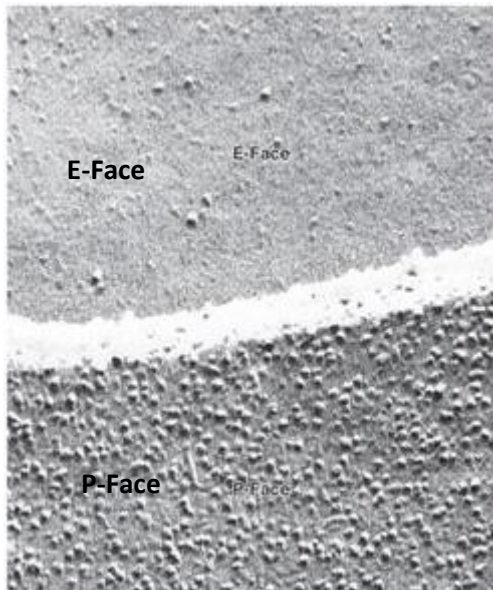




Identify the cellular organelle shown in the photo and complete the text below. 5 points



This is the _____ cell membrane _____,
whose layers are exposed by a special technique, called
freeze-fracture electron microscopy. The little grains
visible are _____ membrane proteins _____,
which operates e.g. as _____ receptors _____
by binding ligands from the extracellular space or as _____
transporters _____ or _____
ion channels _____ by transmitting ions or other small

molecules like transmitters, respectively.

Decide whether the statements are true (T) or false (F). Explain your answer in both cases.
(5 points)

In humans organs of special senses are all located in the head: _____ T _____

Tasting, smelling, seeing, hearing, balancing (sztem ha a tapintást is idevesszük akkor F is lehet)

Clustering neurons in the PNS form nuclei. _____ F _____

Clusters of cell bodies in the central nervous system are called nuclei, while the cell bodies lining the nerves in the peripheral nervous system are called ganglia.

There are 31 pairs of cranial nerves. _____ F _____

there are 12 cranial nerves that emerge directly from the brain, and 31 of spinal nerves along the spinal cord

The parasympathetic system utilizes the stored energy for emergency and counteracts acute
challenges affecting the body. _____ F _____

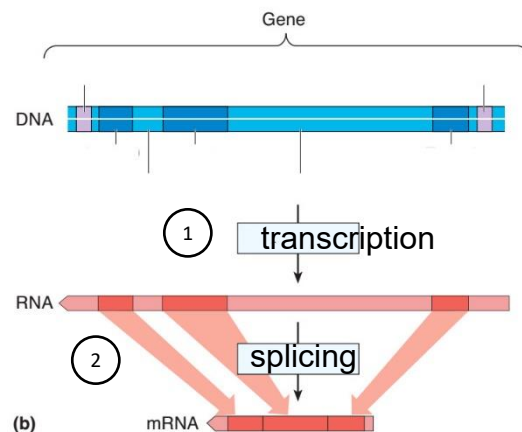
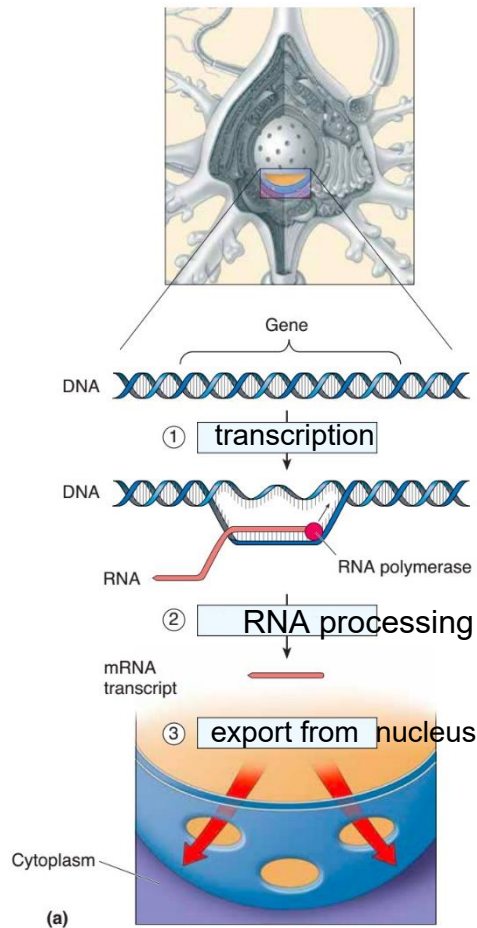
A szimpatikus idegrendszer az, ami elsősorban a stresszhelyzetben kialakuló stresszválaszért felel, vész helyzetben az egész rendszer egységes egészként aktiválódik.

Cells respond to an increased workload by hypertrophy. _____ T _____

Hypertrophy is an increase in the size of cells (or tissues) in response to various stimuli.
A typical example is muscular hypertrophy in response to
(szerintem ez egyébként mind true mind false-ként is elfogadható, de T-t mondott Kalló.)



Identify the cellular events numbered (1-3 in the figure) – and describe the major sections of a gene coloured differently (1-4 in the text box) (7 points)



1. promoter
2. exon
3. intron
4. terminator /TATA

Decide whether the statements are true (T) or false (F). Explain your answer in both cases. (5 points)

The spinal cord is built up by segments even if the borders of these segments are not visible on the spinal cord itself. T

the segments are different (dunno????)

The brain is also an endocrine organ, since it produces a multitude of hormones. T

e.g. hypothalamus secretes hormones which regulates the pituitary

The upper motoneurons innervate the upper limbs, the lower motoneurons innervate the lower limbs, respectively. F

the upper motoneurons are found in the cerebral cortex and brainstem and carry information down to activate interneurons and lower motor neurons, which in turn directly signal muscles to contract or relax. (main source of voluntary movement)