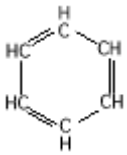
Important organic chemical **FUNCTIONAL GROUPS** found in biological molecules (R = any organic group)
This page is for reference. Learn these only as they are discussed in class. They should be memorized so we can talk about them easily.

NAME	GROUP	CHEMICAL EXAMPLE	COMMENT	BIOLOGICAL EXAMPLE
hydroxyl:	**-OH**	ethanol: CH_3-CH_2-OH	polar	sugars (e.g., fructose)
aldehyde:	**-CHO**	acetaldehyde: CH_3-CHO	polar	glucose
detail:	**O** **‖** **-C-H**			
carboxylic acid:	**-COOH**	acetic acid: CH_3-COOH	charged (ionized)	fatty acid (e.g., oleate)
detail:	**O** **O** **O$^-$** **‖** **<---> ‖** **<---> ‖** **-C-OH** **-C-O$^-$** **-C-O**			
amine:	**-NH_2**	methyl amine: CH_3-NH_2	charged (ionized)	amino acid (e.g., glycine)
detail:	**(-NH_3^+)**			
ketone:	**-CO-**	acetone: CH_3-CO-CH_3	polar	metabolic intermediate (e.g., pyruvic acid)
detail:	**O** **‖** **-C-**			
ether:	**-O-**	ethyl ether: CH_3-CH_2-O-CH_2-CH_3	not so polar (symmetric)	some lipids
ester:	**-COOR**	methyl ester of acetic acid: CH_3-CO-OCH_3	polar. not charged	fats (e.g., triglycerides)
detail:	**O** **‖** **-C-O-R**			
amide:	**-$CONH_2$**	acetamide: CH_3-$CONH_2$	polar, not charged	proteins (e.g., asparagine)
detail:	**O** **‖** **-C-NH_2**			
sulfhydryl:	**-SH**	2-mercaptoethanol: HO-CH_2-CH_2-SH	reducing agent	protein (cysteine)
disulfide:	**-S-S-**	R-S-S-R	crosslinks in proteins	protein (cystine)
phenyl:		phenol: C_6H_5-OH, Ø-OH	hydrophobic	proteins (phenylalanine)
anhydride	**O O$^-$** **‖ |** **-C-O-P=O** **|** **O-**	3-phosphogyceric acid: HOCH-CHOH-CO-O-$P03^{--}$	2 acids joined	intermediary metabolites
guanidino	**-N-C-NH_2** **H ‖** **$NH2^+$**	arginine: ^+H_3N-CH-CH_2-CH_2-CH_2-NH-C-NH_2 | ‖ COO- NH_2^+	charged	proteins (arginine)