медицини. Це пов'язано з невирішеними питаннями контролю запалення, оптимізації процесів загоєння тканин, попередженням розвитку хронічного запалення.

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THE AUTONOMIC NERVOUS SYSTEM ITS INFLUENCE OF SALIVA MICROCRYSTALLISATION DURING ADAPTATION TO PHYSICAL EXERCISE

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Nowadays, considerable effort has been devoted to developing a new generation of saliva analysis strategies, owing to the ease of collection, its non-invasive properties and economic efficiency in biomedical research, personalised medicine and health monitoring, for assessing levels of various disease biomarkers, medication research and

studying pharmacokinetic effects and preventing future diseases. Non-stimulated mixed oral fluid (saliva) is a valuable material for understanding physiological and pathophysiological processes, as biochemicals from the blood are transferred into saliva through ultrafiltration and diffusion, reflecting the body's condition, the effects of physical exertion and systemic health. By breaking saliva down into its constituent components in the early 2000s, the term «salivomics» emerged, reflecting the rapid, comprehensive adoption of saliva research and encompassing: proteomics (proteins), genomics (DNA), metabolomics (metabolite profiles), immunomics (immune components), microbiomics (microbial populations) and transcriptomics (RNA) [2].

Sports medicine research has found that saliva is the optimal fluid for monitoring athletic performance, assessing the stress response to physical activity, and developing strategies for restoring the body's physiological reserves, immune activation and oxidative stress, respectively. Physical activity, in both cyclic and non-cyclic sports, affects key characteristics of saliva, such as consistency, flow rate, pH, buffer capacity, and the concentration of organic and electrolyte components [5].

The autonomic nervous system regulates the composition and quantity of saliva. The sympathetic nervous system is activated during physical exertion, leading to changes in salivation: the secretion of small volumes of saliva, alterations in protein composition, and the reabsorption and secretion of electrolytes in secretory cells, thereby modifying the ionic concentration of saliva. Na^+, Ca^{2+}, Cl^-, HCO_3^- and proteins (S-type cystatins, cystatin C, α-amylase, lysozyme, MUC5B, etc.) increase as a result of physical exertion, whilst the concentration of K^+ changes slightly. Cortisol in saliva and blood serum increases linearly with the intensity of physical exercise. The activity of the parasympathetic branch of the ANS dominates at rest. During exercise in healthy adults, a significant reduction in parasympathetic tone and a marked increase in sympathetic nervous system activation are observed both during and for up to an hour after exercise. Recovery from physical exertion is accompanied by a progressive increase of parasympathetic activity, whilst sympathetic activity decreases to the baseline level of the resting state [3; 5].

Lactate can be used to indicate training effectiveness and intensity, as it accumulates during anaerobic respiration when the rate of lactate production exceeds the rate of removal. The exercise-induced increase in salivary lactate is reproducible and independent of a reduction in salivary flow rate following exercise, and correlates closely with plasma levels. 3-methylhistidine and taurine indicate physiological stress on skeletal muscles and muscle catabolism (taurine has a direct correlation with the distance covered). Metabolites associated with performance following standardised training sessions involving increased energy consumption include creatine, inositol, glucose, citrate and lactate [4].

The influence of the autonomic nervous system, against a background of chronic (prolonged) stress, is due to the functional dominance of the sympathetic nervous system over the parasympathetic nervous system and changes in the electrolyte characteristics of saliva; as a result, the microcrystallisation potential of saliva is affected, which triggers microcrystallisation and structure-forming changes in crystalline aggregates. Chronically stressful factors cause a shift in the ratio of electrolyte and fractional components, resulting in changes to the microcrystal architecture and the pattern of the test sample [1].

In the context of varying functional activity of the autonomic nervous system and its components (the sympathetic and parasympathetic nervous systems) during physical exertion, changes in microcrystallisation structure, under the influence of activation of the sympathetic or parasympathetic nervous system, opens up new prospects for fundamental and application-oriented scientific research, creating a basis for understanding saliva microcrystallisation as one of the markers determining the degree of physiological changes influenced by physical exercise of varying intensity. This area of scientific research is shaping a new direction in the clinical and functional diagnosis of various physiological states and pathophysiological processes.

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АНАЛІЗ ПОКАЗНИКІВ ФУНКЦІОНАЛЬНОГО СТАНУ ОРГАНІЗМУ ОСІБ ЮНАЦЬКОГО ВІКУ

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Відповідно до сучасної концепції, функціональний стан організму розглядають як рівень ефективності роботи основних фізіологічних систем, що забезпечують життєдіяльність організму, його працездатність і адаптаційний потенціал**.** Оцінка функціонального стану дозволяє визначити рівень соматичного здоров'я людини, а також виявити ранні ознаки відхилень. За літературними даними, третина дітей ще в молодших класах має ознаки захворювань опорно-рухової і дихальної систем, у чверті школярів діагностують хвороби органів системи травлення, в багатьох дітей є хвороби серцево-судинної системи, хвороби очей. В процесі навчання у кілька разів зростає кількість учнів з