CYTOLOGY. GENERAL CELL ORGANIZATION. PLASMOLEMMA. INTRACELLULAR JUNCTIONS

In histological preparation of nervous tissue you can see, that neurons unite are connected together by means of contacts that are specialized for the one-sided transmission of nervous impulse. Specify, what type of intercellular connection is educed on preparation?

A \*Synapse.

B Desmosome

C Simple

D Tight junctions

E Gap junction

Harmful ecological factors resulted in the sharp falling of endocytosis and exocytosis in the cells of liver and blood. What layer of cytolemma was suffered first of all?

A \*Cortical

B Lipoprotein

C Supra membrane

D Integral

E Glycocalyx

Existence of life at all his levels is determined by the structure of lower level. What level of organization is preceded and provided the existence of life at cellular level:

A \*Molecular

B Tissue

C Organism

D Population

E Biocoenosis

Support of life at any level is related to the phenomenon of reproduction. In what level of organization is reproduction done on the basis of matrix synthesis?

A \* Molecular

B Subcellular

C Cellular

D Tissue

E Levels of organism

A chemical factor had an effect on the cell membrane. As a result a cell has changed its shape. What layer of cell membrane was participated in it?

A \* Cortical

B Glycocalyx

C Two lipids layer

D Hydrophilic

E Hydrophobic

On preparation appears a histological structure that is limited by the membrane which has a volume cytoplasm and plenty of nucleuses. What name this structure has?

A \*Symplast

B Syncytium

C Ground substance

D Cell

E Vacuoles

CYTOLOGY. CYTOPLASMA.

Electron microscopic study of a cell revealed roundish bubbles confined by a membrane and containing a lot of various hydrolytic enzymes. It is known that these organelles provide intracellular digestion and protective functions. These elements are:

A \*Lysosomes

B Centrosomes

C Endoplasmic reticulum

D Ribosomes

E Mitochondria

Nucleoli of nuclei have been damaged due tj tissue culture nuclear irradiation. Regeneration of the following organelles becomes hampered in cytoplasm:

A. \*Ribosomes

B. Lysosomes

C. Endoplasmic reticulum

D. Microtubules

E. Golgi apparatus

A 36-year-old woman had her tooth extracted. The tissue regenerated. Which of the following organelle are the most active during tissue regeneration?

A \*Ribosomes

B Centrioles

C Polysomes

D Smooth endoplasmic reticulum

E Lysosomes

During the histological research was found a great number of granules of glycogen in the cells of liver according to the excessive feeding of animals by carbohydrates. What activity of these organelles indicates this fact?

A \*Trophic inclusion

B Secretory inclusion

C Excretory inclusion

D Pigment inclusion

E Non membrane organelles

Two different organelles that destroy the proteins are visible on the electronic photomicrograph of the cell? What kind of organelles are they?

A \*Lysosome and proteasome

B Endoplasmic reticulum and microfilaments

C Peroxisome and ribosome

D Ribosome

E Golgi apparatus and microtubules

During the cytochemical research a light content of hydrolytic enzymes was found in the cytoplasm of cell. What activity of organelles indicates this fact?

A \*Lysosomes

B Endoplasmic reticulum

C Mitochondrion

D Polysome

E Centosome

During the electronic microscopy in the cytoplasm of cell, near the cell nucleus, was found a membranous organelle that consists of 5-10 flat cisterns, with the extended peripheral areas from which little blisters – (lysosomes) are disconnected. Name this organelle:

A \* Golgi apparatus

B Ribosome

C Mitochondrion

D Cytoskeleton

E Centrosome

On the electronic photo organelle is presented which is a large polyproteasome complex that consists of tube like and two regulator parts, was located on both ends of organelle. The last performs the function of proteolysis. Name this organelle.

A \*Proteasome

B Centriole

C of Inclusions

D Ribosome

E Golgi apparatus

Formation of ribosome subunits in a cell was disturbed in course of an experiment (by means of activated mutagenic factors). This will have an effect on the following metabolic process:

A \*Protein biosynthesis

B Carbohydrate biosynthesis

C ATP synthesis

D Photosynthesis

E Biological oxidation

An animal had been intensively fed with carbohydrates. Histologic examination of its liver revealed a significant number of glycogen granules. Glycogen relates to the following group of cell structures:

A \*Trophic granules

B Secretory granules

C Excretory granules

D Pigment granules

E Special organelles

In process of the secretory cycle secretion granules come and go in the apical part of cytoplasm of pancreas cells. These granules relate to the following structure elements:

A\*Inclusions

B Microfilaments

C Lysosomes

D Exocytic vacuoles

E Granular endoplasmic reticulum

Microscopic analysis of human heart cells revealed some oval oganellas, their tunic being formed by two membranes: the external one is smooth, and the internal one forms crista. Biochemical analysis determined the presence of ATP-synthetase enzyme. What organellas were analysed?

A \*Mitochondrions

B Lysosomes

C Ribosomes

D Endoplasmic reticulum

E Centrosomes

Examination of a patient with hepatolenticular degeneration revealed that synthesis of ceruloplasmin protein has a defect. What organelles is this defect connected with?

A \*Granular endoplasmic reticulum

B Agranular endoplasmic reticulum

C Mitochondrions

D Golgi complex

E Lysosomes

A patient was prescribed a drug with apparent lipophilic properties. What is the main mechanism of its absorption?

A \*Passive diffusion

B Filtration

C Active transport

D Pinocytosis

E Binding with transport proteins

In a muscular tissue there is an intensive aerobic process of accumulation of energy as macro energetic connections ATP. This process takes place due to the participation of such organelles as:

A \*Mitochondrion

B Smooth endoplasmic reticulum

C Lysosomes

D Rough Endoplasmic Reticulum

E Centrosome

Submicroscopic not membranous organelles of general-purpose – microtubules are built from the following protein like:

A \*Tubulin

B Desmine

C Keratin

D Vimentine

E Actinin

Centrioles in their basis contained microtubules which are oriented parallel and have such a formula as:

A \* (9 х 3) + 0

B (9 х 2) + 2

C (9 х 3) + 2

D (9 х 2) + 0

E (9 х 3) + 3

On an electronic photomicrograph is visible the fibroblast that products the components of intercellular substance. Define organelles that take part in this process?

A \* Rough Endoplasmic Reticulum and Golgi complex

B Smooth endoplasmic reticulum and Golgi complex

C Golgi complex and mitochondrion

D Golgi complex and lysosomes

E the Granular and smooth endoplasmic reticulum

Ultramicroscopic examination of “dark” hepatocytes population in the cell cytoplasm detected a developed granular endoplasmic reticulum. What function has this organelle in these cells?

A \*Synthesis of protein of blood plasma

B Synthesis of carbohydrates

C Detoxification

D Products of bile

E Depositing ions of calcium

From the cell was excluded Golgi complex by means of micromanipulator. How it will affect in later existence of cell?

A \*Will be broken formation of lysosomes, maturation of secretory products of cell

B Will be broken by the process of mitosis

C Will be broken by the formation of ribosomes and synthesis of proteins

D Will develop autolysis, can lead cell to death

E Will be broken by processes of power exchange

CYTOLOGY. NUCLEUS. CELL CICLE.

An electronic microphotography represents a cell without nucleoli and nuclear membrane. Chromosomes are loosely scattered, centrioles migrate to the poles. What phase of cell cycle is it&

A. \*Prophase

B. Anaphase

C. Metaphase

D. Telophase

E. Interphase

During the studies of epithelial cells of oral cavity on the surface of cell’s nucleus appear the rounded little bodies that indicated that cells are taken from the oral cavity of woman. How is such a formation of chromatin called?

A \*Barr corpuscles

B Herring corpuscles

C Chromatin

D Euchromatin

D Pacinian corpuscles

During the forensic research of blood sample in neutrophils on the surface of one of segments of cell’s nucleus the chromatin appears as a drumstick. How is such structural formation called?

A \*Barr corpuscles

B Layon corpuscles

C Chromatin

D Euchromatin

E Pacinian corpuscles

In the certain cells of adults during their lifelong there is no mitosis and quantitative content of DNA remains constant. These cells are:

A \* Neurons

B Endothelia cells

C Muscle (smooth)

D Epidermis

E Blood forming

During embryogenesis the epithelial band also known as vestibular plate gives rise to development of vestibule of mouth. What biological mechanism of the programmed death of cells provides growth of buccolabial sulcus from epithelial plate?

A \*Apoptosis

B Necrosis

C Meiosis

D Paranecrosis

E Amitosis

Sometimes it is necessary to do research of somatic cells for determination of sex of human. What their structures can provide the information about sex of human?

A \*Peripheral chromatin

B Euchromatin

C Decondensation chromatin

D Barr corpuscles

E Optional chromatin

It is known that information about sequence of amino acids in a protein molecule is encoded as a sequence of four types of nucleotides in a DNA molecule, and different amino acids are encoded by different number of triplets - from one to six. Such peculiarity of the genetic code is called:

A \*Degeneracy

B Universality

C Nonoverlapping

D Triplety

E Specificity

Analysis of an electron diffraction pattern of a cell revealed mitochondrion destruction. This might result in abnormal course of the following cell process:

A \*Oxidation of organic substances

B Nuclear division

C Crossingover

D Cleavage

E -

An extensive process of accumulation of energy as macroenergic compounds (ATP) is produced in muscular tissue. This process takes place due to the participation of the following organelles:

A\*Mitochondria

B Smooth endoplasmic reticulum

C Lysosomes

D Rough endoplasmic reticulum

E Centrosome

Submicroscopic non membranous organelles of general purpose-microtubules are built from which of the following proteins?

A\*Tubulin

B Desmin

C Keratin

D Vimetin

E Actinin

Centroiles consist of microtubules which have a parallel orientation and have which of the following formulas?

A\*(9 x 3) + 0

B (9 x 2) + 2

C (9 x 3) + 2

D (9 x 2) + 0

E (9 x 3) + 3

Fibroblasts that produce the components of intercellular substance are visible in an electronic microphotograph. Which organ take part in this process?

A\*Rough Endoplasmic Reticulum and Golgi complex

B Smooth Endolasmic Reticulum and Golgi complex

C Golgi process and mitochondrion

D Golgi process and lysosomes

E The Granular and mooth Endoplasmic Reticulum

A developed granular endoplasmic reticulum was detected in an ultramicroscopic examination of the "dark" hepatocytes population. What is the function of these organelle in these cells?

A\*Synthesis of protein of blood plasma

B Synthesis of Cabohydrate

C Detoxification

D Products of bile

E Depositing ions of Calcium

By means of micromanipulator the Golgi complex was removed. How will this affect the later existence of the cell?

A\*Will be broken formation of lysosomes, maturation of secretory products of cell

B Will be broken by the process of mitosis

C Will be broken by the formation of ribosomes and synthesis of proteins

D Will develop autolysis, can lead to cell death

E Will be broken by process of power exchange.

In the post synthetic period of mitosis the cycle of protein synthesis was damaged -the tubulins take part in formation of spindle fibers of division. This can result in the violation of:

A \*Of divergence of chromosomes

B Of duration of mitosis

C Of spiralization of chromosomes

D Of cytokinesis

E Of antispiralization of chromosomes

A \*dumbell shaped cell stained with Ferrous Hematoxylin dye is presented on a histological preparation, spiralization of chromosomes is visible in the poles. Which phase of the cellular cycle is the cell in?

A \*In telophase

B In anaphase

C In metaphase

D In prophase

E In interphase

The mucous membrane of the cheeks is scraped by means of a spatula and a smear is made and stained with methylene blue. Semispherical lumps of heterochromatin are visible in the nucleus of epithelial cells near the internal membrane. What is this structure?

A \*Barr body

B Fordyce spots

C Buccal fat pad

D Y-chromosome

E Ribosom

CYTOLOGY. CELL MEMABRANE.

A large number of cisterns flattened in the center and extended on the periphery and small vesicles with secretory granules were found in the biopsy hepatocytes during the electron microscopic study of the biliary pole. Name this organelle:

A. \*Golgi apparatus

B. Lysosomes

C. Endoplasmic reticulum

D. Pinocytotic vesicles

Е. Microtubules

The organism to be identified has a nucleus surrounded by a nuclear membrane. Genetic material is concentrated predominantly in the chromosomes that consist of DNA strands and protein molecules. These cells divide mitotically. Identify these organisms:

A. \*Eukaryotes

B. Bacteriophages

C. Prokaryotes

D. Viruses

E. Bacteria

An electron micrograph shows a cell-to-cell adhesion consisting, in each cell, of an attachment plaque. The intercellular space is filled with electron-dense substance including transmembrane fibrous structures. Specify this adhesion:

A \*Desmosomes

B Synapse

C Tight junction

D Nexus

E Adherens junction

The action of microbial toxins on the cells caused significant damage of the glycocalyx. What function of the cell membrane will be significantly disordered?

A \*Receptor

B Transport

C Respiratory

D Formation of contact

E Protective

The harmful factors caused the acute disorder of the endocytosis and exocytosis in the liver and blood cells. What layer of the cell membrane was first injured?

A. \*Cortical layer

B. The layer of the lipids end proteins

C. Upper part of membrane

D. Integral

E. Glycocalyx

CYTOLOGY. CYTOPLASM. ORGANELLS. INCLUSIONS.

The secretory granules appear and disappear in the cytoplasm of the pancreatic cells during the secretory cycle. Which structural elements can these granules be related to?

A \*To inclusions

B To microfilaments

C To lysosomes

D To exocytosis vacuoles

E To granular endoplasmic reticulum

Significant reduction of the protein synthesis in hepatocytes resulted by the long-term effects of the toxic substances on the body. What organelles are most affected by intoxication?

A \*Granular endoplasmic reticulum

B Mitochondria

C Microtubules

D Lysosomes

E Golgi apparatus

In the tissue culture the nucleoluses were damaged by the radioactive irradiation. Recovery of what organelles in the cytoplasm becomes problematic?

A \*Ribosomes

B Lysosomes

C Endoplasmic reticulum

D Microtubule

E Golgi apparatus

The structure of the ribosome was disordered in the cell. What process is primarily affected?

A \*Protein synthesis (translation)

B Protein synthesis (transcription)

C Synthesis of carbohydrates

D Synthesis of lipids

E Synthesis of minerals

The researchers destroyed the structure of one of the cell parts during a scientific experiment. As a result the cell lost the ability to division. What structure was broken?

A \*Centrosome

B Glycocalyx

C Plastic complex

D Microfibrille

E Mitochondria

The patient was hospitalized in the hospital with poisoning. It was established that the detoxification processes were disordered in the liver. Which organelles of hepatocytes were injured?

A \*Agranular endoplasmic reticulum

B Mitochondria

C Granular endoplasmic reticulum

D Golgi apparatus

E Ribosomes

The organelles, which consist of cisterns that flattened in the center and extended on the periphery and small vesicles, were found at the electron microphotography of the nervous cells. What are these organelles?

A \*Golgi apparatus

B Centrioles

C Lysosomes

D Peroxisomes

E Mitochondria

The abnormal biopolymers were found in the body cells of the child (7 years) with congenital "storage diseases". Name this organelle.

A \*Lysosomes

B Ribosomes

C Granular endoplasmic reticulum

D Mitochondria

E Peroxisomes

A high content of hydrolytic enzymes in the cytoplasm was founded during the examination. Which organelle activity shows this fact?

A \*Lysosomes

B Mitochondria

C Polysomes

D Endoplasmic reticulum

E Centrioles

The organelle that is the big polyprotease complex and consists of tubular and two regulatory parts that are located at both ends of organelle was representing on electronic photo. The function of this organelle is proteolysis. Name this organelle.

A \*Proteasome

B Centrioles

C Inclusion

D Ribosome

E Golgi complex

The vesicles with peroxide oxidation enzymes - catalase, peroxidase (0,05-1,5 microns in diameter) were revealed in the cytoplasm of hepatocytes during the histochemical investigation. What are these organelles?

A \* Peroxisomes

B Lysosomes

C Melanosomes

D Liposomes

E Phagosomes

Low level of albumins and fibrinogen was detected in the patient's blood. What organelle decreased activity of the liver hepatocytes can cause it?

A \*Rough endoplasmic reticulum

B Smooth endoplasmic reticulum

C Mitochondria

D Golgi complex

E Lysosomes

At what component of the cell the lysosomes formation takes place?

A. \*At the Golgi apparatus

B. At the nucleus

C. At the ribosomes

D. At the mitochondria

E. At the organizing cell center

The microtubules contain the protein:

A. \*Tubulin

B. Desmin

C. Dynein

D. Calmodulin

E. Vimentin

An organelle that participates in glucosylation of proteins and lipids with the formation of glycosaminoglycans was detected in the histological preparation of the spinal ganglion in the pseudounipolar neurons after impregnation with silver salts. Name this organelle.

A \*Golgi apparatus

B Mitochondria

C Rough endoplasmic reticulum

D Smooth endoplasmic reticulum

E Centrioles

Labeled aminoacids, alanine and tryptophane were introduced to a mouse in order to study localization of protein biosynthesis in its cells. Around what organelles will the accumulation of labeled amino acids be observed?

A \*Ribosomes

B Agranular endoplasmic reticulum

C Cell center

D Lysosomes

E Golgi apparatus

Ultramicroscopic examination of «dark» hepatocytes population in the cell cytoplasm detected a developed granular endoplasmic reticulum. What function has this organelle in these cells?

A \*Synthesis of blood plasma proteins

B Carbohydrate synthesis

C Detoxification

D Bile production

E Calcium ion depositing

The hysterectomy was made to a 67-year-old woman because of a tumor. At the histological investigation of this tumor the multipolar mitoses were found at the tumor cells (chromosome migration to more than two cellular poles). Which organelles disorder can this multipolar mitosis cause?

A \*Centrioles

B Secondary lysosomes

C Smooth endoplasmic reticulum

D Rough endoplasmic reticulum

E Peroxisomes

The cell was treated by a substance, which blocks the nucleotide phosphorylation process in the mitochondria. What process will be broken?

A. \*ATP resynthesize

B. Synthesis of mitochondrial proteins

C. Oxidative phosphorylation

D. Integration of functional protein molecules

E. Fragmentation of large mitochondria smaller

The cell of the laboratory animal was overdosed with Roentgen rays. As a result albuminous fragments formed in the cytoplasm. What cell organelle will take part at their utilization?

A \*Lysosomes

B Endoplasmic reticulum

C Cells center

D Golgi complex

E Ribosome

CYTOLOGY. NUCLEUS. CELL CICLE.

The histone proteins synthesis was artificially blocked in the cell. What cell structure will be damaged?

A \*Nuclear chromatin

B Nucleolus

C Golgi apparatus

D Cell membrane

E Nuclear envelope

The cell without the nucleus and nucleolus is presented at the electron microphotography. The chromosomes are free; the centrioles migrate to the poles. In which phase of the cell cycle is the cell?

A \*In prophase

B In anaphase

C In metaphase

D In telophase

E In interphase

The culture of the tumor cells was affected by colchicine, which inhibits formation of the proteins-tubulins that are necessary for the spindle apparatus formation. What stage of the cell cycle will be affected?

A \*Mitosis

B Presynthetic period

C Synthetic period

D Postsynthetic period

E G0 - phase

Human somatic cells in the metaphase were found in the histological preparation. How many chromosomes the metaphase plate consists of in case if each chromosome has two sister chromatids?

A \*46 chromosomes

B 92 chromosomes

C 23 chromosomes

D 48 chromosomes

E 24 chromosomes

The cells whose nuclei contain sex chromatin (Barr body) were found in the amniotic fluid during the investigation that obtained by amniocentesis (amniotic membrane puncture). What could it mean?

A \*Development of the female sex fetus

B Development of the male sex fetus

C Genetic abnormalities in fetal development

D Trisomy

E Рolyploidy

It is known that the syntheses of the proteins-tubulins are blockaded under the colchicine action.

What stage of the cell cycle will be disordered in this case?

A. \*Postsynthetic (premitotic) period of the interphase

B. Prophase of mitosis

C. Synthetic period of the interphase

D. Formation of the metaphase plate

E. Presynthetic (postmitotic) period of the interphase

A very low content of heterochromatin was found at the hepatocyte nuclei during microscopic study. What functional state of the cell does it mean?

A \*Increase of protein synthesis

B Apoptosis

C Necrosis

D Reduction of protein synthesis

E Entry into mitosis

Compaction of the nucleus was observed on the electron microphotography of the cells taken from animals after a chemical exposure. What is the state of the nucleus in the cell?

A \*Karyopyknosis

B Mitosis

C Amitosis

D Polyploidy

E Meiosis

At the electronic microphotography the nucleus is surrounded by the thin lamina of biological membrane. How does it called?

A \* Nuclear envelope

B Plasmolemma

C Cytolemma

D Nuclear pore

E Pore complex

The navy-blue chromatin granules were found at the nucleus on the slide that is stained by hematoxylin and eosin. What is the stage of the cell cycle?

A \* Interphase

B Prophase

C Metaphase

D Anaphase

E Telophase

A few cells of the oral cavity epithelium were taken for the examination. Sex chromatin (Barr body) was found in the nuclei of epithelial cells after special processing of the histological specimen. Which chromosome forms a sex chromatin?

A \*Х – female condensed chromosome

B Х – female dispersed chromosome

C Х – male condensed chromosome

D Х – male dispersed chromosome

E Y – condensed chromosome

While studying maximally spiraled chromosomes of human karyotype the process of cell division was stopped in the following phase:

A \*Metaphase

B Prophase

C Interphase

D Anaphase

E Telophase

Moving of the daughter chromatids to the poles of the cell is observed in the mitotically dividing cell. On what stage of the mitotic cycle is this cell?

A \*Anaphase

B Metaphase

C Telophase

D Prophase

E Interphase

The study of mitotic cycle phases of the onion root revealed the cell, in which the chromosomes are situated in the equatorial plane, forming a star. What stage of the cell mitosis is it?

A \*Metaphase

B Anaphase

C Telophase

D Interphase

E Prophase

The syntheses of proteins - tubulines, which take part in the mitosis formation, were destroyed during the postsynthetic period of mitotic cycle. It can cause the impairment of:

A \*Chromosome separation

B Cytokinesis

C Duration of mitosis

D Chromosome despiralization

E Chromosome spiralization

There are three periods of the cell cycle interphase. What process takes the place during the S-period?

A \*Replication of the DNA

B Meiosis

C Cytokinesis

D Mitosis

E Аmitosis

Cells in the tissue culture were affected by colchicine, a substance that inhibits the contraction of microtubules of the spindle apparatus, with the aim of obtaining a human karyotype. At which stage will mitosis be stopped?

A \*Metaphase

B Telophase

C Interphase

D Anaphase

E Prophase

It is known that apoptosis is programmed cell death that occurs in human during the whole ontogenesis. Which of the following features are typical for apoptosis?

A \* Activation of genes whose products kill the cells are taking place during apoptosis.

B Condensation of the nucleus and the cytoplasm

C The cell which dies often breaks up into fragments.

D Genes which primarily breaking down DNA into large and then into smaller fragments are

activated during apoptosis

E Apoptosis often occurs in the embryonic period.

A common physiological phenomenon which is programmed and genetically controlled process that is induced by killer genes is observed during embryogenesis. In this case there are condensation of the nucleus, condensation of chromatin and disintegration of the nucleus into the “micronuclei”, condensation of the cytoplasm and its fragmentation. The cell splits into bodies containing the “micronuclei” that are phagocytized by macrophages. What phenomenon is this?

A \*Apoptosis

B Pyknosis

C Necrosis

D Endomitosis

E Endoreproduction

A tumor of the pyloric part of the stomach was diagnosed in the patient. What proteins are able to inhibit the mitotic division of newly formed cells?

A. \*Keylons

B. Ribonuclease

C. Lysozyme

D. Hemoglobin

E. Myoglobin

The scraping from the mucous membrane of the cheeks was taken. A smear was made and stained with methylene blue. Hemispherical clumps of heterochromatin near the inner membrane of the epithelial cells nuclei are visible under a microscope. What structure is this?

A \*Barr body

B Fordyce spots

C Bisha adipose body

D У-chromosome

E Ribosomes