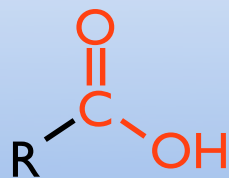


## Important Reaction for Biochemistry

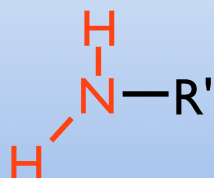
### Formation of an Amide

The don't call them functional groups for nothing

Carboxylic Acid

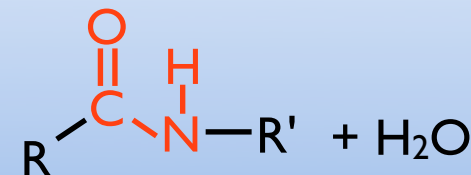
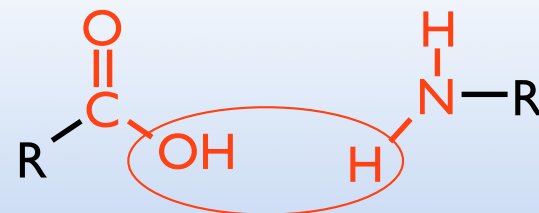


Primary Amine



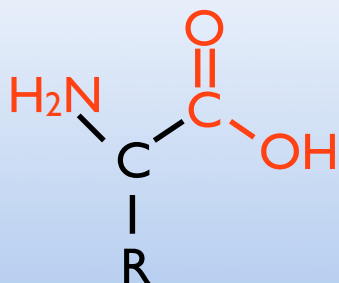
Carboxylic Acid

Primary Amine



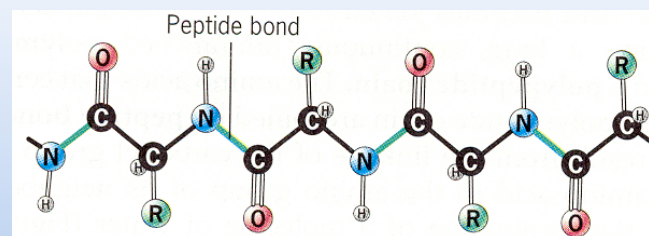
Amide + Water

### Amino Acid



Carboxylic End and Amine End  
Can react with itself  
(or similar molecules) in a chain

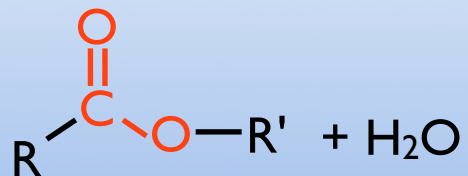
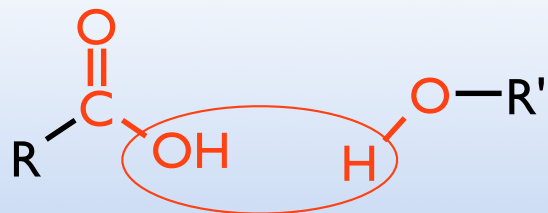
### Polypeptide



Two distinct ends  
N-terminus is an amine  
C-terminus is a carboxylic acid

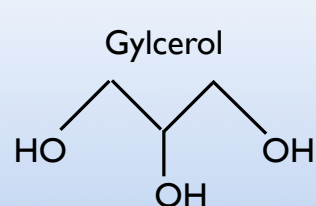
Carboxylic Acid

Alcohol

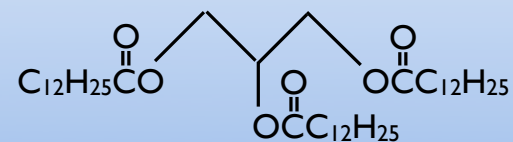
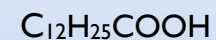


Ester + Water

Triglycerides



Fatty Acid  
(carboxylic acid with long chain)



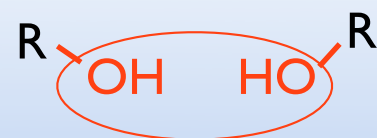
Makes Triglyceride

The three fatty acids can  
all be the same or different

High levels of triglycerides is linked to  
build up of plaque in the arteries  
= heart disease

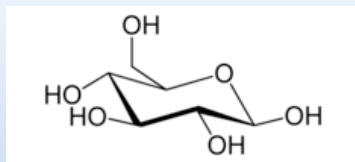
Alcohol

Alcohol



Ether + Water

## Sugars

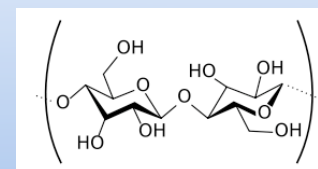
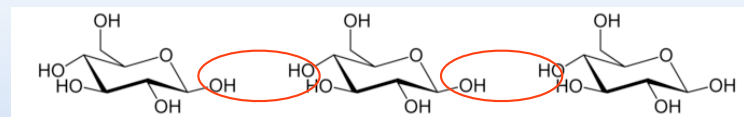


Glucose

(key factor for sugars lots of hydroxyls)

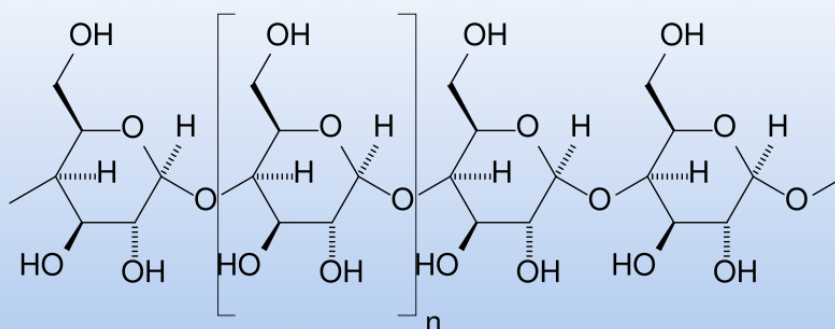
They can react to form chains of sugars  
polysaccharide

## Cellulose



Very long ether chain  
(pretty much all plant material)

## Polysaccharide (Starch)



Sugars, Carbohydrates  
monosaccharides (one)  
disaccharides (two)  
polysaccharides (many)

## Condensation Reactions (two molecules make one + water)

Carboxylic Acid + Amine = Amide + water

Carboxylic Acid + Alcohol = Ester + water

Alcohol + Alcohol = Ether + water