

Metabolism

metabolism def.: all chemical reactions in an organism
metabolic pathway:

molecule $\rightarrow$ x $\rightarrow$ y $\rightarrow$ product

* metabolic pathways are regulated by enzymes, catalysts.

Pathways can build up a product: ~~carb~~ ^{sugar} $\rightarrow$ carb
or breaking down products: carb $\rightarrow$ sugar

Pathways that build up: anabolic, consume energy
Pathways that break down: catabolic, give off energy

Bioenergetics: study of the flow of energy through organisms

Energy - capacity to cause change

Potential energy: energy based on location or structure

- gasoline, holding a ball in the air

- energy is then given off as heat

- bioluminescence: energy converted to light

- xantho flagellates (algae that glows)

Thermodynamics: study of energy transformations

- living systems are open systems: energy can go in or out

1st law: energy can not be created or destroyed
aka principle of conservation of energy

We often have long metabolic pathways this is b/c

- regulation is made easier

- energy is dissipated each step, in small amounts - this can be used to maintain things like temp. b/c heat output is constant