

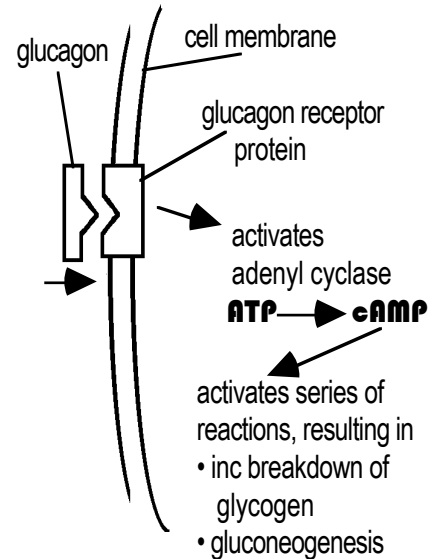
Review 08

Regulation of blood sugar (glucose) levels

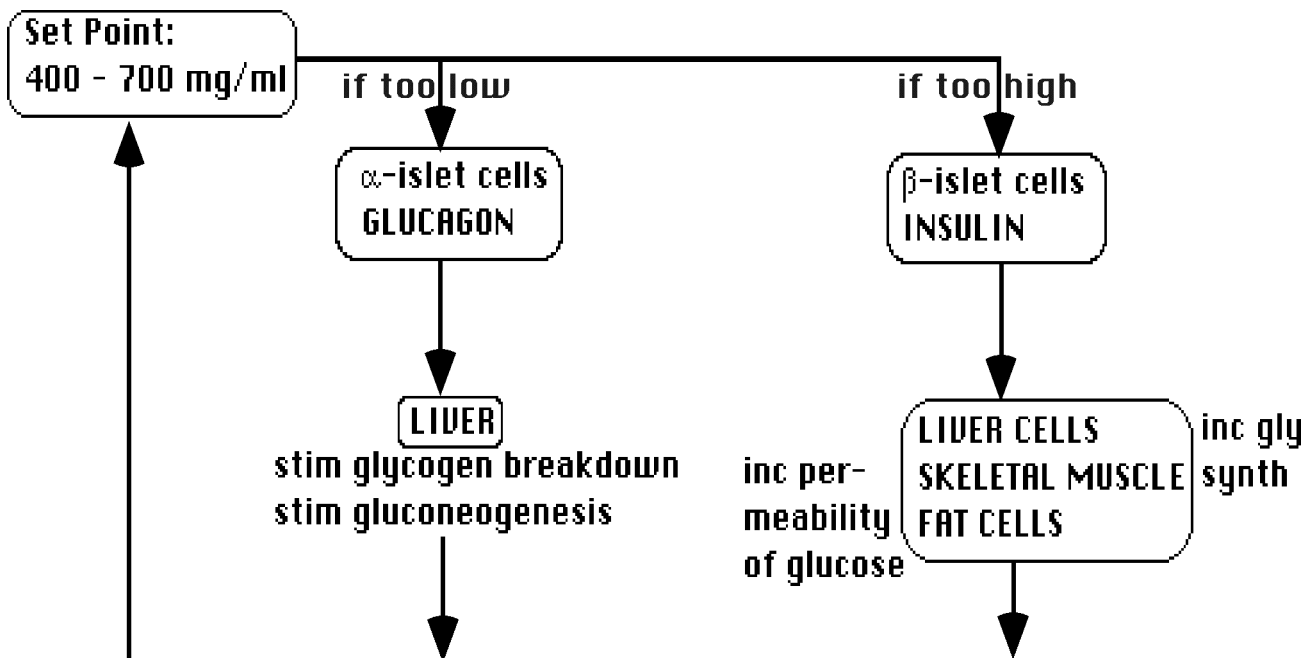
- effect of liver on blood sugar level
 - after meal, REDUCES level
 - long after meal, INCREASES level
 - therefore, liver acts as effector
- sensors: alpha-islet and beta-islet cells of pancreas
- communication: hormones glucagon and insulin
- effectors: liver, skeletal muscle and fat cells

α -islet cells detect low glucose level, release **GLUCAGON** which targets **LIVER**, causing breakdown of glycogen and increase in gluconeogenesis

β -islet cells detect high glucose level, release **INSULIN** which targets **LIVER** and **SKELETAL MUSCLE**, stimulating glycogen manufacture and also targets **SKELETAL MUSCLE** and **FAT CELLS**, causing them to take up more glucose from blood



Homeostatic control diagram for maintaining blood glucose levels:



- Read about diabetes mellitus and hypoglycemia, pages 31 & 32 in lecture notes

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Respiratory System: function is GAS EXCHANGE (via lungs in most land animals, gills in aquatic animals, through skin in some)

- ✓ air is mixture of gases, inc. oxygen, carbon dioxide, nitrogen, etc.
- ✓ atmospheric pressure measured with barometer; pressure varies with altitude and weather; at sea level on a clear day ~760 mm Hg (=760 Torr)
- ✓ contribution of any one gas to atmospheric pressure =

% of particular gas in air × total air pressure

- ✓ gases move from regions of higher partial pressure to regions of lower partial pressure via DIFFUSION
- ✓ gas exchange takes place in the lungs
 - occurs within alveoli
 - because of low rate of air exchange during breathing at rest, alveolar air is very different in composition compared to atmospheric air:

	atmospheric air	alveolar air*
oxygen	157 mm Hg	100 mm Hg
carbon dioxide	0.3 mm Hg	40 mm Hg