

**EXAMINATION OF SPERMATOZOA IN LABORATORY CONDITIONS
AND THEIR CHARACTERISTICS**

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Abstract: The aim of this study is to examine spermatozoa under laboratory conditions and determine their characteristics. The morphology, microscopic structure, motility level, and biochemical properties of spermatozoa, including ATP levels, are analyzed using laboratory methods. The results of the research contribute to forming scientific foundations for evaluating spermatozoa function in the fields of reproductive biology and clinical diagnostics.

Keywords: spermatozoon, laboratory examination, morphology, motility, ATP

Introduction: Spermatozoa are among the most essential cells of the human reproductive system, and their motility, morphology, and biochemical properties are key indicators in assessing reproductive health and fertility. Studying spermatozoa in laboratory conditions is important not only for scientific research but also for clinical diagnostics. Modern laboratory methods allow for determining sperm quality, measuring ATP levels as an energy source, and evaluating morphological characteristics. Furthermore, laboratory examination of spermatozoa serves as an important tool in improving reproductive health and detecting reproductive pathologies.

Main Part: Studying spermatozoa in laboratory conditions consists of several stages. First, a sample is collected, and it is crucial to follow proper storage conditions, as the viability and motility of spermatozoa depend on these factors. Microscopic analysis allows assessment of sperm morphology, shape, and movement characteristics. Motility is considered one of the primary parameters indicating the reproductive potential of spermatozoa.

Biochemical analyses make it possible to determine intracellular energy sources, including ATP levels. ATP ensures sperm movement through the flagellum and supports intracellular processes. Laboratory methods also help evaluate sperm viability—their ability to survive.

Modern laboratory techniques, including microscopy, biological staining methods, and biochemical analyses, provide opportunities to qualitatively assess spermatozoa and apply these results in reproductive diagnostics. The findings of the study contribute to a deeper understanding of sperm characteristics and form a basis for improving health outcomes in clinical practice.

Conclusion: During the study, the morphology, motility, and ATP levels of spermatozoa under laboratory conditions were analyzed. The obtained results confirmed the effectiveness of microscopic and biochemical methods in identifying the individual characteristics of spermatozoa. The research achieved its objectives and strengthened the scientific foundations for assessing sperm quality in laboratory diagnostics. These findings demonstrate their practical significance in evaluating sperm function in reproductive biology and clinical diagnostics, as well as in assessing reproductive health.

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