

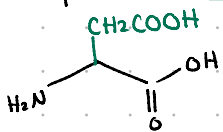
MEMORIZE

BIO/BIOCHEM

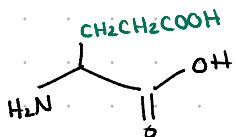
→ AMINO ACIDS

acidic - vely charged

aspartic acid **Asp/D**

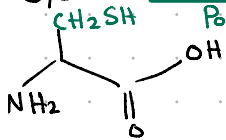


glutamic acid **Glut/E**

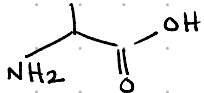


sulfur containing

cysteine **Cys/C**



methionine **Met/M** non polar

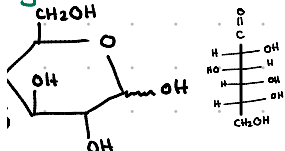


→ CARBOHYDRATES

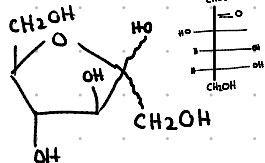
monosaccharides

D & C

glucose



fructose

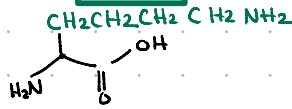


galactose

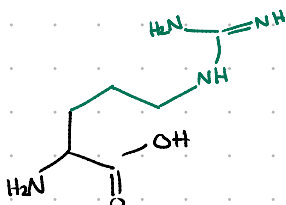


highest isoelectronic point
basic + vely charged

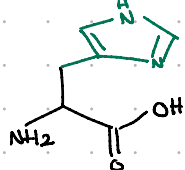
lysine **Lys/K**



arginine **Arg/R**

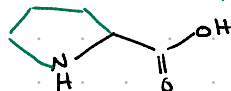


histidine **His/H**



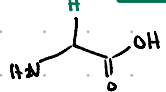
unique

proline **Pro/P** Non polar

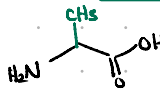


hydrophobic → aliphatic → aromatic

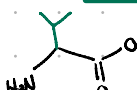
glycine **Gly/G**



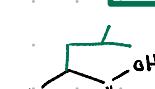
alanine **Ala/A**



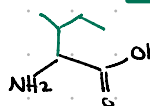
valine **Val/V**



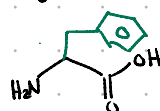
leucine **Leu/L**



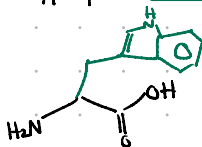
isoleucine **Ile/I**



phenylalanine **Phe/F**

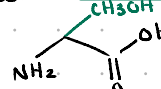


tryptophan **Tyr/W**

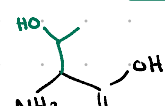


polar amino acids

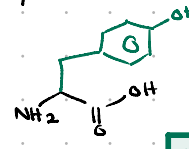
serine **Ser/S**



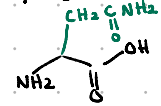
threonine **Thr/T**



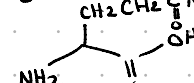
tyrosine **Tyr/Y**



asparagine **Asn/N**



glutamine **Gln/Q**



disaccharides

① maltose = glucose + glucose

reducing α-1-4

② sucrose = glucose + fructose

non reducing 1-1

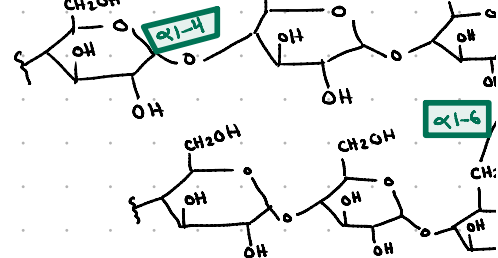
③ lactose = glucose + galactose

reducing β-1-4

polysaccharides

① glycogen = α-1-4 and α-1-6

* energy storage in animals ^{more branched}



② starch = α-1-4 and α-1-6

* energy storage in plants

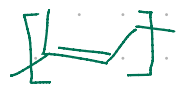
③ cellulose = β bonds

* cell walls in plants

♥ better at storing energy than carbs
 1) **triglyceride** = 3 fatty acid + glycerol backbone (3C sugar)
 ★ ester bond $R-O-C(=O)-OH$
 ★ energy storage in adipose tissue
 ★ fat transport in bloodstream

2) **phospholipid** = 2 fatty acids + phosphate head + glycerol backbone (3C sugar)
 hydrophobic hydrophilic
 ★ amphipathic
 ★ form cell membranes

3) **terpene** = multiple isoprenes $(C_5H_8)_n$
 ★ 2 isoprene → terpene
 ★ 3 terpene → squalene
 ★ precursor for cholesterol
 ★ can for Vitamin A

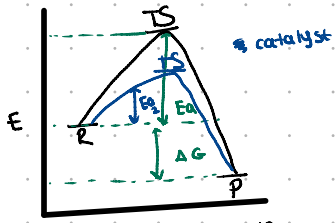


→ **VITAMINS**
 p395 - come back to this

→ **THERMODYNAMICS**

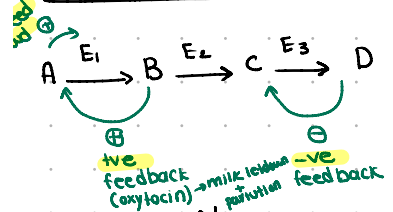
$\Delta G = \Delta H - T\Delta S$

-ve → spon exogenic
 +ve → non spon endothermic
 0 → eqim
 NOT changed by enzymes



entropy ↑ in universe
 coupling = spon rxn + unspon rxn → drive unspon rxn

→ **TYPES OF LOOPS**

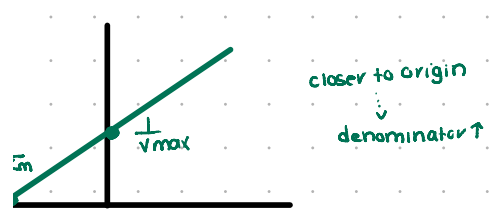


→ **INHIBITION**

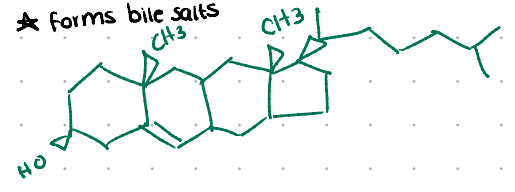
$V_{max} \rightarrow [E]$
 $K_m \rightarrow [S]$

comp	non	un	mixed
ACTIVE	ALLOSTERIC	E-S	E-S OR E unoccupied
$V_{max} -$ $K_{max} \uparrow$	$V_{max} \downarrow$ $K_{max} -$	$V_{max} \downarrow$ $K_{max} \downarrow$	$V_{max} \downarrow$ K_{max} depends

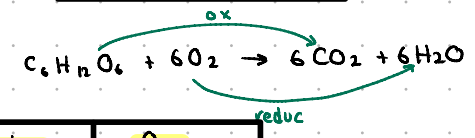
Lineweaver Burk



3- 6C rings + 1- 5C ring
 ★ precursor to estrogen and testosterone
 ★ regulates membrane fluidity + forms lipid rafts
 ★ forms bile salts

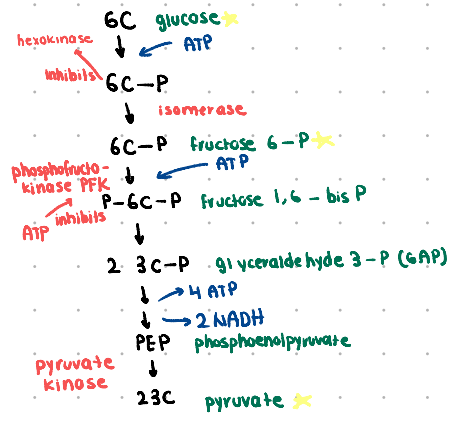


→ **CELLULAR RESPIRATION**

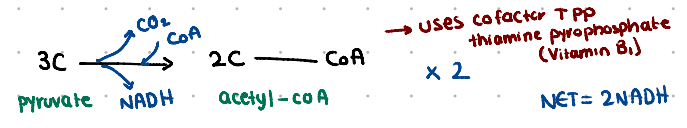


process	location	O ₂
glycolysis	cytosol	No
PDC/Krebs	matrix of mitochondria	Yes, indirectly
ETC/oxidative phosphorylation	inner membrane of mitochondria	Yes, directly

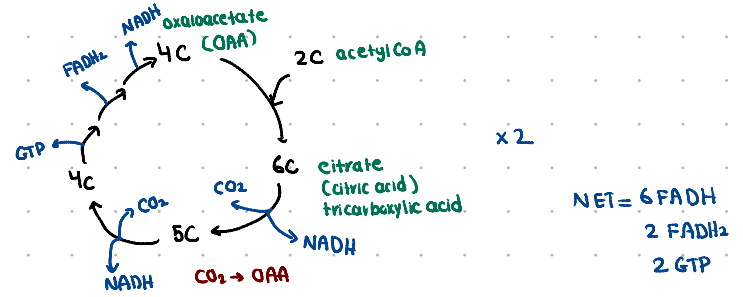
→ **GLYCOLYSIS**



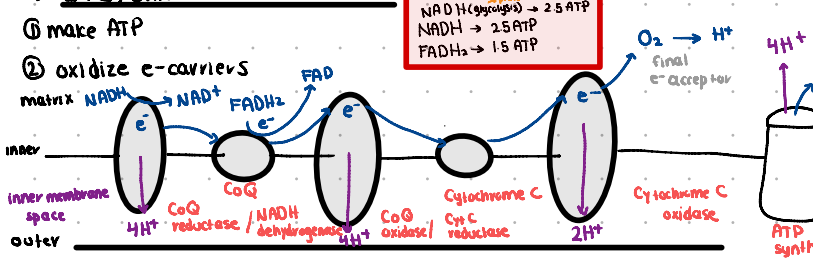
→ **Pyruvate Dehydrogenase Complex (PDC)**



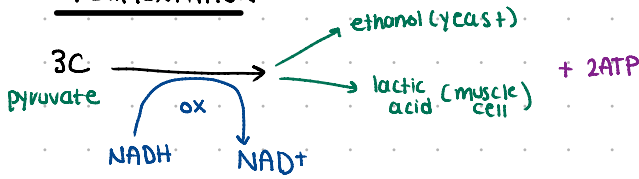
→ **KREBS**



→ **ETC/Oxidative Phosphorylation**

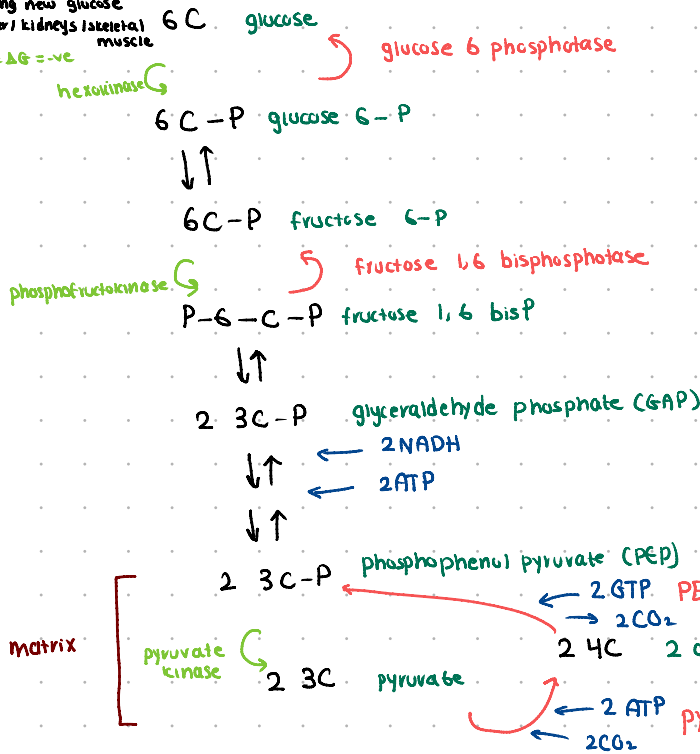


→ **FERMENTATION**

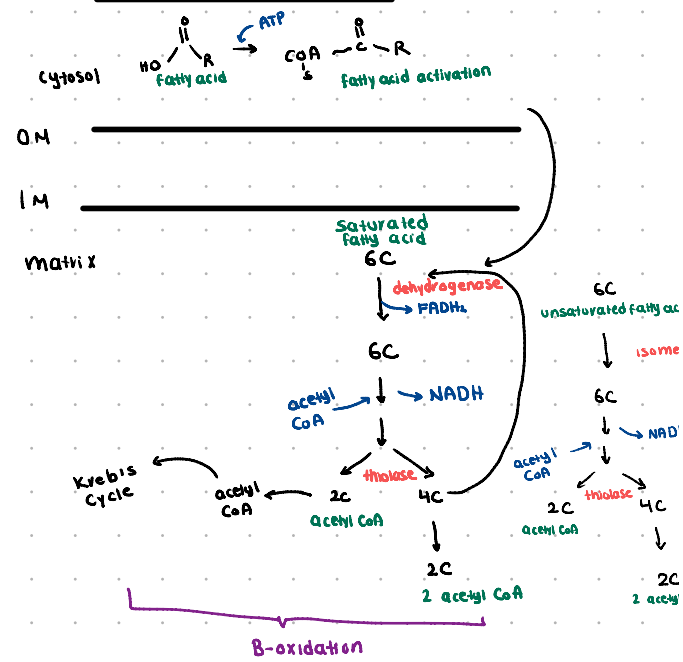


→ **GLUCONEOGENESIS**

making new glucose
in liver/kidneys/skeletal muscle

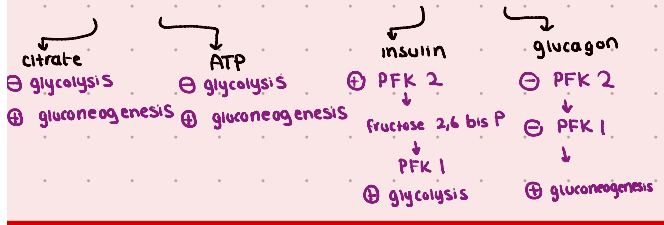


→ **FATTY ACID OXIDATION =**



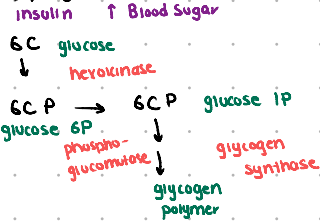
of cycles = # carbons - 1
odd # = 2 acetyl CoA + 2 Malonyl CoA

reciprocal regulation

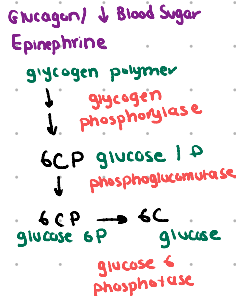


→ **GLYCOGEN METABOLISM**

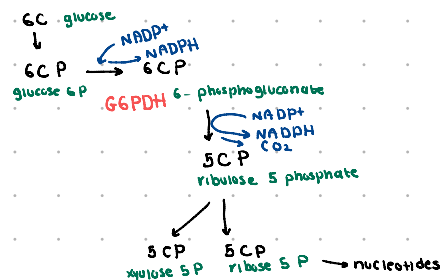
glycogenesis



glycogenolysis

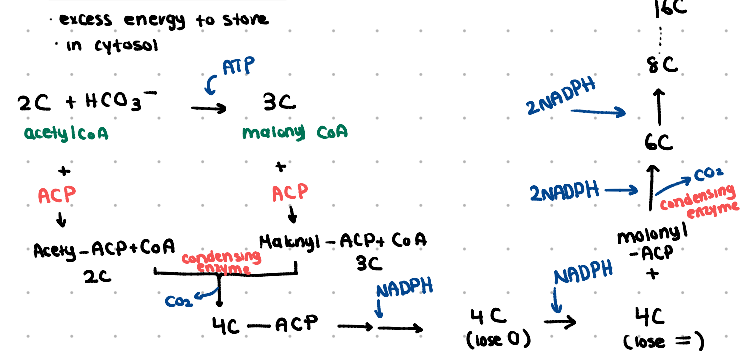


→ **Pentose Phosphate Pathway =**



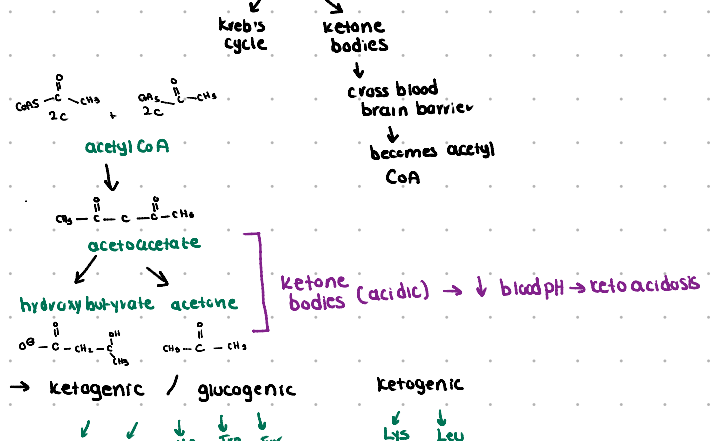
NADPH → neutralize ROS → no radicals → fatty acid synthesis

→ **FATTY ACID SYNTHESIS**

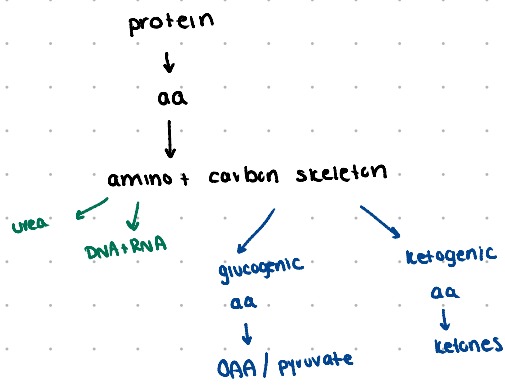


→ **KETOGENESIS**

long term starvation, blood glucose ↓, fatty acid oxidation occurs → ↑ acetyl CoA

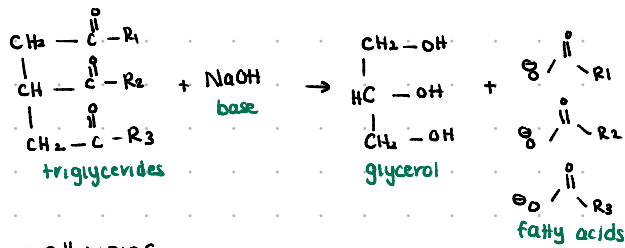


→ PROTEIN METABOLISM



→ SPONIFICATION

triglycerides + base catalyst = glycerol + fatty acids



→ "OTHER" LIPIDS

① sphingolipids = sphingosine + 2 fatty acids + phosphate

* sphingomyelin = myelin sheath of neurons

② waxes = long chain fats esterified to hydrophobic long chain alcohols

③ fat soluble vitamins =

A → vision
D → bone
E → antioxidants
K → clotting

④ prostaglandins = 20C fatty acids w/ different roles in tissues depending on receptor they are bound to (5 membered ring)

→ CLASSES OF ENZYMES

hydrolase	hydrolyzes chemical bonds
isomerase	rearranges bonds to form an isomer
ligase	forms a chemical bond
lyase	breaks chemical bonds w/out hydrolysis
kinase	transfers P group from a high energy carrier
oxidoreductase	runs redox rxns
polymerase	polymerization
phosphatase	removes P group
phosphorylase	transfers P from inorganic P
protease	hydrolyzes peptide bonds