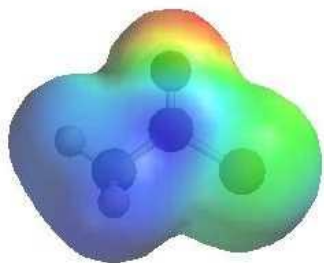
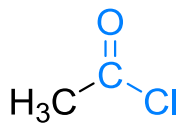
### boceprevir

inhibitor proteázy NS3 virusu hepatitidy C  
váže se do aktivního místa NS3



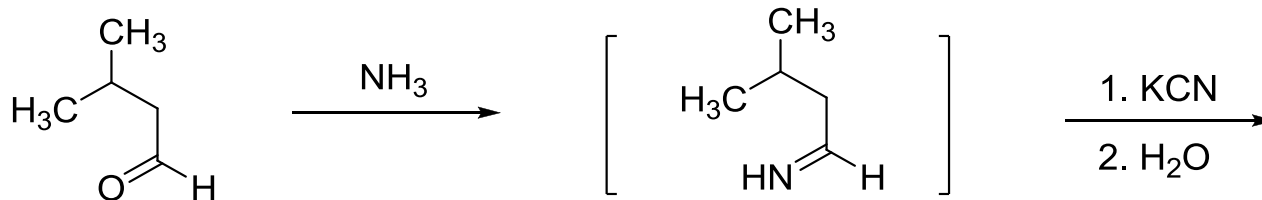




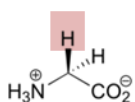
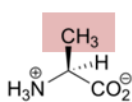
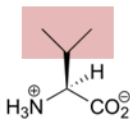
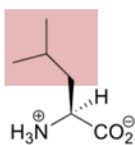
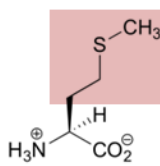
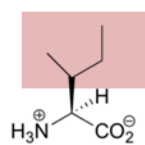


*nitril je v oxidačním stupni  
karboxylové kyseliny*

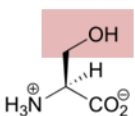
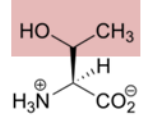
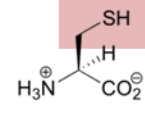
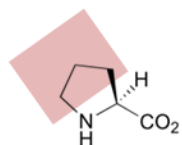
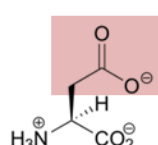
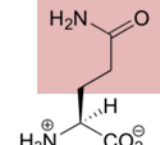




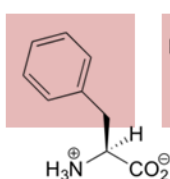
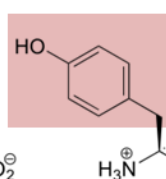
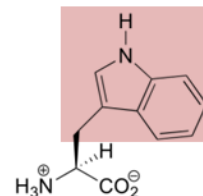
## Nonpolar, aliphatic side groups

Glycine  
Gly, GAlanine  
Ala, AValine  
Val, VLeucine  
Leu, LMethionine  
Met, MIsoleucine  
Ile, I

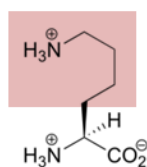
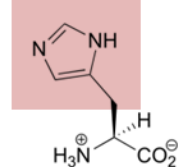
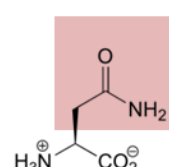
## Polar, uncharged side groups

Serine  
Ser, SThreonine  
Thr, TCysteine  
Cys, CProline  
Pro, PAspartate  
Asp, DGlutamine  
Gln, Q

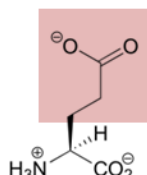
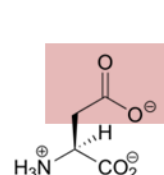
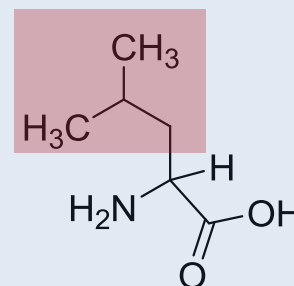
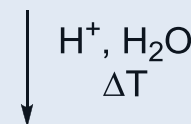
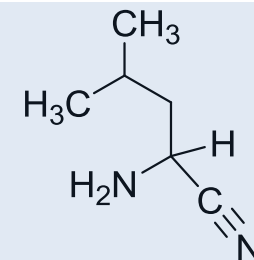
## Aromatic side groups

Phenylalanine  
Phe, FTyrosine  
Tyr, YTryptophan  
Trp, W

## Positively charged side groups

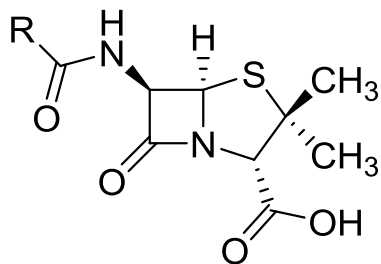
Lysine  
Lys, KHistidine  
His, HAsparagine  
Asn, N

## Negatively charged side groups

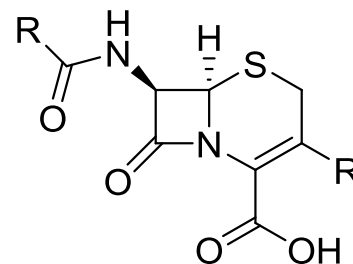
Glutamate  
Glu, EAspartate  
Asp, D

Leucin

*hydrolýza nitrilu na  
karboxylovou kyselinu*



Penicilin



Cephalosporin

*Inhibice bakteriální transpeptidázy – klíčový enzym pro tvorbu buněčné stěny*

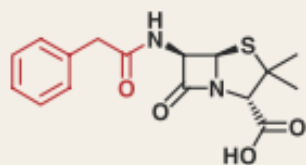
**Resistance** bakterií vůči běžně používaným antibiotikům (např. beta-laktamáza) inspiruje přípravu nových strukturních analogů (organická syntéza).

Generation 1

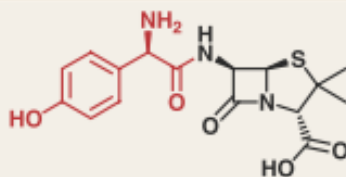
Generation 2

Generation 3

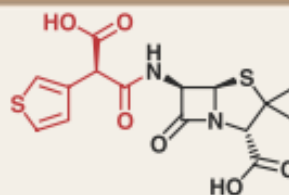
Generation 4



Penicillin G



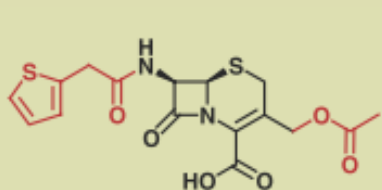
Amoxicillin



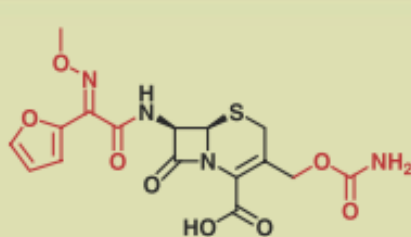
Ticarcillin



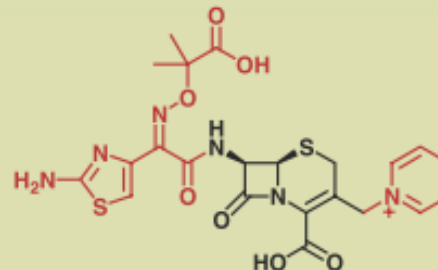
Piperacillin



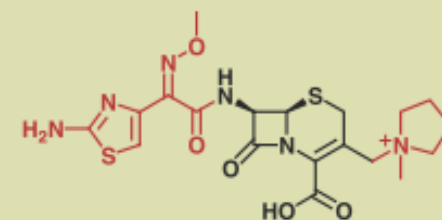
Cefalotin



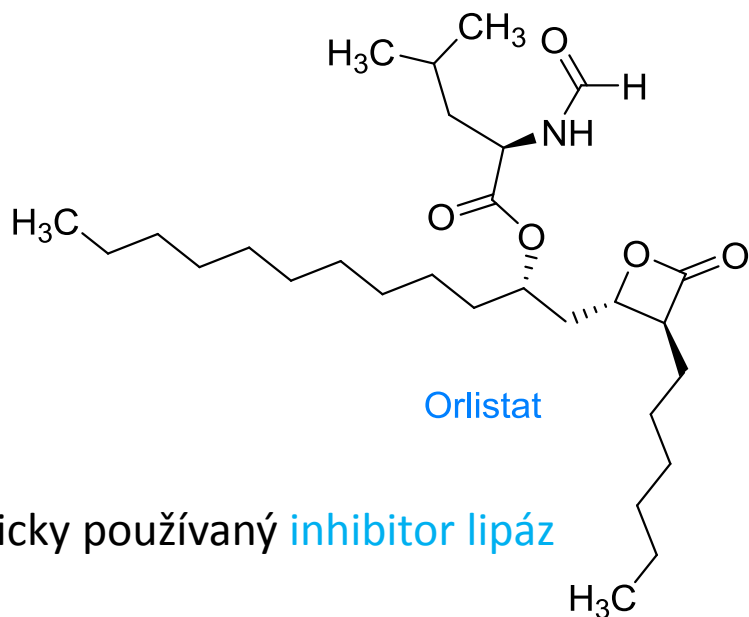
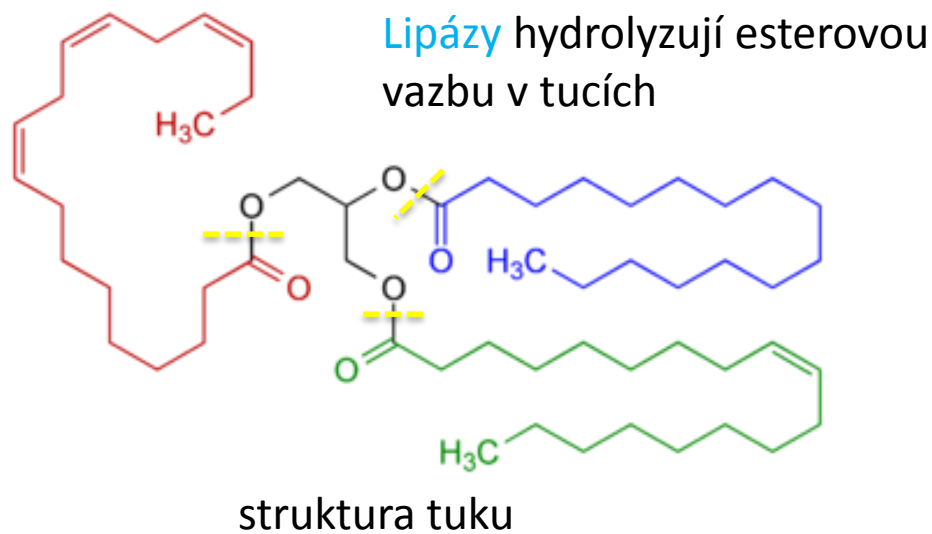
Cefuroxime



Ceftazidime

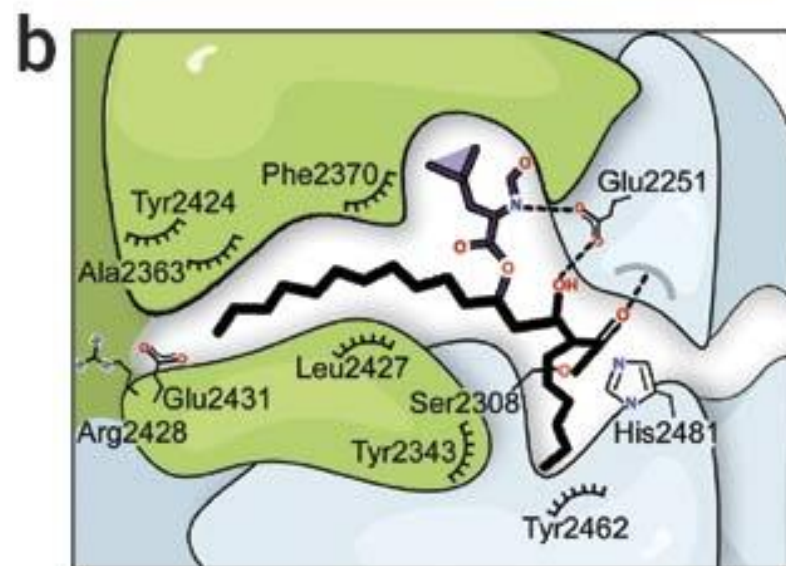
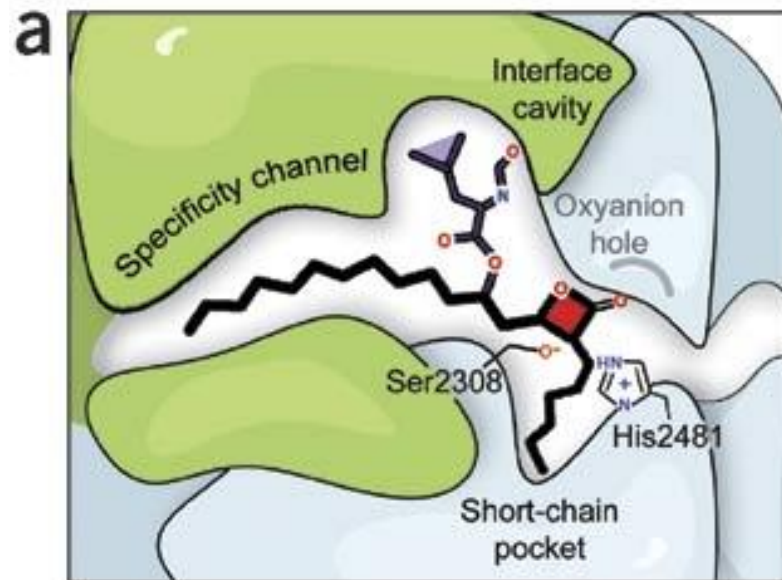


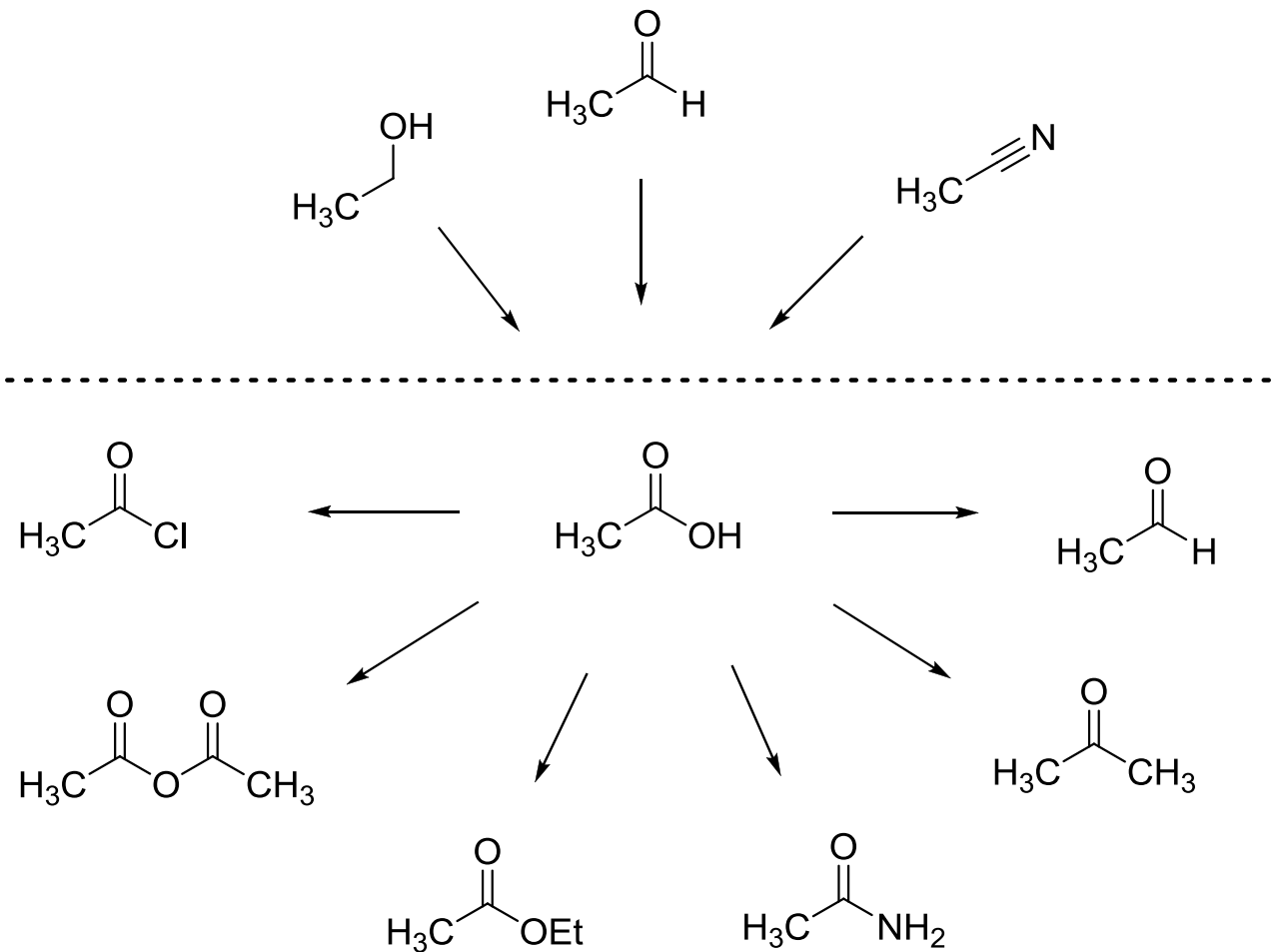
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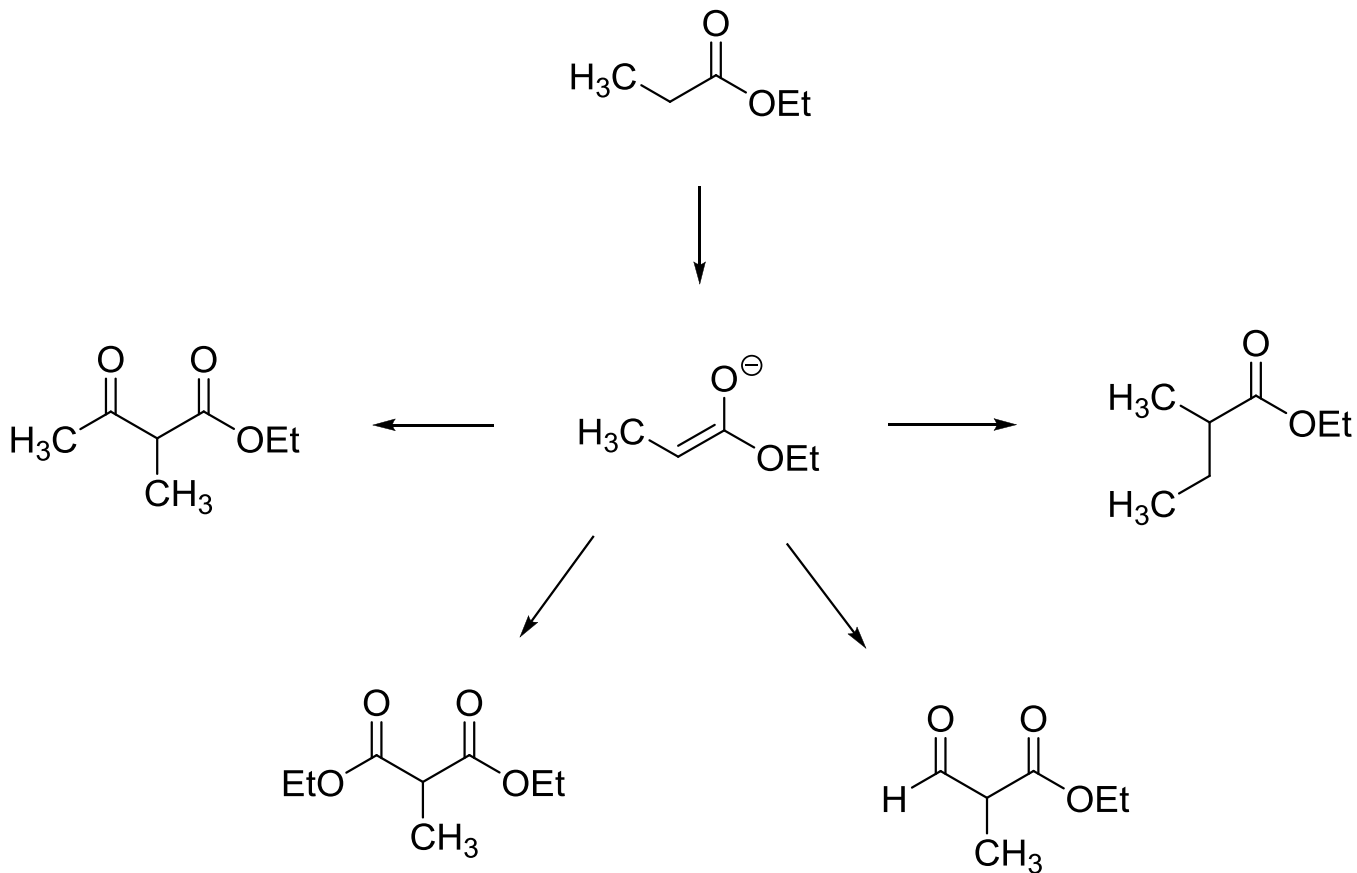


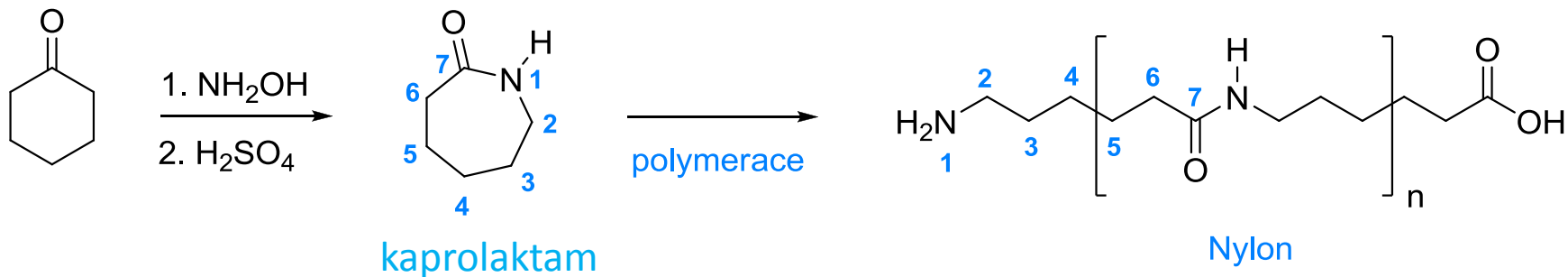
- klinicky používaný **inhibitor lipáz**

## komplex lipázy a orlistatu

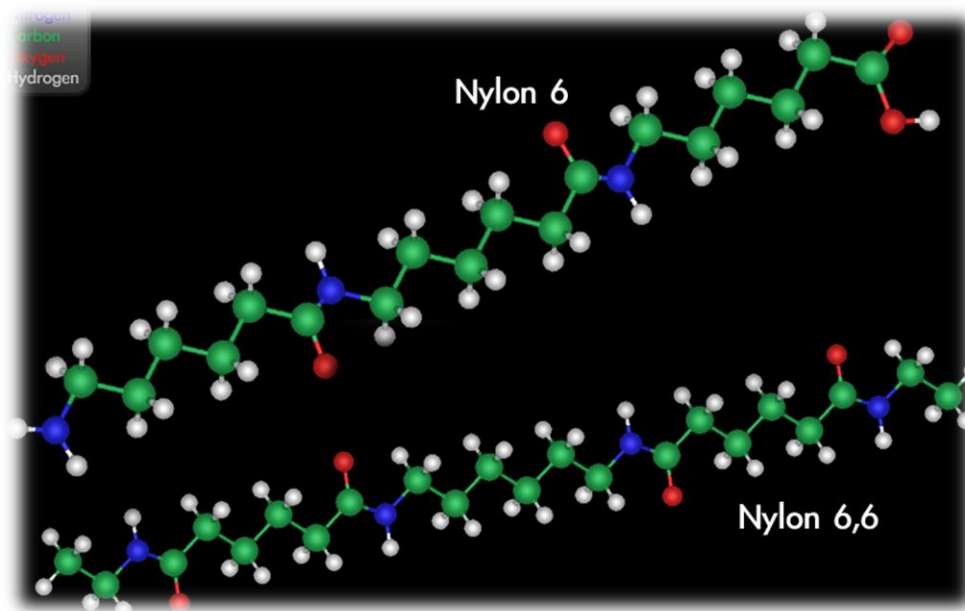








4.5 mil. tun / rok ... Beckmannovým přesmykem



[http://en.wikipedia.org/wiki/Nylon\\_6](http://en.wikipedia.org/wiki/Nylon_6)



<http://fiberpolymer.invista.com/en/about.html>