BIG IDEAS

- SYNTH VS. BREAKDOWN
- COMPLETE BREAKDOWN
  - ADVANTAGE
  - HOW IT WORKS.

WHY DOES GLYCOLYSIS MATTER?

ENERGY OUTPUT.

SMALL CHANGE IN ENERGY ⇝ SMALL AMOUNT OF SUGAR.

SOMETIMES NEED TO MAKE GLUCOSE. HOW DO WE DO THIS?

HOW DO WE REVERSE THIS? ΔG ⇝ TOO BIG.

GLYCOLYSIS	GLUCONEOGENESIS
ATP → ADP: GLUCOSE → G6P (-15 kJ)	GLUCOSE → P_i
ATP → ADP: F6P → F1,6BP (-15 kJ)	→ P_i
ADP → ATP: PEP → PYRUVATE (-30 kJ)	

POINT:
CHOPPING OFF P_i WORKS FINE...
PEP REVERSE IS HARD.

MENTAL ENERGY INVESTED INTO KINASE VS. PHOSPHATASE.

LAST STEP ⇝ GLYCOLYSIS -8 kcal/mol

$PEP + ADP \longrightarrow PYRUVATE + ATP$

-0.2 kcal/mol:

$PEP + CO_2 \xrightarrow{ATP \rightarrow ADP} OXALO. + P_i$

$OXALO + GTP \longrightarrow PEP + GDP + CO_2$

SEEMS CRAZY... BUT PART OF KREBS CYCLE.

OVERALL:

$$2\,PYRUVATE + 6ATP + 2NADH \longrightarrow 1\,GLUCOSE + 6\,ADP + NAD^+$$
$$-6\ kcal/mol$$

METABOLIC PATHWAYS

	DEGRADATIVE	BIOSYNTHETIC
ENERGY:	YIELD	REQUIRED
ELECTRONS:	LOST (OXIDATION)	GAINED (MAINLY) ⇝ REDUCTION
REGULATION:	ACTIVATED BY LOW ENERGY → ACTIVATED BY EXCESS ENERGY.	SENSE [ATP]/[ADP]

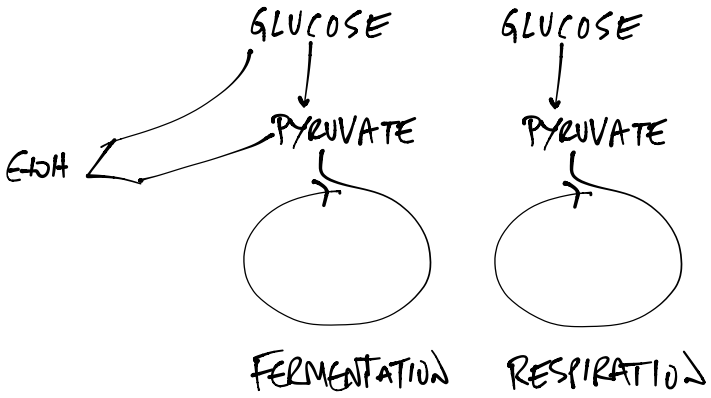
WHY DOES SHE TALK ABOUT HYDROGEN ATOMS RATHER THAN e^-?

KREBS CYCLE
- BURN $\bar{e}$
- BIOSYNTHESIS

KREBS CYCLE RUNS AT SAME RATE??

1 LB GLUCOSE → 4 PACKS OF RED VINES.

W/OUT K.C... 80 PKG!



COMPLETE OXIDATION OF GLUCOSE

1. GLYCOLYSIS ; 2ATP, 2NADH
2. PYRUVATE → ACETATE (X2) ⇝ 2NADH, 2 CO_2
3. 2ACETATE → KC ⇝ 4 CO_2 + 2GTP + 6NADH + 2 QH_2) 10 $NADH_2$, 2 $FADH_2$ } → 12 PAIRS OF $\bar{e}$:

$NADH_2$ → WORK! LIKE A BATTERY.
O_2

NADH RECYCLING : PYRUVATE → LACTIC ACID (PARKING $\bar{e}$)

PYRUVATE → ACETYCALDEHYDE → EtOH
↓ CO_2

FERMENTATION
GLUCOSE CCCCCC → CCC } → LOW ΔG

RESPIRATION CCCCCC → CCC → C } → HIGH ΔG.

GLUCONEOGENESIS

NOTED YOU CAN'T RUN GLYIOLYSIS

GLUCOSE: USED/DAY ON HAND 'BACKWARDS.

170 g GLUCOSE ~240 g