



## Prostaglandins

(Let's perturb pathways and see what happens!)

# Production

“Particle Physics”

Consistency of dose

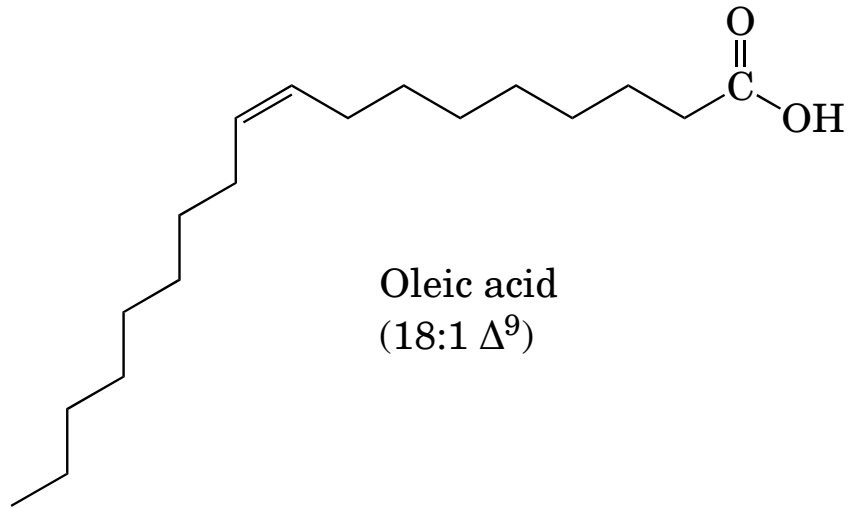
Stability

Size

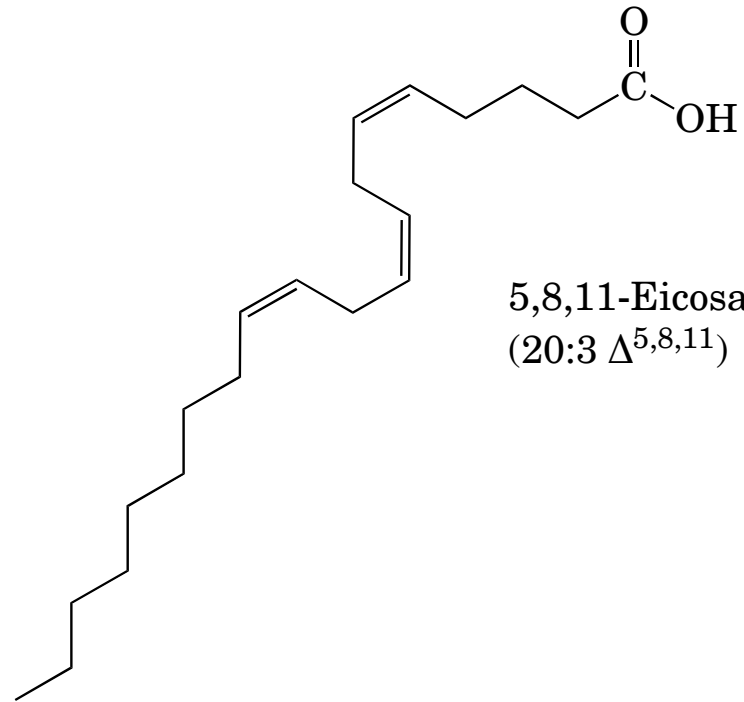
Elegance

# Fatty Acid Nomenclature

$\omega^9$  fatty acids



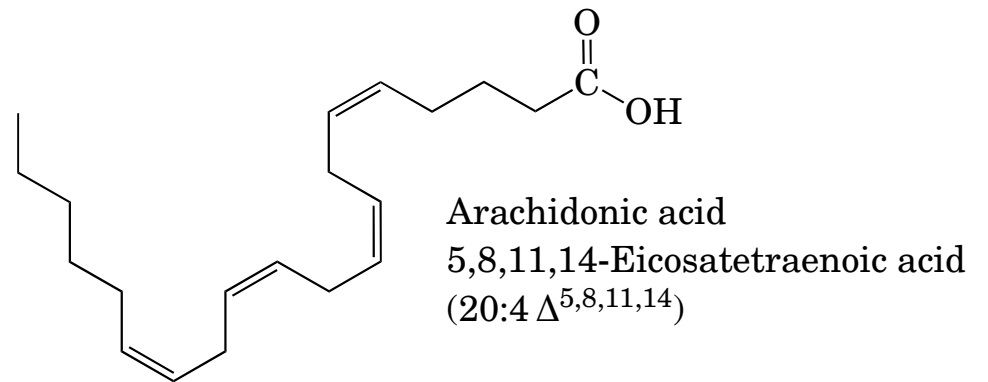
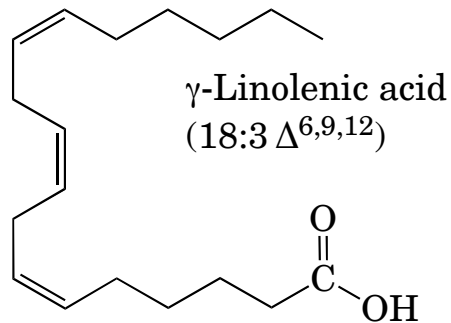
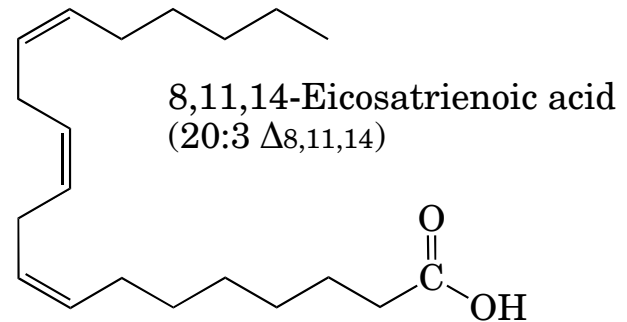
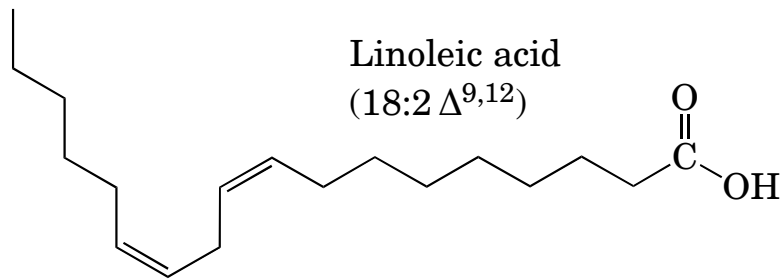
Oleic acid  
(18:1  $\Delta^9$ )



5,8,11-Eicosatrienoic acid  
(20:3  $\Delta^{5,8,11}$ )

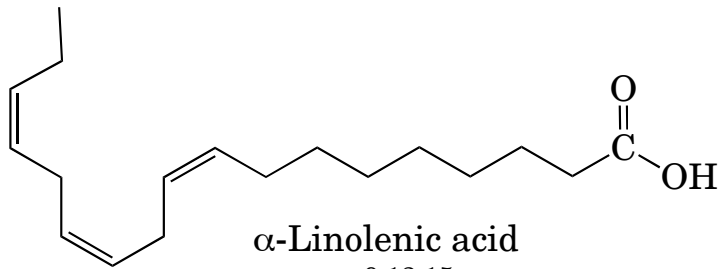
# Fatty Acid Nomenclature

$\omega^6$  fatty acids

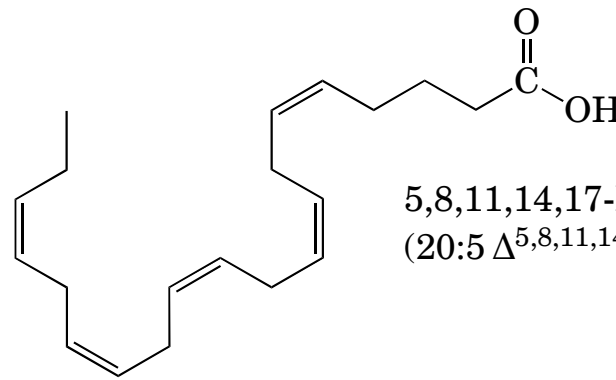


# Fatty Acid Nomenclature

$\omega^3$  fatty acids

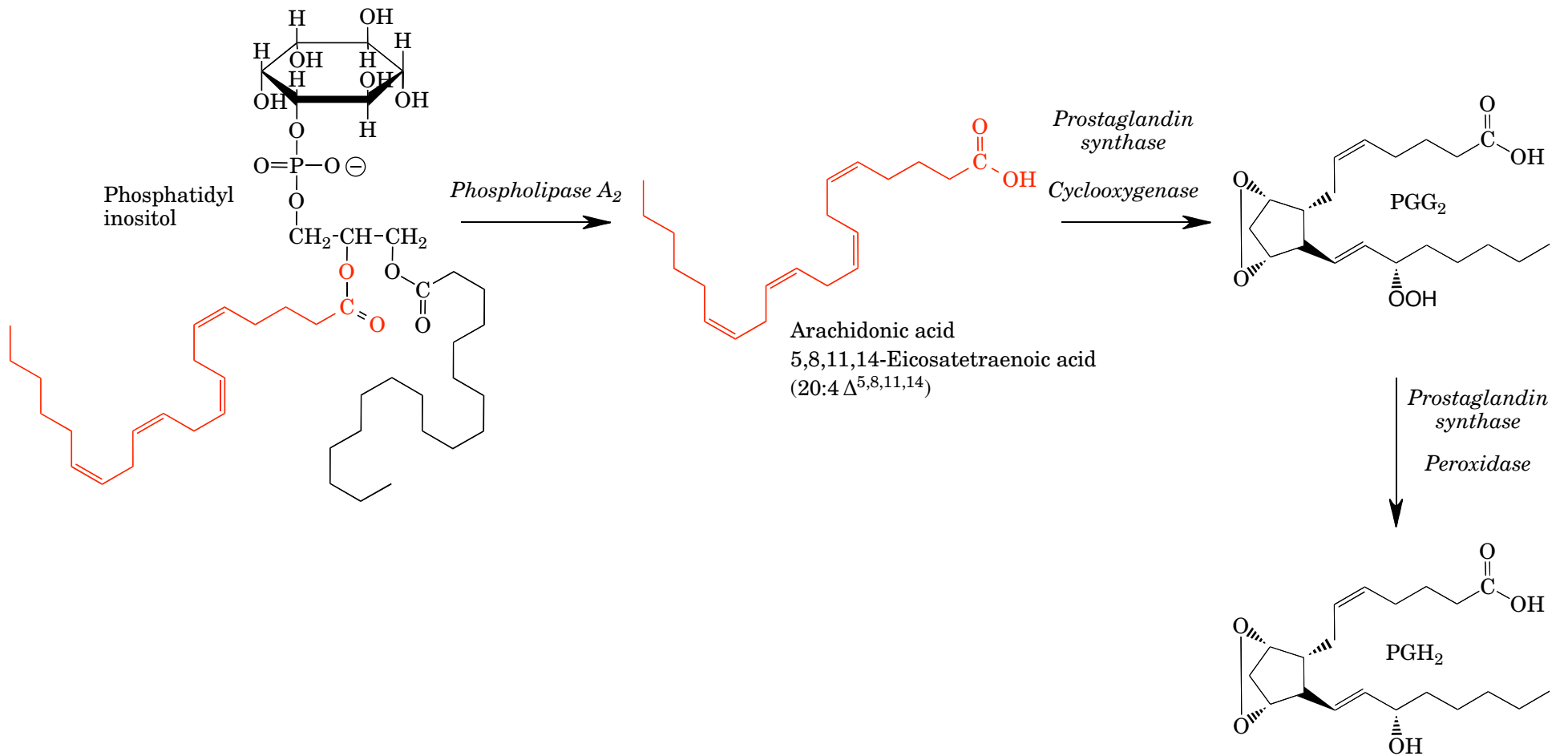


$\alpha$ -Linolenic acid  
(18:3  $\Delta^{9,12,15}$ )

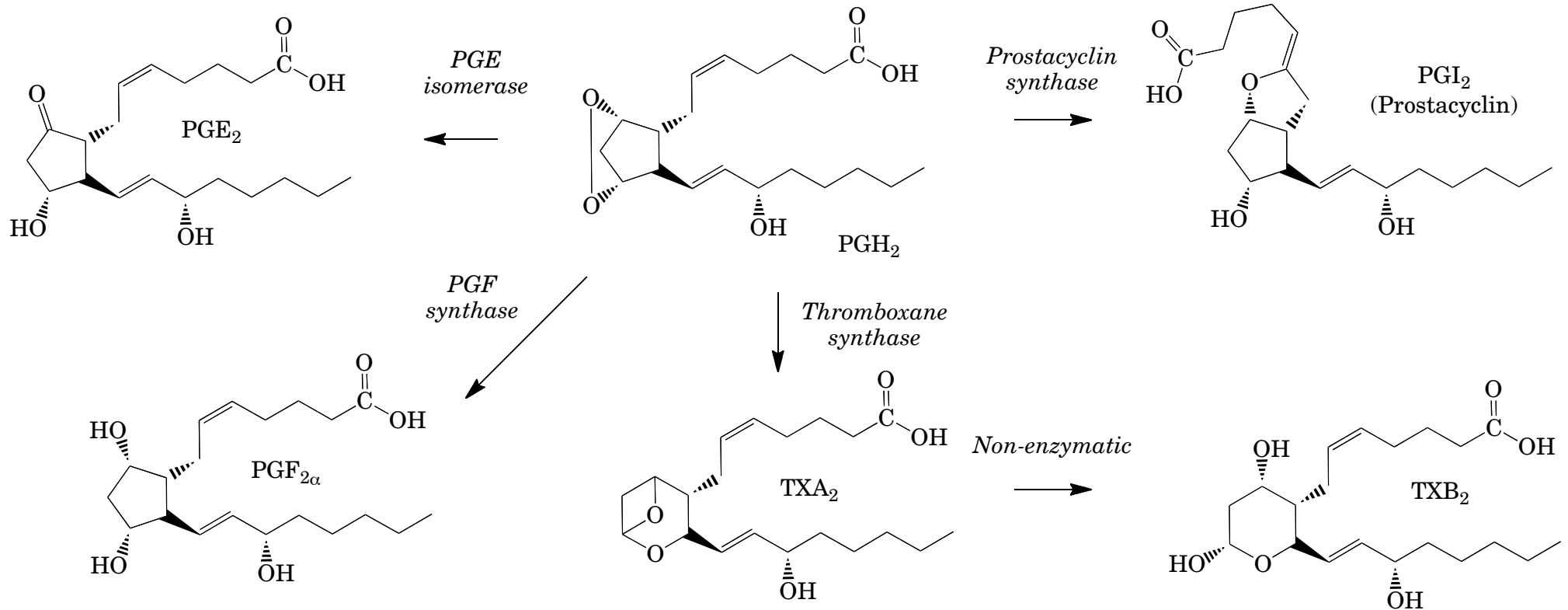


5,8,11,14,17-Eicosapentaenoic acid  
(20:5  $\Delta^{5,8,11,14,17}$ )

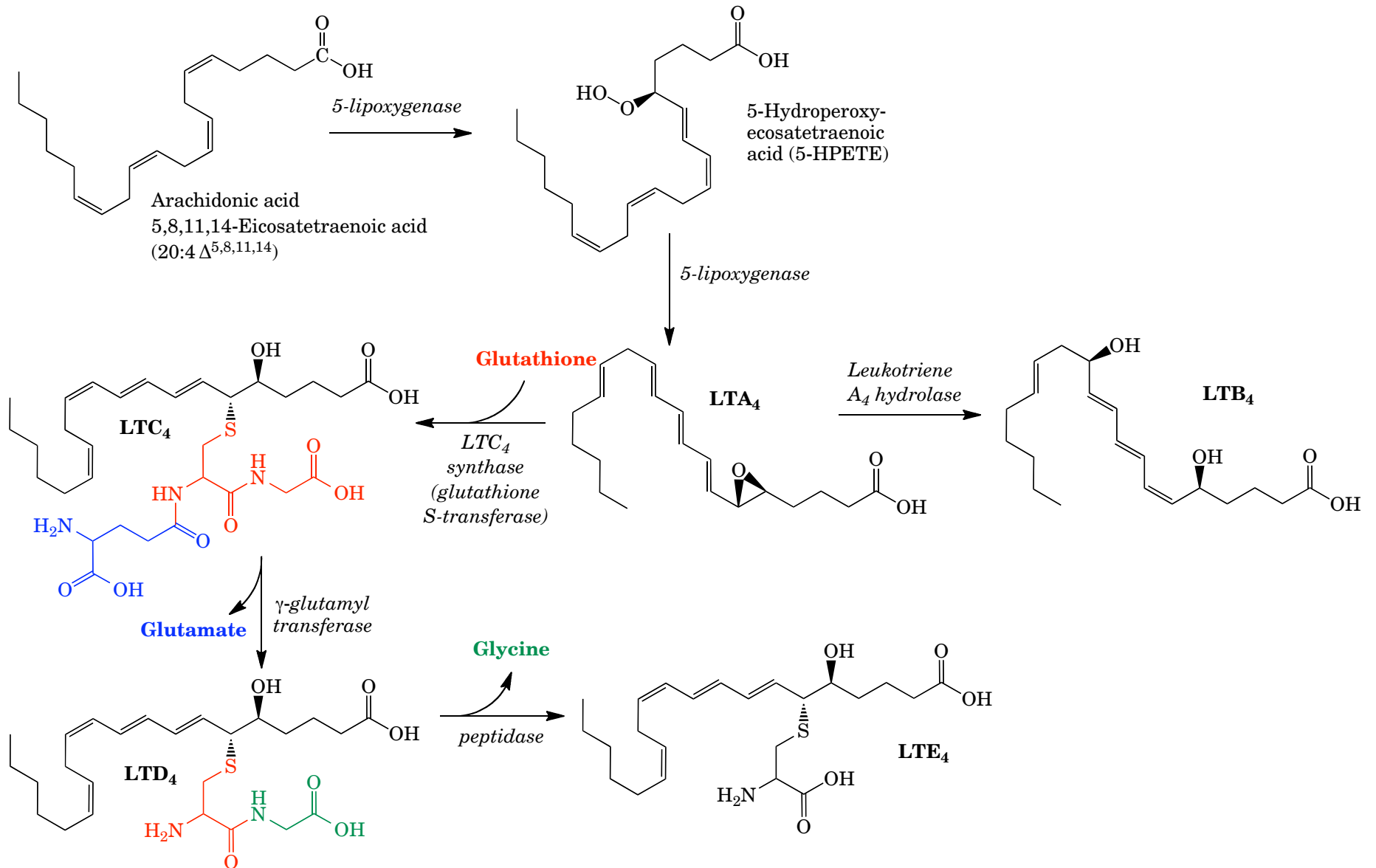
# Prostaglandin Synthesis



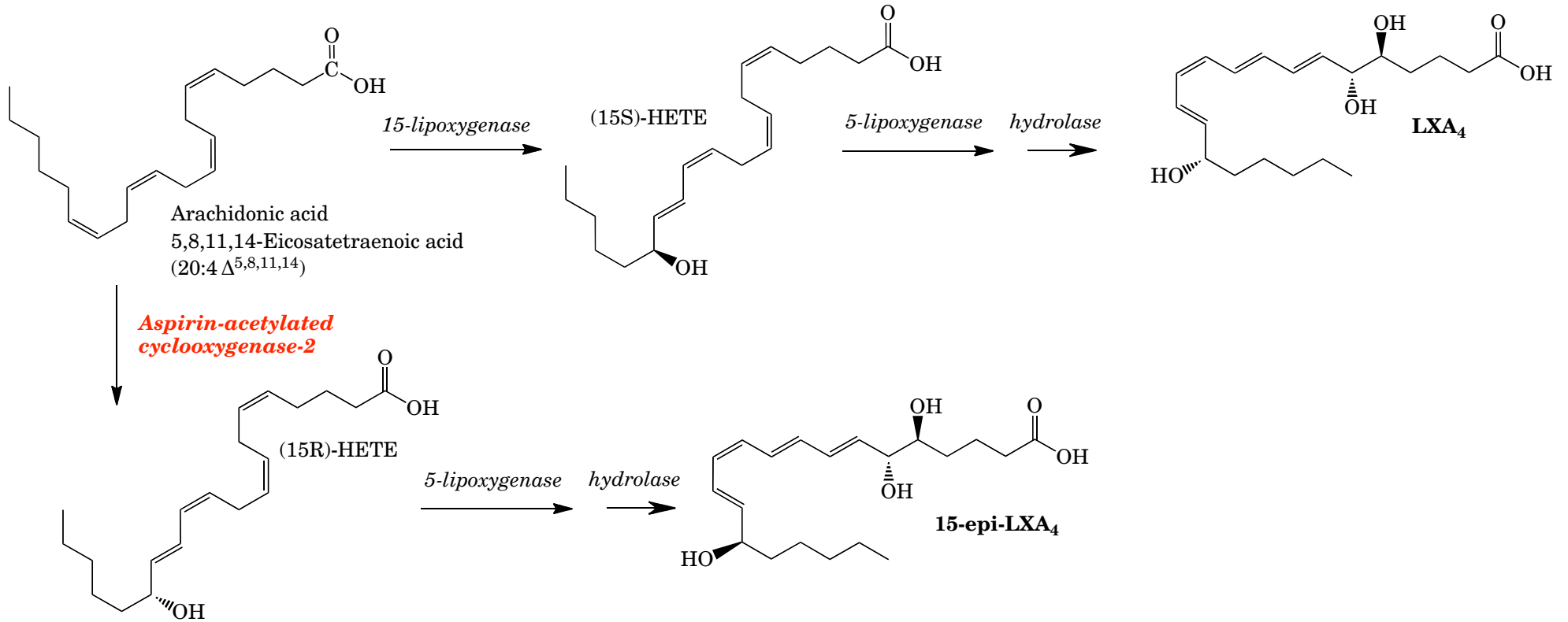
# Prostaglandin Synthesis



# Leukotrienes

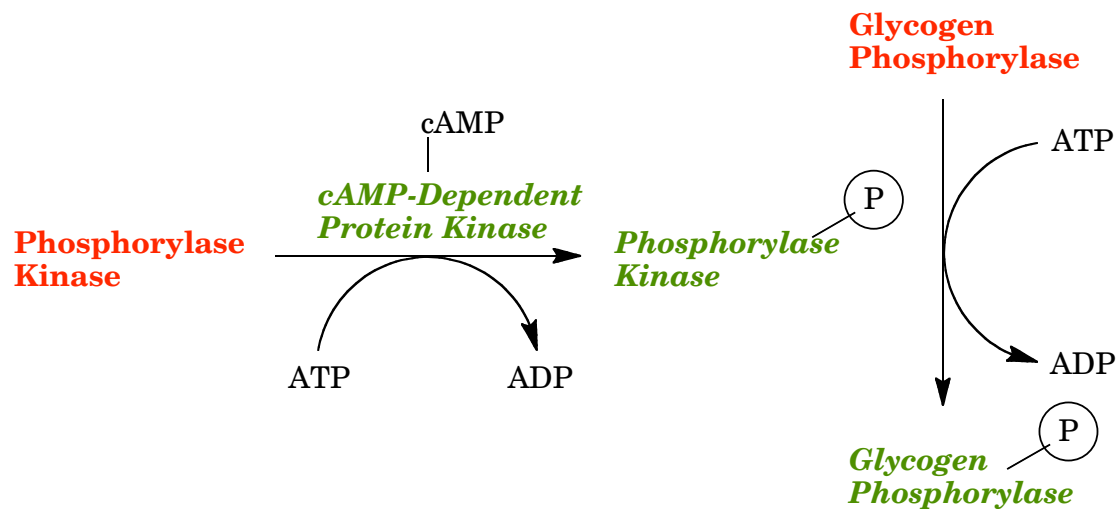
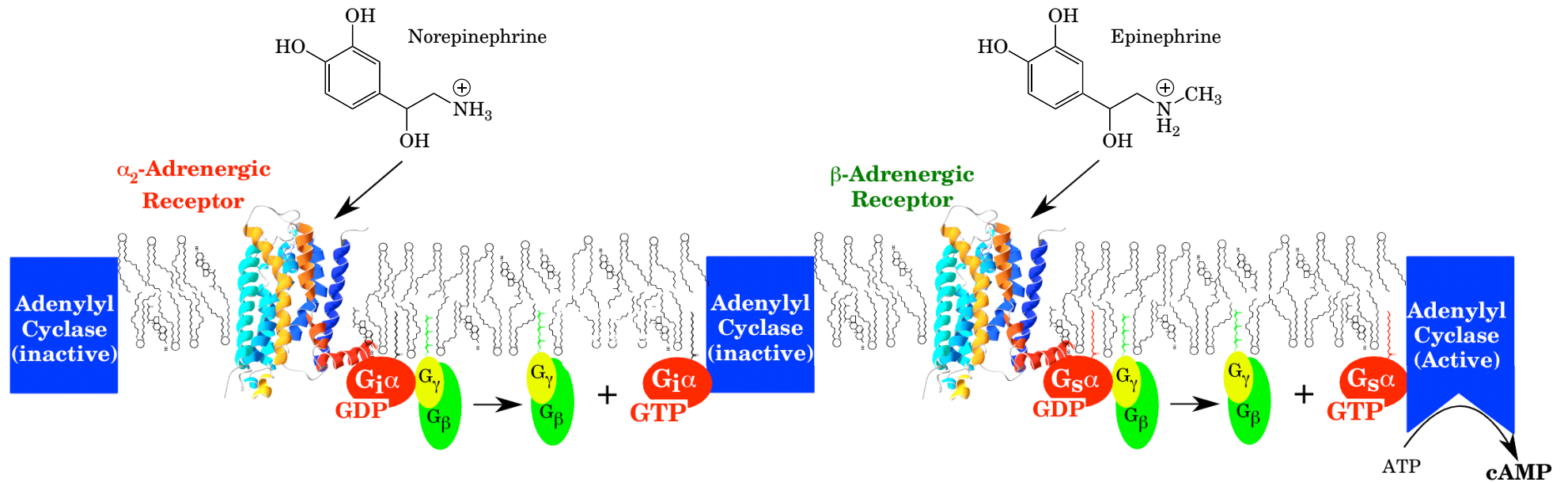


# Lipoxins

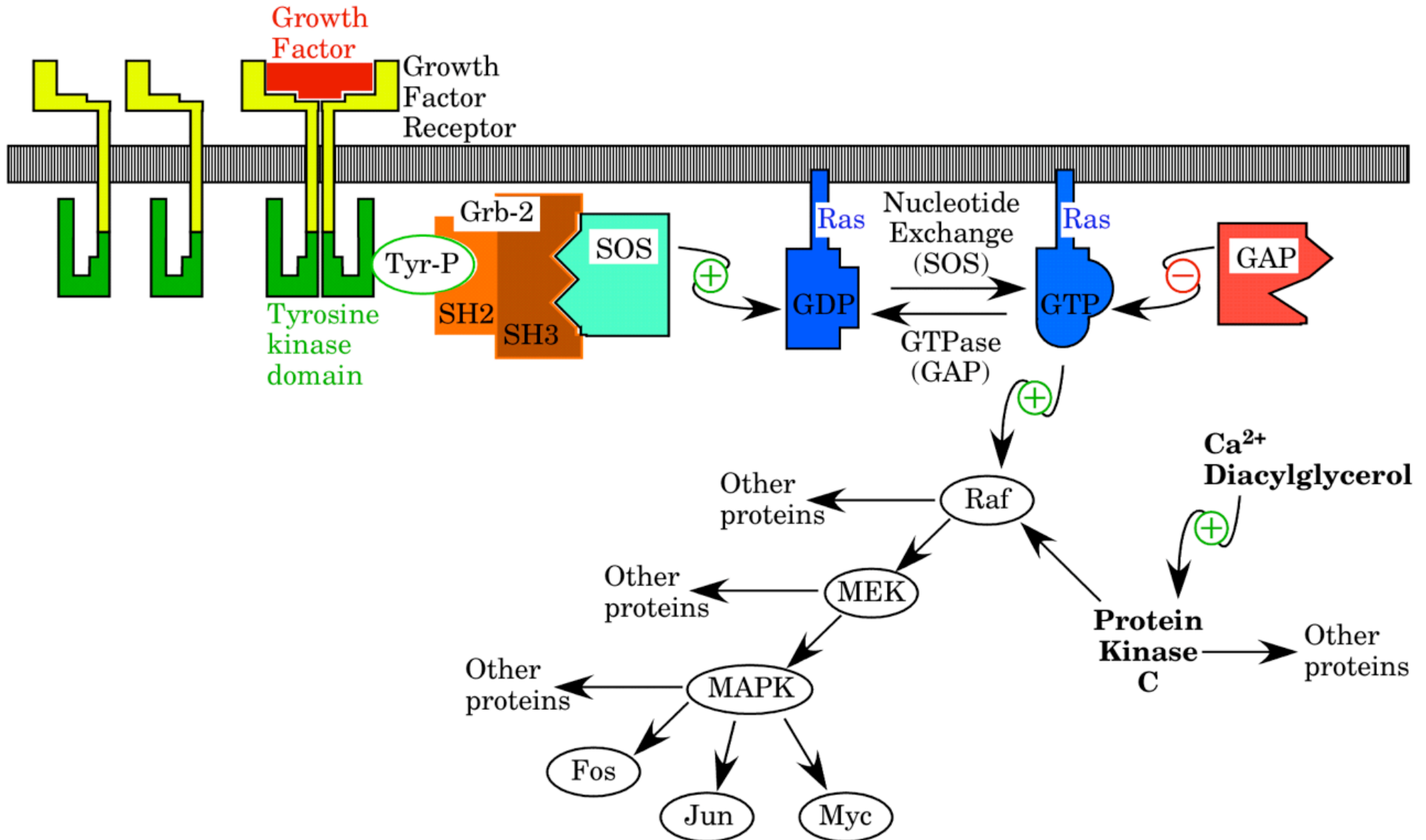




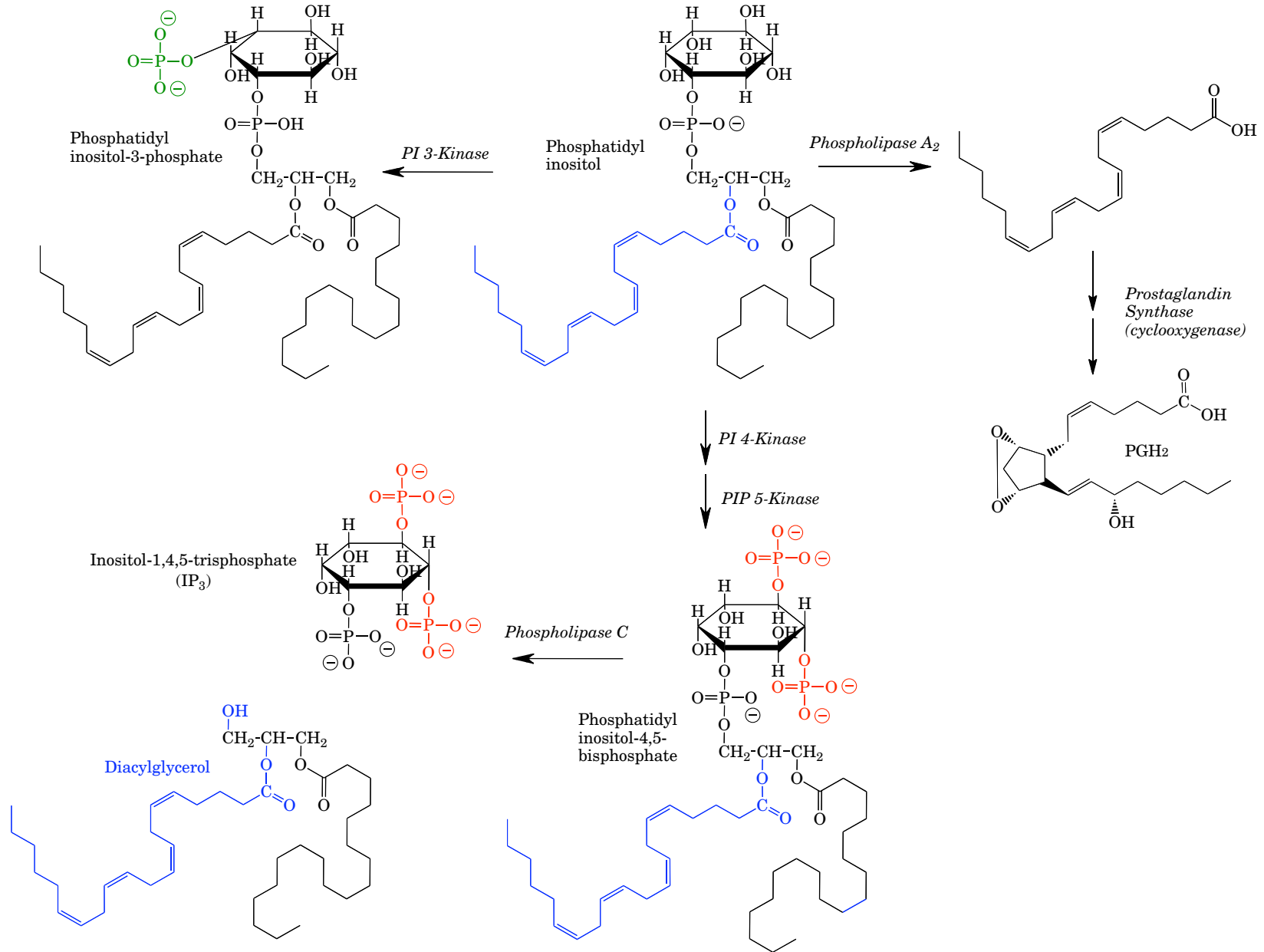
# G-Protein Coupled Receptors



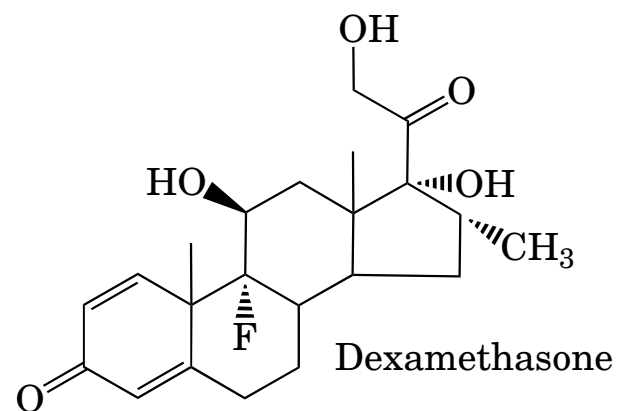
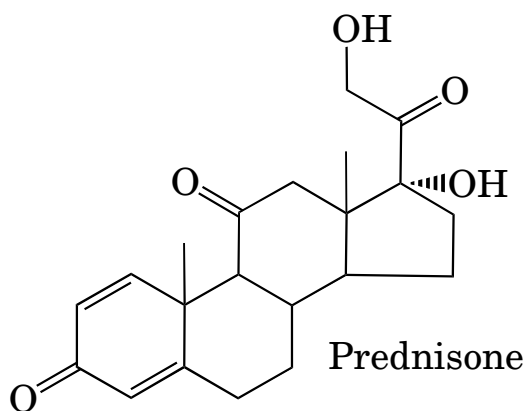
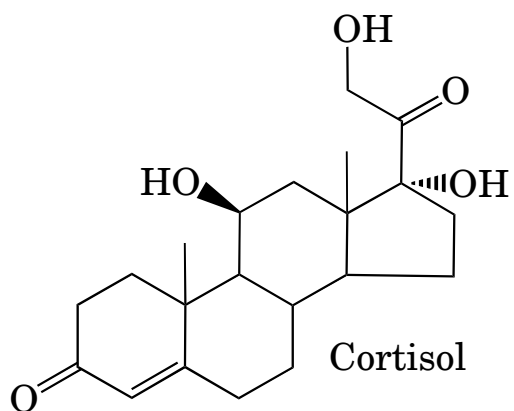
# More Signaling



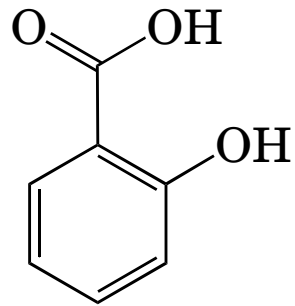
# Phosphatidyl Inositol



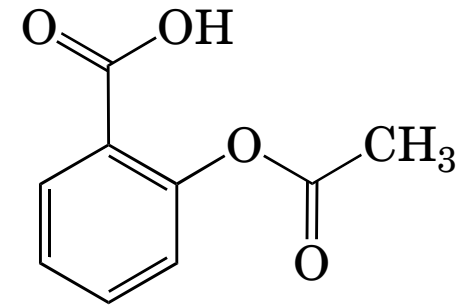
# Steroidal Anti-inflammatory Drugs



# Non-steroidal Anti-inflammatory Drugs

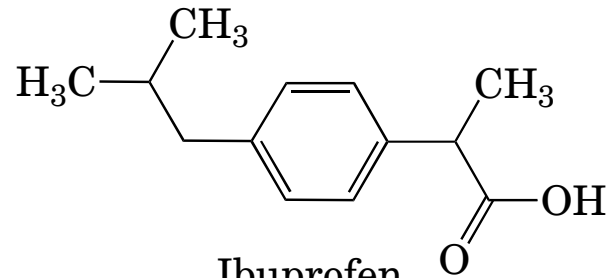


Salicylic acid  
[2-hydroxybenzoic acid]



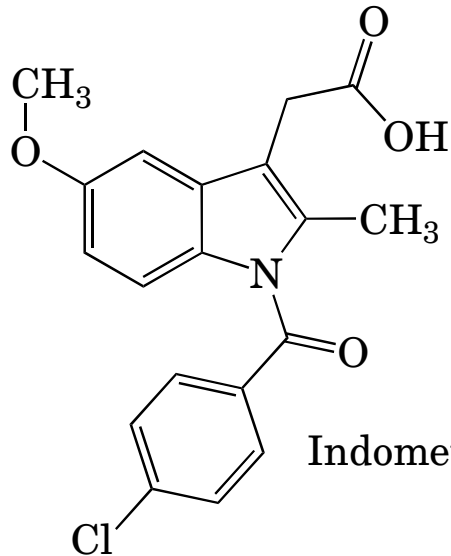
Aspirin  
[acetyl salicylic acid]  
[2-acetoxybenzoic acid]

# Non-steroidal Anti-inflammatory Drugs

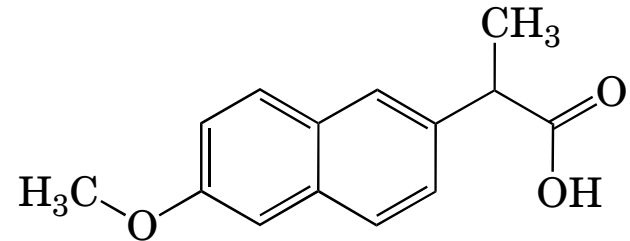


Ibuprofen

[2-(4-isobutylphenyl)propionic acid]



Indomethacin



Naproxen

[2-(6-methoxynaphthyl)  
propionic acid]

# COX Isoform Active Sites

*Pharmacol Rev*  
56:387–437, 2004

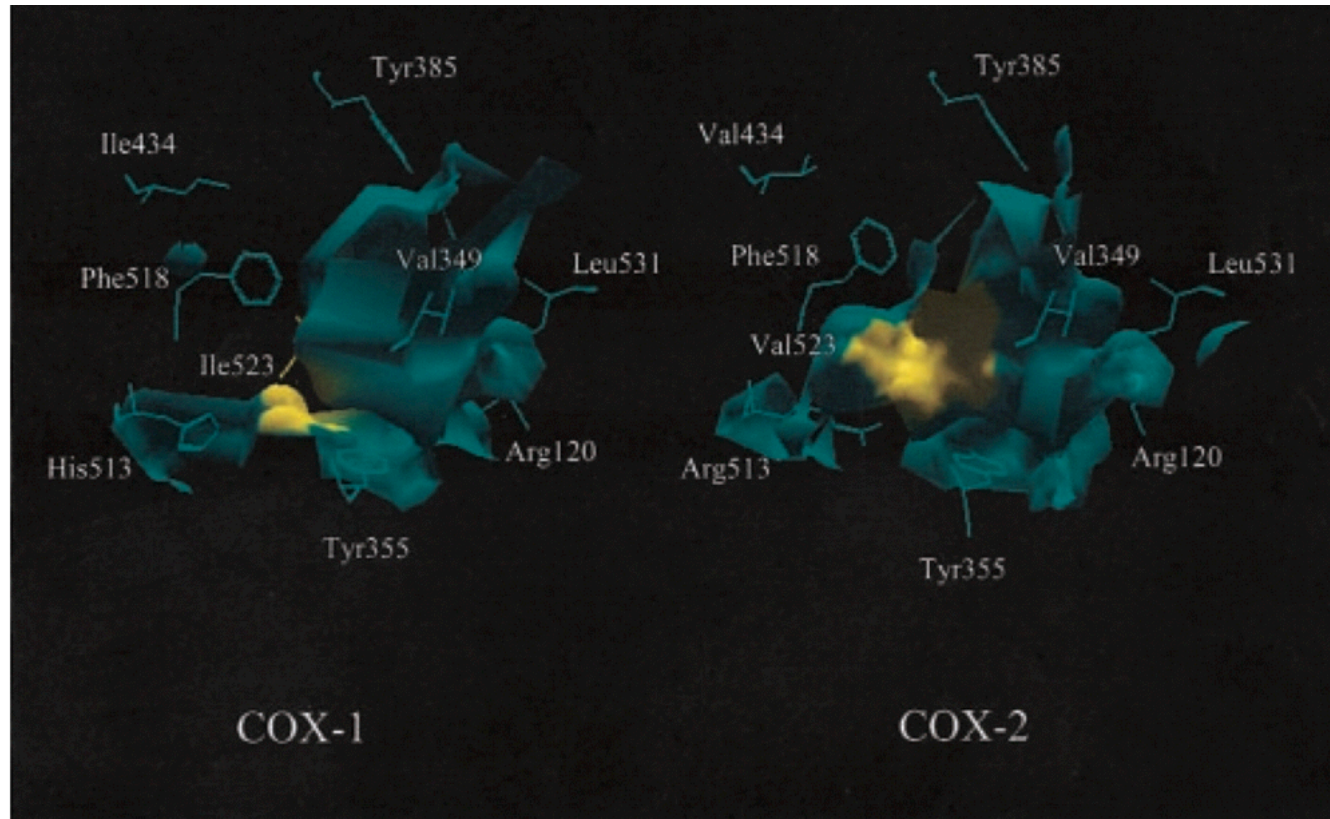
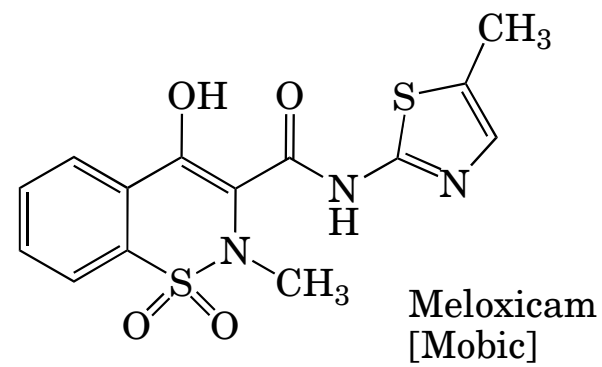
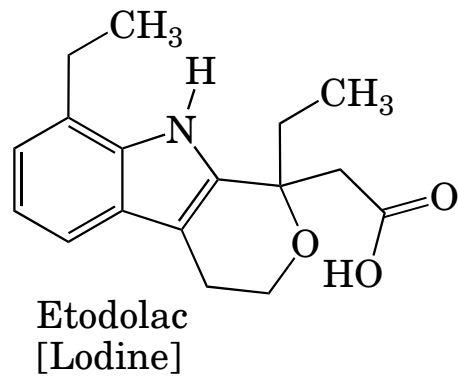
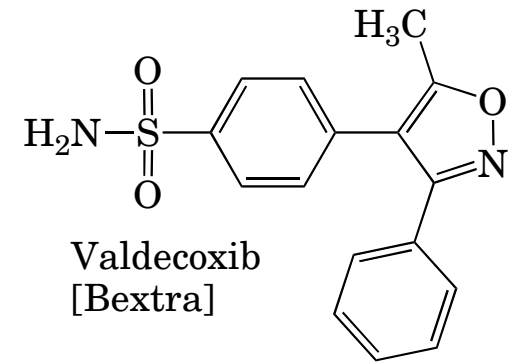
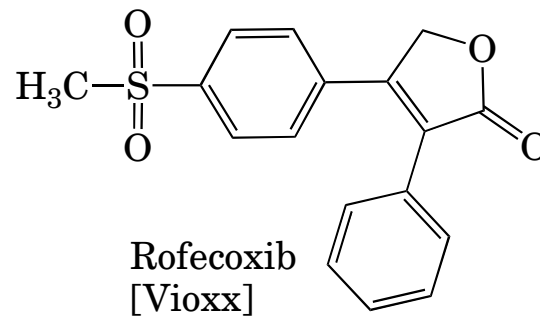
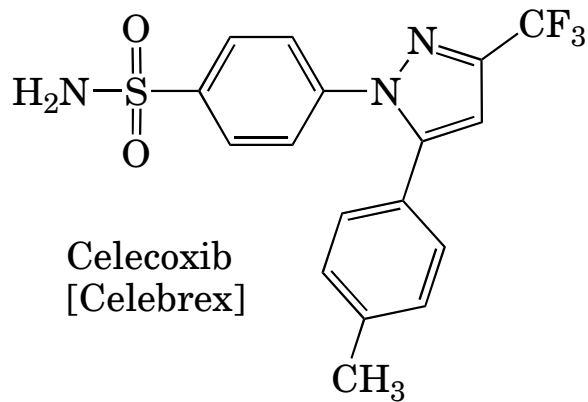
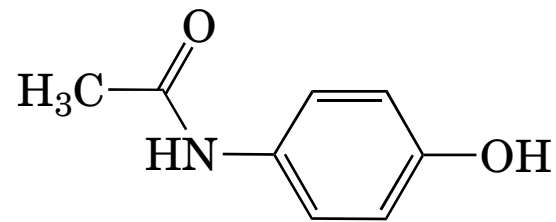


FIG. 8. Contour of COX-1 and COX-2 cyclooxygenase active sites. The solvent-accessible surfaces of the COX-1 and COX-2 active sites, with important surrounding amino acid residues, are shown. Highlighted in yellow on the left is the effect of isoleucine 523 on COX-1, which produces two prominent “bulges” into the active site. These bulges prevent aromatic substituents of some COX-2-specific drugs from accessing the leftward side pocket shown. The effect of valine 523 in COX-2, highlighted in yellow on the right, does not create these bulges and allows access of coxibs into this pocket.

# Non-steroidal Anti-inflammatory Drugs



# Acetaminophen



Acetaminophen  
Paracetamol  
[p-acetaminophenol]  
[N-(4-hydroxyphenyl)acetamide]  
[4-hydroxyacetanilide]

# Acetaminophen Metabolism

