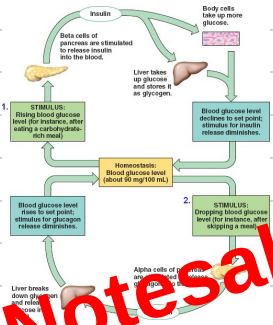
METABOLIC DISORDERS:



INSULIN OR GLUCAGON?

INSULIN:

- released when blood glucose levels are high
- increases the rate of glucose uptake and cell metabolism
- effects: hypoglycaemia

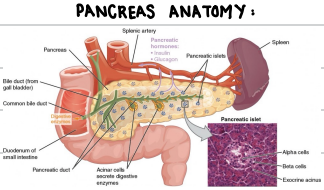
GLUCAGON:

- released when blood glucose levels are too low
- stimulates liver to release glucose to blood, therefore increasing blood glucose levels
- effects: hyperglycaemia

DIABETES MELLITUS:

- disorder of carb metabolism in which sugars in the body are not oxidised to produce energy due to a lack of insulin or the body develops resistance to it
- it is estimated to affect 537 million people worldwide (IDF Diabetes Atlas 2021)
- we are often the 1st practitioners to become aware of the disease in patients

PANCREAS ANATOMY:



INSULIN SECRETION:

- secreted by pancreatic β-cells in response to rising glucose levels
- GLUT2: ↑ glucose uptake = glycolytic phosphorylation = ↑ of ATP:ADP ratio
- this rise inactivates K^+ channel that depolarises the membrane, ∴ Ca^+ channel opens and Ca^+ ions flow in
- the rise in Ca^+ ions leads to exocytotic release of insulin from the storage granule

HOW INSULIN WORKS:

- insulin binds to receptor
- this induces a signal transduction cascade
- this allows glucose transporter (GLUT4) to transport glucose into the cell
- most of the cells in our body carry insulin receptors in their membranes – once bound to one of these receptors, the cell recieves a signal to begin enzyme controlled reactions: these change the metabolism of the cell
- the binding process leads to ↑ glucose uptake of the cell
- EXCEPTIONS: brain and liver because these cells are readily permeable to glucose