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ЗМІСТ/CONTENTS

Сторінки/Pages

«КВІТНЕВА НАУКОВА СЕСІЯ 2023»
«APRIL SCIENTIFIC SESSION 2023»
17 квітня 2023 Київ, Україна
April 17, 2023 Kyiv, Ukraine

«ТКАНИННІ РЕАКЦІЇ В НОРМІ, ЕКСПЕРИМЕНТІ ТА КЛІНІЦІ»
Всеукраїнська науково-практична конференція з міжнародною участю
присвячена пам'яті члена-кореспондента НАМН України,
д.мед.н., професора Ю. Б. Чайковського
Київ, 8–9 червня 2023

«TISSUE REACTIONS IN THE NORM, EXPERIMENT AND CLINIC»
All-Ukrainian scientific and practical conference with international participation dedicated
to the memory of professor Yu. B. Chaikovsky
Kyiv, June 8–9, 2023

THE OPTIMIZING OF TEACHING APPROACHES OF MORPHOLOGICAL DISCIPLINES / ПІДХОДИ ОПТИМІЗАЦІЇ ВИКЛАДАННЯ МОРФОЛОГІЧНИХ ДИСЦИПЛІН

MODERN STATE OF MORPHOLOGY

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Modern interest in morphology as a system of sciences is intensively increasing in connection with a number of recent discoveries in the field of the homeostatic role of immunity as a universal property of all living organisms. One of the main ones is the discovery of patterns as functionally significant, stable monomer sequences in pathogen biopolymers (PAM) and pathogen receptor systems (PRR) (Janeway C. A., Joy R. 1989, Medzhitov, 2009). Predominantly located on the cells of innate immunity, their interaction with patterns integrated these cells into the general immune response system in place with adaptive T- and B-lymphocytic immunity. A revolutionary event in immunology was the formulation of the «Danger Theory» concept (P. Matzinger, 2002), according to which the immune system does not respond to infections or oncogenesis, but to signals of structural homeostasis disturbances emanating from the body cells themselves. These signals were called DAP, one of which is rightly considered to be extracellular HSPs. Further studies of the reactivity of innate and adaptive immunity cells revealed a high structural heterophilicity of DAP and AG, to which T- and B-lymphocytes respond, which gave reason to believe that ICC processes are the same response to changes in structural homeostasis in tissues.

In addition, numerous studies confirm that normally all the resulting clones of T- and B-lymphocytes are moderately autosensitized without a cytotoxic effect, performing morphogenetic functions (Poletaev A. B., etc.). In a system of experiments on the adoptive transfer of T- and B-lymphocytes or total RNA from them from operated donors to intact recipients, stimulated reparative reactions in them similarly to those in donors (Babaeva A. G.). In the experiment of chronic social stress through the neuroendocrine system, it inhibited the functional participation of mast cells in the healing of surgical wounds, which was accompanied by a chronicization of inflammatory and reparative processes. Development of an immunogenesis direction for analyzing the state of immunity by the number of activated circulating lymphocytes bearing residual signs of a certain stage of immunogenesis (Frolov O. K., et al. 2005). In this direction, the following methods have been developed: cytogenetic – based on the location of nucleoli-forming chromosomes, cytomorphometric – based on the size of lymphocytes and other immunocompetent cells (ICC); by density on the cytolemma of CD – structures; luminescent – according to the ratio of single- and double-stranded nucleic acids.

Thanks to the listed discoveries, we have developed a concept regarding the primacy of the morphogenetic function of the immune system for the control and regulation of all histogenesis according to the genotype of the organism at certain stages of onogenesis and specific environmental conditions, the contradictions of the anti-infectious and anti-oncogenic functions of the immune system, which are resolved together with the first. According to this concept, the mechanisms of various phenomena of reactivity of the immune system have been studied and characterized, which confirm the theory regarding the primacy of the morphogenetic function of immunity.

1. Infectious and vaccinal processes are accompanied by a significant (5-15-20%) increase in activated lymphocytes, exceeding the level of their reactivity to AG of infections.
2. In the process of ontogenesis in the peripheral blood, high levels of activated lymphocytes are recorded – 20-30-40% – adequate to its periods to control structural homeostasis.
3. Study of the mechanism of the widespread spectrum of therapeutic action of BAS of medicinal leech, namely:
   - 3.1. Correction of the helper-suppressor balance of innate and adaptive immunity, which includes inhibition of excess activity of T-helpers and adequate stimulation of the T-suppressor unit of lymphocytes.
   - 3.2. In the in vivo and in vitro system, the mechanism of apoptosis induction of ICC as a mechanism of anti-inflammatory action was studied. Purpose – correction of inflammation, development of oncogenesis.
   - 3.3. In the system «medicinal leech – blood of mammals» the phenomenon of xenotransplantation immunity in medicinal leech and its disruption in the form of the phenomenon of «transplant versus host reaction» was studied. The purpose is to regulate transplantation immunity.
   - 3.4. In hirudotherapy, a powerful morphogenetic effect mediated through the stimulation of the organs of the immune system was studied, which manifested itself through an increase in the body's resistance to adverse environmental conditions, reparative ability, and in the form of a gerontological effect.

These achievements can be applied in preventive and curative medicine and veterinary medicine.