GLYCOGEN METABOLISM

Process	enzyme	noncarbohydrate		Comments	Regulation	
	Name	Substrate	Product		Activate Synthesis	Activate Degradation
Glycogenesis (synthesis)	UDPG pyrophosphorylase	UTP	PP_i	"activates" glucose; pyrophosphatase activity pulls reaction		
	glycogen synthase		UDP	glycogen starter protein needed (glycogenin); multiple regulation	dephosate enzyme; insulin	
	branching enzyme	Breaks α1-4 linkages	Forms α1-6 linkages	transfers 7 residue segment to form a branch		
Glycogenolysis (degradation)	glycogen phosphorylase	P_i		Form G1P without spending ATP; multiple regulation; can get to 4 residues away from branch		phosate enzyme; glucagon; epinephrine; Ca^{+2}
	glucose-6-phosphatase	H_2O	P_i	liver		
	debranching enzyme		4 residue limit branch removed	transfers 3 residue segments		
		H_2O		hydrolyzes α1-6 linkage of branch residue left after transfer		