

## INFORMATIONAL TEXT STRUCTURES BY CONTENTS OF THE SPECIALISED TEXT

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Text is defined in text linguistics as a communicative occurrence which should necessarily meet the criteria of textuality. Theoretical knowledge in medicine is presented in a particular type of texts that convey generally valid information about rules, principles and instructions, that is, in descriptive texts.

Interpretation of the scientific information and comprehension of language use through logical assumptions and restrictions allows the detection, identification, systematization and description of the informational text centres as well as structuring of the texts using logical semantic schemes.

According to the text content we can differentiate different types of informational structures that are anchored on specific logicosemantic relations and apparently belong to the field of the respective subject.

• **Text-argument** - Specific relationships between certain physical parameters can be described in an equation:

- *components (parameters)* - electrical resistance  $R$ , voltage  $U$ , electric current  $I$ .
- *characteristic (relationship, law)* - The ratio of the voltage  $U$  between two points of a conductor and the current  $I$  flowing through it equals the resistance  $R$  of the conductor (Ohm's law):

$$R = \frac{U}{I}$$

- *corollary* -  $I$  increases proportionally to the increase of  $U$ .
- **text-process** - A specific reaction between chemical molecules with characteristic features results in a chemical reaction with a particular effect:
  - *components (molecules)* - *hydrogen and chlorine*.
  - *characteristic (reaction, process)* One hydrogen ion (positive) binds to one chlorine ion (negative).
 
$$\text{H}^+ + \text{Cl}^- \rightarrow \text{HCl}$$
  - *corollary* - formation of hydrochloric acid
- **text-function** - The function of structural biologic elements with specific characteristics - structure, composition, localisation, links - is specifically manifested in micro and macro level:
  - *components (structural elements)* - antinuclear antibodies (ANA)

- *characteristic* - molecules against self nuclear antigens
- *corollary* - response of the body against self structures - disease
- **text-icon** - Description (image) of anatomic structures: sites, characteristic, relationships and functions of these anatomic structures.
  - *components (anatomic structures)* - the cerebral cortex.
  - *characteristic* - the outermost layer of the brain consisting of differently shaped neurons arranged in 6 layers and defining about 200 fields.
  - *function / corollary* - a centre of the various vital functions.
- **text-regulation** - interaction of biologic structures with specific characteristics and function designed to achieve (physiologic) regulation.
  - *components (biologic active substances)* - glucose, insulin.
  - *characteristic* - normal glucose concentration in blood plasma is  $2.7 \div 5.6$  mmol/l. Its increase activates the glucose receptors and the hormone *insulin* is released.
  - *corollary* - the high plasma concentration of glucose drops down to normal levels.

### EXERCISES:

1. DETERMINE AND GIVE THE INFORMATIONAL STRUCTURAL COMPONENTS OF THE FOLLOWING TEXTS ACCORDING TO THEIR CONTENT: (THE EXPECTED ANSWER IS GIVEN IN ITALICS)
  - 1.1. **Infrasound has a very long wavelength** and as a result is poorly absorbed (a 10 Hz sound is absorbed 10 times as weakly as a 1000 Hz sound), **has strong diffraction** (getting around obstacles), and can **resonate with body tissues** causing physiologic dysbalance.

*Parameter: infrasound*

*Characteristic: great wavelength - weak absorption, great diffraction, resonates with body tissues*

*Corollary: harmful to people*

### 1.2. Photoisomerization

The eye retina has photoreceptor cells (rods and cones) which help in the conversion of light into an electrical impulse. The transformation occurs as a result of a photochemical reaction that occurs in the visual pigment *rhodopsin* whose chromophoric group retinal is photoisomerized (under the influence of the photon). The *retinal* is transformed from *cis*-retinal into *all-trans*-retinal. The induced conformational changes in the rhodopsin alter the normal permeability of the cellular membrane of the receptor cells for  $\text{Na}^+$ . The polarity of the membrane is changed (reversed) which generates receptor potential.

**Chemical molecules:** *the macromolecule of rhodopsin consisting of a protein component opsin and a chromophoric group retinal.*

**Process:** *photoisomeric - under the impact of a light quantum the retinal is transformed from cis-retinal into all-trans-retinal. The trans-form of the retinal leads to conformational changes in the protein component of rhodopsin. The changes in the form of this transmembrane protein cause a change in the ion transport through the membrane of the receptor cell, reversal of the polarity and induction of electric potential.*

**Corollary:** *capacity to see.*

- 1.3. Like all other cells, **the cancer cell has a cell membrane** that is composed of a permeable lipid bilayer and proteins. A tumour cell may become resistant to cytostatic drugs through the occurrence of a transmembrane transport protein, P-glycoprotein (molecular mass of 170000 D; it passes 12 times through the membrane). The P-glycoprotein acts as a channel for cytostatic drugs which enter the cell through it and as an efflux pump which removes the cytostatics. Cancer cells are resistant to chemotherapy - the P-glycoprotein pumps the cytostatic drugs out of the cell, which renders it incapable of holding the drugs in and they fail to destroy it.

**Components:** *P-glycoprotein*

**Characteristic:** *a transmembrane glycoprotein with molecular mass of 170000 D acting as a channel and a pump for the cytostatics in the cellular membrane of the cancer cell*

**Corollary:** *resistance of the cancer cells to chemotherapy*

- 1.5. **The hypothalamus** is part of the diencephalon. It consists of 32 paired nucleus connected with almost all regions of the central nervous system. The hypothalamus controls the vegetative and homeostatic processes in the body, the behaviour and emotions of man; realises the connection between the nervous and endocrine system. Its cells secrete hormones that regulate the activity of the hypophysis, water exchange, the tone of the uterus muscles.

**Components (basis):** *hypothalamus*

**Characteristic:** *part of the diencephalon connected with almost all regions of the central nervous system.*

**Corollary:** *it realizes the link between the nervous and endocrine system, controls the vegetative and homeostatic processes in the body.*

- 1.6. **Subdural haemorrhage** occurs usually as a result of a cerebral vein rupture at its entrance into the superior sagittal sinus and leads to subdural hematoma (collection of blood). Normally, dura matter and arachnoidea are glued together in one single structure but as a result of a trauma blood may collect between them as the brain suddenly shifts and is injured in the skull. The increase of the amount of blood causes compression of the brain.

**Components (basis):** *subdural hematoma*

**Characteristic:** *blood collection between the dura matter and the arachnoidea.*

**Corollary:** *brain compression*

## 2. COMPOSE A TEXT FROM THE FOLLOWING INFORMATIONAL TEXT STRUCTURES

- 2.1. **Components:** humoral regulators

**Characteristic:** biologically active substances; **types:** mediators, growth factors; **function:** part of the common humoral regulation by connection to specific receptors, change of the function of the target cells

**Corollary:** regulation of homeostasis, growth, development, reproduction, activity of the central vegetative system and vegetative nervous system, behaviour.

- 2.2. **Components:** pancreas

**Characteristic:** a digestive gland with internal and external secretion; **function:** regulation of substances metabolism (its internal secretory part secretes *glucagon* and *insulin*); **interaction** between the secretion of insulin and the glucose level in blood (in failure or suppressed secretion of insulin the level of glucose in blood increases - hyperglycemia)

**Possible corollary:** diabetes mellitus

- 2.3. **Blood group antigens**

**Components:** blood group antigens A, B, AB, and O

**Characteristic:** glycoproteins and glycosphingolipids, localised in the membrane of erythrocytes, cells and tissues, determining the presence of four blood groups.

**Corollary:** determination of blood-group antigens in blood transfusion, transplantations, in forensic medicine and anthropology.

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