

## muscle physiology lecture 27

enzymes: primary players in metabolism and cell signaling cascades

metabolism is the sum of all your chemical reactions and those reactions are catalyzed by enzymes. don't just memorize meaningless lines. know vocab.

endorphins - opiates (similar composition to morphine) that you produce "endogenously" (inside your body as opposed to injecting it.) mostly in the pituitary gland although immune cells can produce them too.

reactants or substrates goes into an enzyme and a product comes out.

catalysis is the lowering of the activation energy (price) enzymes do not get used up during this process. enzymes work in a similar way to electrical sockets and plugs, there is a specific socket for every type of specific plug. when they bind and create that enzyme-and-substrate complex, there are many different consequences.

each consequence has a unique effect on your metabolism. there are also a variety of ways to control the enzymes themselves, to facilitate or inhibit their activity. any facilitation or inhibition of an enzyme will also have downstream metabolic implications.

allosteric control: allosteric activation = positive modulation, allosteric deactivation = negative modulation. competitive inhibition - they are both competing for the same "socket hole". noncompetitive inhibition - binds to an allosteric site but no change in substrate affinity. no preference regarding binding site. uncompetitive inhibition - potentiated by the substrate, only binds to the enzyme after the enzyme and substrate bind. mixed inhibition - same as noncompetitive but the inhibitor does have a preference of if the enzyme is free or complexed. suicide inhibition - irreversible reaction, inhibitors are substrates derived from the enzymes normal substrate. accumulation of product - phosphorylation toggling active/inactive forms. - phosphorylation - a phosphate is added to a protein, which affects its activity.