CELLULAR RESPIRATION
making energy from food
(EX: GLUCOSE)

CYTOSOL | MITOCHONDRIA (O_2 reqd for entry)

1. GLYCOLYSIS
glucose is phosphorylated by adding P_i from 2 ATPs

glucose (6C) — substrate-level phosphorylation
- 2 ATP → 2 ADP + 2 P_i
- occurs in cytosol
- (2x) Triose Phosphate (3C)
- 4 ADP + 4 P_i → 4 ATP
- (2x) Pyruvate (3C)
- NAD^+ → NADH
- CO_2 (1C)
- acetate (2C)
- CoA
- acetyl CoA (2C)

NAD^+ is reduced which in turn oxidizes each pyruvate to acetate

Result:
2 ATP
2 NADH
2 Pyruvate

NADH & $FADH_2$ carry electrons to the ETC

2. CITRIC ACID CYCLE
aka KREB'S

occurs in MITOCHONDRIAL MATRIX

substrate-level phosphorylation

- 6C → 5C: CO_2; NAD^+ → NADH (red)
- ADP + P_i → ATP
- 5C → 4C: FAD → $FADH_2$ (reduced); NAD^+ → NADH (reduced)
- 4C → 6C: CoA
- 6C → 5C: NADH (reduced); NAD^+; CO_2

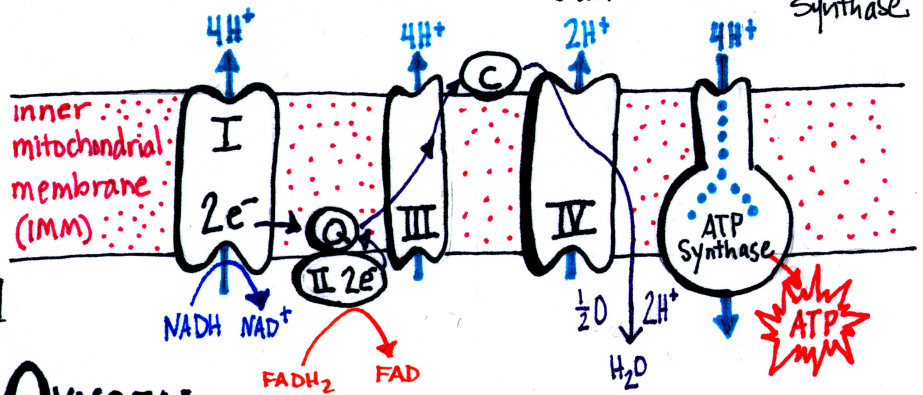
Result/glucose mol:
2 ATP
6 NADH
2 $FADH_2$
2 CO_2

3. OXIDATIVE PHOSPHORYLATION

ELECTRON TRANSPORT CHAIN (ETC) electrons are passed along a series of proteins releasing energy at each carrier

(H^+) protons are pumped across IMM

concentration gradient is established & H^+ move back into matrix via ATP synthase



OXYGEN is FINAL ELECTRON ACCEPTOR