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THE ROLE OF DNA METHYLATION IN THE DEVELOPMENT AND PROGRESSION OF METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE

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Metabolic dysfunction-associated steatotic liver disease (MASLD) is a progressive spectrum of liver diseases that begins with benign fat accumulation in hepatocytes (steatosis), followed by inflammation and damage to hepatocytes - nonalcoholic steatohepatitis (NASH) and progresses to liver fibrosis (LF). Elucidation of epigenetic factors, such as DNA methylation, that predispose an individual to MASLD may lead to development of noninvasive biomarkers for early diagnosis of MASLD and may allow early preventive and therapeutic strategies for the people at the high risk.

The study included a review of integrative epigenomic analysis developed by the US National Institutes of Health Roadmap Epigenomics Mapping Consortium (Nature, 2015) and The Encyclopedia of DNA Elements project (Nature, 2012).

Growing evidence suggests that lean MASLD progression is substantially influenced by DNA methylation. DNA methylation is a universal chemical modification by which methyl groups are added to the DNA molecule. In a study of liver mitochondrial DNA methylation by Pirola et al. (2013), significantly higher methylation of mitochondrial gene nicotinamide adenine dinucleotide dehydrogenase-6 and lower messenger RNA (mRNA) levels was reported in NASH patients in comparison to simple steatosis patients. This points towards an association of hepatic methylation and transcriptional downregulation of dinucleotide dehydrogenase-6 with the severity of MASLD. Ahrens et al. (2013), using genome wide DNA methylation analysis from liver samples of 45 morbidly obese patients in different stages of MASLD, extracted 9 MASLD associated genes exhibiting variation in methylation. In the study by Baumeier C., et al. (2017) it was demonstrated that relationship of increased hepatic dipeptidyl peptidase-4 expression levels and corresponding reduction in DNA methylation was observed in human liver biopsies to different hepatosteatosis and NASH stages which suggested a very complex intertwined regulation of fuel metabolism through epigenetic modulation. In an epigenomic analysis by Johnson N. D., et al. (2021) it was demonstrated that DNA methylation is a mechanism underlying changes in the cellular composition of hepatocytes in the pathogenesis of MASLD, including the development of LF.

The study of DNA methylation is a promising field of modern science for understanding the influence of epigenetic factors on the development and progression of MASLD.

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FORMATION OF MOTIVATION FOR STUDENTS IN HIGHER EDUCATION

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Motivation for learning is a rather difficult and ambiguous process of changing the attitude of a person, both to a particular subject of study and to the whole educational process. Therefore, the question of the incentives and motives of students' educational and professional activity becomes especially important.

To define the essence, role, and significance of motivation in students' educational activity; to reveal the influence of motives and incentives on the formation of cognitive activity, professional skills, and personal development; and to substantiate ways to increase the level of educational and professional motivation of future specialists in the modern system of higher education.

An important task of higher education is to form professional motives for students' education, to develop in them the need to master professional knowledge, skills and skills. In the presence of professional motivation the student's cognitive activity has a detailed, passionate and persistent character. In a three-pronged task: learning, mental development and upbringing - a connected link is the interest of the learning subject. A display of respect for students. Whatever the student, he in any case requires a proper attitude. These motives can coalesce, forming a common motivation for learning. The reasons that stimulate a person and encourage him to be active, in this case - to study - can be various. Since the true source of a person's motivation is in himself, it is necessary that he himself wants to do something and do it. Therefore, the main motive of learning is the internal motivating force. So, the motivation for the student is the desire to study for the sake of achieving not only an academic goal, but also for professional growth.

So, content training students, focused on the formation of systemic knowledge, helps to master future professionals a system of theoretical knowledge and practical skills that will allow them to adapt to changing conditions, make and make decisions in practice.