



NTNU – Trondheim
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Department of Biology

Examination paper for BI 2012 Cell Biology

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Exam Questions BI 2012 summer 2015

All three questions count as equal.

Question I Cell-cell adhesion

- A) Collagen fibers are essential components of the extracellular matrix in animals. Describe the steps leading to their production starting after the precursors are released from the ribosomes into the ER.
- B) Compare and contrast an adherens junction with a desmosome.
- C) Gap junctions consist of connexins, which mediate the metabolic and electrical coupling of adjacent cells. Connexins are constantly turned over. Design an experiment to visualize the turn over process.

Question II Transport

- A) Receptor-mediated endocytosis is an important mechanism to selectively import macromolecules into a cell. Explain the mechanism using an example from the course.
- B) Hydrolases are enzymes, which break down macromolecules in lysosomes. Their activity is tightly controlled. Describe the mechanisms responsible for targeting and control of enzyme activity.
- C) Observation: Different receptors seem to meet different fates after internalization. Describe an experiment to examine the internalization of two different receptors and test if they do meet different fates.

Question III Membranes

- A) Membranes surrounding animal cells are associated with many different proteins performing diverse functions. Provide an overview of the 8 main classes and give examples for a protein membrane anchor and a protein modification.
- B) Compare and contrast the two most common mechanisms responsible for active transport across a membrane in animal cells.

Describe experiments and techniques to detect whether lipid molecules in a membrane layer preferentially flip-flop or swap places with neighbors.

