

THE 67<sup>TH</sup> INTERNATIONAL



# OPEN READINGS

CONFERENCE FOR STUDENTS OF PHYSICS AND NATURAL SCIENCES

**BOOK OF  
ABSTRACTS**

**2024**



Vilnius  
University

VILNIUS UNIVERSITY PRESS

Editors:

Martynas Keršys  
Rimantas Naina  
Vincentas Adomaitis  
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Cover and Interior Design:

Goda Grybauskaitė

Vilnius University Press  
9 Saulėtekio Av., III Building, LT-10222 Vilnius  
info@leidykla.vu.lt, [www.leidykla.vu.lt/en/](http://www.leidykla.vu.lt/en/)  
[www.knygynas.vu.lt](http://www.knygynas.vu.lt), [www.journals.vu.lt](http://www.journals.vu.lt)

Bibliographic information is available  
on the Lithuanian Integral Library Information System (LIBIS) portal [www.ibiblioteka.lt](http://www.ibiblioteka.lt)  
ISBN 978-609-07-1051-7 (PDF)

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## APPLICATION OF GOLD NANORODS TOWARDS THE DEVELOPMENT OF ELECTROCHEMICAL BIOSENSORS

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Gold nanoparticles (AuNPs) are attracting great research interest due to their unique physical and chemical properties. This makes them multifunctional materials suitable for applications in various fields such as medicine, environment, and engineering [1].

Among AuNPs, gold nanorods (AuNRs) are in high demand due to the tunability and sensitivity of their longitudinal surface plasmon resonance [2, 3]. The anisotropic structure of AuNRs exhibits two surface plasmon bands corresponding to surface electron oscillation on the transverse and longitudinal sides [4]. The size, shape, and surface functionality of AuNPs are dependent on the synthesis method [5-6].

The main objective of this research was to synthesize AuNRs of different lengths using different synthesis methods and to determine their electrochemical properties. The obtained AuNRs were characterized using SEM and UV-VIS techniques. These techniques allowed a detailed description of the structural and optical properties of the AuNRs and provided valuable insights into the synthesis. The cyclic voltammetry was used to evaluate the electroactive surface area of the electrodes modified with AuNRs. The results of the electrochemical characterization of electrodes were crucial to a more profound understanding of the potential applications of AuNRs.

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