

Diabetes and Blood Glucose

Type I Diabetes (Insulin Dependent)

- ✓ B islets low, non-functioning
- ✓ Due to autoimmune disorder
- ✓ Typically starts when young

Type II Diabetes (Non Insulin Dependent)

- ✓ Low receptor or post-receptor signaling events
- ✓ Poor regulation of Glut Transporter 4 in muscle
- ✓ Increased by obesity
- ✓ May need to supplement endogenous insulin by injection

Insulin release by pancreas results in a decrease in Blood Glucose levels.

- ✓ where does the bld glc go?
- ✓ What happens when bld glc levels are too high (short term and long term)?
- ✓ What happens with too much insulin or insulin w/o high blood glc?

Cancer and Glycolysis

- ✓ Tumors show high rates of metabolism
- ✓ Increased glucose uptake and glycolysis is to be to meet the need of increased cancer cell growth
- ✓ Resulting O₂ use due to glycolysis results in hypoxic condition in small nascent tumors.
- ✓ Gene expression of HK, PFK, Aldolase, GAPDH, PK, Enolase, PLK and LDH are all increased in hypoxia induced cancer cells
- ✓ Hypoxia also increased vascular endothelial growth factor (VEGF) - stimulated angiogenesis.
- ✓ Lactic acid is produced and cells transport intracellular H⁺ to extracellular space.
- ✓ Increased extracellular acidity activates proteases required for the activation of proteases (matrix metalloproteinases) which degrade protein glue (extracellular matrix) around cells. This allows blood vessels to move into tumors and tumors to escape.