

School of Medical and Allied Sciences

Course Code : BPHT5003

Course Name: Pharmacology II



Insulin

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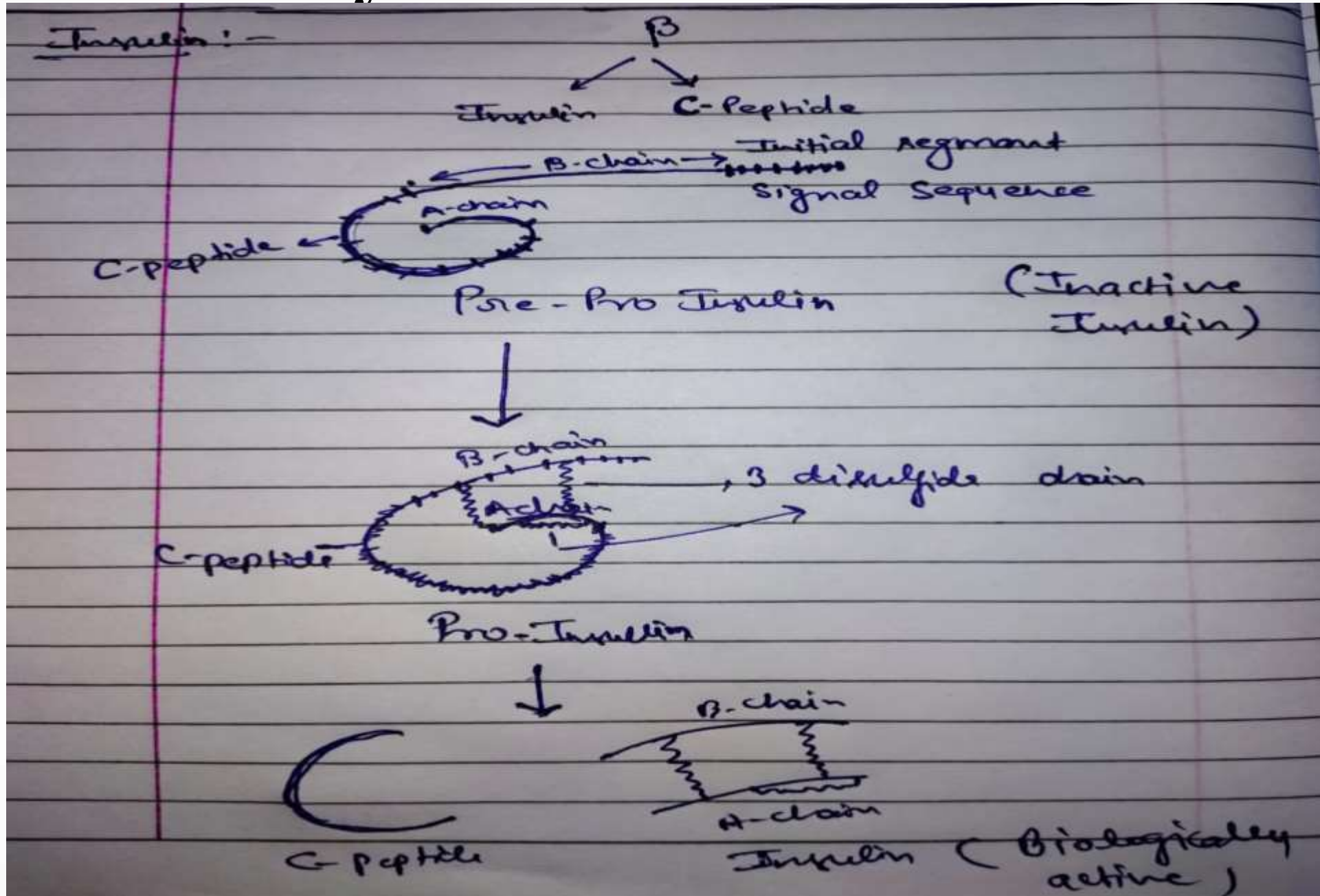
Insulin

- Insulin is a two chain polypeptide having 51 amino acids and MW about 6000, Synthesized in pancreatic β cells of Pancreas as endocrine function.

Physiological function of insulin

- Insulin increase the uptake/absorption of glucose and glycogenesis in the liver, skeletal muscle etc.
- Insulin inhibits the gluconeogenesis and protein break down means facilitate positive Nitrogen balance.
- Insulin inhibits lipolysis and favours triglyceride synthesis.

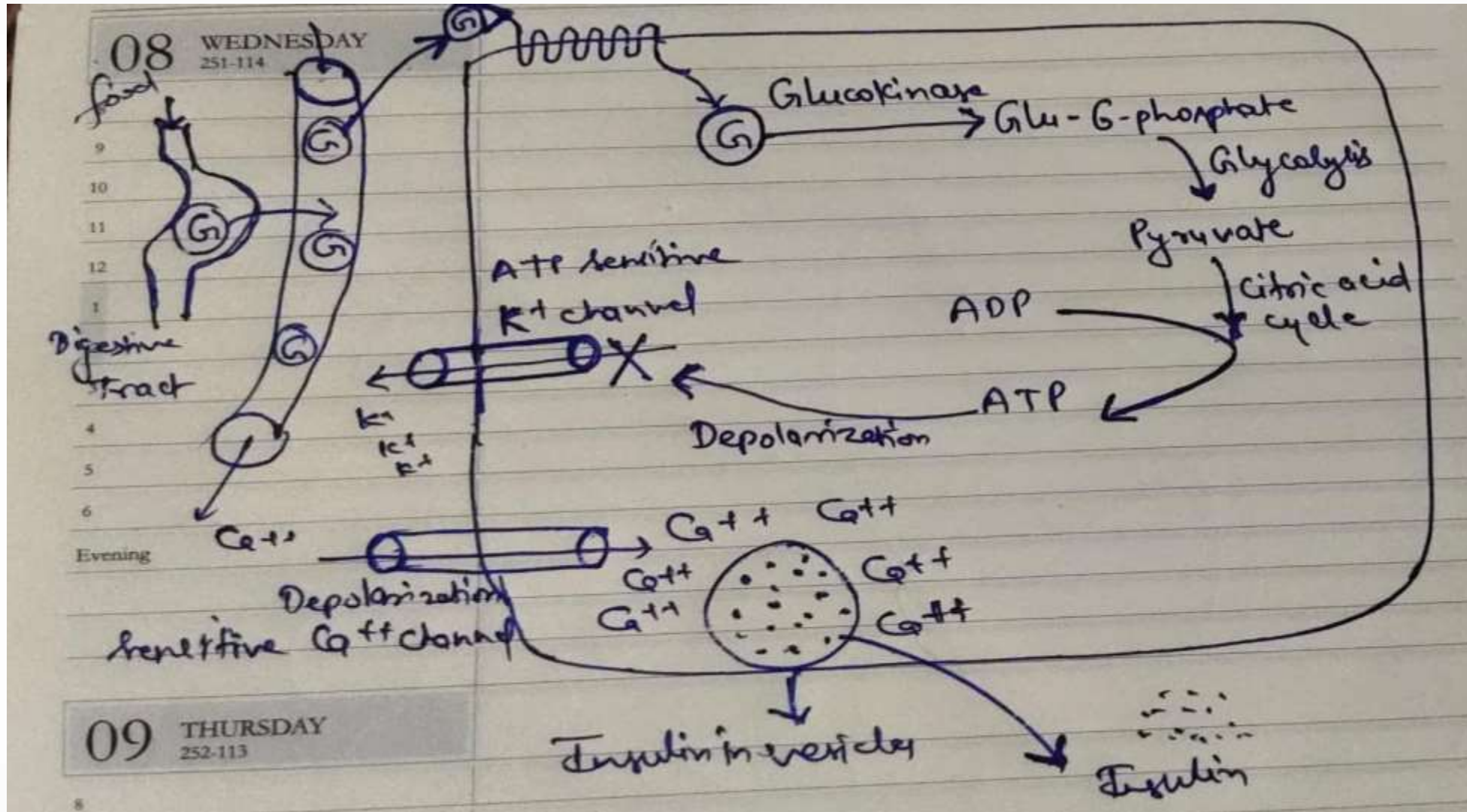
Synthesis of Insulin:



Regulation of insulin secretion

- β -cell has glucoreceptor which is activated by the glucose \rightarrow glucose enters in the cells through glucose transporter and indirectly inhibits to the ATP sensitive K^+ channel and intracellular Ca^{2+} \rightarrow secretion of insulin.
- Somatostatin (GHIH) inhibits insulin as well as glucagon.
- Insulin inhibits the glucagon secretion.
- Glucagon increases/stimulates the release of insulin as well as somatostatin.

Release of Insulin



MOA of Insulin

Insulin acts through membrane kinase receptor which has enzymatic activity.

Insulin receptor (heteromeric receptor) consisting of 2 extra cellular α and 2 transmembrane β subunit linked together by disulfide bonds. Insulin binds with α subunit then activation of tyrosine kinase which is attached with β subunit \rightarrow activated tyrosine kinase phosphorylated \rightarrow metabolic reaction of insulin.

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