

disease and would be considered for patients with moderate or severe symptoms that are not controlled by environmental control measures and/or medications.

**Aim.** The aim of this review is to provide an overview of the current knowledge on the mechanisms and new methods of allergen immunotherapy based on the recent publications.

**Materials and methods.** Data analysis of literature and Internet sources.

**Results and discussion.** A direct action on the cause of the allergy is based on the same principle as vaccination. It consists of gradually and regularly administering the allergen causing the symptoms to patients in order to induce tolerance to the allergen. Studies of the mechanisms of action of ASIT, carried out in recent years, have shown the important role of regulatory T cells (Treg) in the suppression of the allergic response. Tregs are represented by two main subtypes: the constant subtype of CD4<sup>+</sup>CD25<sup>+</sup> cells and the inducible Treg1 subtype. The constant subtype is characterized by the expression of the transcription factor FoxP3, which is induced by the secretion of IL-10 and tumor growth factor- $\beta$  (ORF- $\beta$ ). Tregs control the allergic response through certain mechanisms, including T-cell tolerance, when T cells do not respond to antigen or self-organ and tissue determinants. T-cell tolerance can be directly caused by the action of IL-10 and ORF- $\beta$ . IL-10, a suppressor of IgE production, both general and allergen-specific, leads to an increase in IgG4 synthesis, while ORF- $\beta$  promotes an increase in IgA production. The main method of ASIT is the classical parenteral method, which consists in the subcutaneous administration of increasing doses of the allergen according to the schemes specially developed depending on the type of allergen injected. The following non-injection ASIT methods are currently described: oral; sublingual; intranasal; endobronchial.

**Conclusions.** Thus, ASIT is the only type of therapy for allergic diseases that affects the main pathogenetic mechanisms of their development and induces changes in the immune system that have a positive effect on the long-term prognosis of allergic diseases.

## **INFLUENCE OF CETRARIA ISLANDICA ON BEHAVIORAL ACTIVITY OF RATS ON THE BACKGROUND OF EXPERIMENTAL HYPOTHYROIDISM**

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**Introduction.** Recently, the problems of thyroidology are becoming especially relevant. Pathologies of the thyroid gland occupy one of the main places among endocrine diseases and takes 47.3%. Dysfunction of the thyroid gland leads to severe pathological disorders of other organs and systems of the human body. The most common complications of thyroid pathology are diseases of the cardiovascular and nervous systems. One of the most common thyroid dysfunctions is hypothyroidism, which leads to disorders of higher nervous activity, accompanied by a decrease in spontaneous behavioral activity and decreased cognitive abilities.

**The aim** of this study was to determine the effect of aqueous extract from *Cetraria islandica* on the spontaneous behavioral activity of rats on the background of merkazolilum-induced hypothyroidism.

**Materials and methods.** Experimental hypothyroidism was induced by daily administration of an aqueous solution of merkazolilum (500 mg in 1 l) instead of drinking water for 30 days. Experimental animals were randomly divided into 3 groups: 1– intact control; 2 – rats treated with the thyrostatic merkazolilum (control pathology); 3 – hypothyroid rats treated with aqueous extract

from *Cetraria islandica* (experimental). Aqueous extract from *Cetraria islandica* at a dose of 1.0 ml / 100 g body weight was administered orally 1 hour before the experiment. Animals of the intact group (IC) and the group of control pathology (CP) were injected with an appropriate volume of saline. The parameter of approximate research activity of rats in the test "open field" is characterized by a number of values: the number of crossed squares (horizontal motor activity), vertical racks (vertical motor activity), examined holes – "hole" (approximate research activity), grooming duration and number bolus of defecation (emotional activity) according to the conventional method. The rat was placed in the center of the field and observed for 3 minutes.

**Results.** The analysis of the obtained data showed that the number of crossed squares in the group of hypothyroid animals (CP) was 5.7 times less than in intact control (IC). The number of visits to the "hole" decreased by 3.4 times, the vertical racks decreased by 5.9 times, indicators of emotional activity decreased by 2 times, which indicates the suppression of motor and research activity of animals and confirm the adequacy of the applied experimental model of hypothyroidism.

Introduction of aqueous extract from *Cetraria islandica* led to increased number of crossed squares by 2.4 times, the number of visits to the "hole" increased by 2.1 times, the number of vertical racks increased by 1.2 times compared to control animals. Obtained results indicated a positive effect of the studied extract on the locomotor activity of rats. At the same time, the indicators of emotional activity were at the level of the CP group, which indicates the suppression of emotional lability.

**Conclusions.** In the course of the study, the psychostimulant activity of the aqueous extract from *Cetraria islandica* against the background of experimental hypothyroidism induced by merkazolilum was studied. A study of the behavioral responses of animals using the "open field" test showed a positive effect on the locomotor and research activity of rats. The use of the studied extract did not affect the emotional activity of rats in comparison with animals with untreated hypothyroidism.

## MECHANISMS OF ANOSMY IN COVID-19 AND CONSEQUENCES

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**Introduction.** Anosmia is a term used in medicine to define complete loss of sense of smell, partial loss is called hyposmia. There are many causes of anosmia, among which are damage to the nasal cavity, olfactory receptors, or pathways for the transmission of odors in the brain. Loss of smell may be related to allergy (seasonal allergic rhinitis) or nasal polyps. Damage to the olfactory receptors can be caused by chronic sinusitis, viral infections of the upper respiratory tract, toxins, drugs (amphetamines, enalapril, reserpine, etc.) and tumors (rarely). Even long-term use of nasal vasoconstrictors can cause destruction of the olfactory receptors and, as a result, anosmia. Damage to the olfactory pathways in the brain is varied: head trauma, brain tumors, Alzheimer's disease, degenerative neurological disorders (multiple sclerosis), brain infections, and neurosurgical interventions.

More than a year ago reports of an outbreak of acute respiratory infection in China occurred. The causative agent of this infection was the new coronavirus SARS-CoV-2, and the disease was named the coronavirus infection COVID-19. According to currently available data, approximately