

Exercises Lecture 1

- 1- In eukaryotic cells, which organelles contain DNA?
- 2- Briefly explain what endosymbiont theory is.
- 3- What would be an argument against the endosymbiont theory?
- 4- What are the functions of the nucleus?
- 5- What are the three embryonic layers in development?
- 6- What do we mean by totipotency of a cell?
- 7- What enables cells to stick together and form a tissue and an organ, rather than just falling apart?
- 8- How did we find out about most functions of different brain regions, for example that the frontal lobe is important for higher cognitive functions?
- 9- Which embryonic layer gives rise to the developing brain?
- 10- What are the three anatomical axes used to study the brain's anatomy?
- 11- What are the lobes of the cerebral cortex? What are the associated functions with each lobe?
- 12- What are the five vesicles of the developing neural tube?

Exercises Lecture 2

- 1- What is the structure of the DNA?
- 2- What is the direction of DNA replication? Briefly describe the process of DNA replication.
- 3- How many naturally occurring amino acids are there?
- 4- In DNA, nucleotides bind in a specific way, A to T, and C to G. Provide some reasoning for this. What kind of a bond is this?
- 5- Triplets of nucleotides can serve to start or finish transcription (start codons and stop codons). Which ones start and which ones stop transcription? Why do these particular combinations serve for starting or stopping transcriptions and not others?
- 6- What percentage of DNA codes for proteins?
- 7- Within genes, there are coding parts of DNA and non-coding parts. What does the non-coding DNA do?
- 8- How can mutagens lead to changes in the DNA?
- 9- What are the different types of RNAs that play a role in protein synthesis, and what are their roles?
- 10- What are the different levels of protein structure?
- 11- What are the functions of transcription factors?
- 12- Describe alternative splicing. Why is this process important?
- 13- What is cell fate and differential gene expression? Explain briefly.