



*8th
meeting on
medicinal
biotechnology*

BOOK OF
ABSTRACTS

MAY 29TH, 2026
SCHOOL OF HEALTH
POLYTECHNIC OF PORTO



BOOK OF ABSTRACTS OF THE 8TH MEETING ON MEDICINAL BIOTECHNOLOGY

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ISBN: 978-989-9226-20-3
DOI: [HTTPS://DOI.ORG/10.26537/ED.P.PORTO.251](https://doi.org/10.26537/ED.P.PORTO.251)

May, 2026



Sensing the mind: label-free miRNA-based sensor as a diagnostic tool for neurodevelopmental disorders

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Mental health disorders, including Attention-Deficit/Hyperactivity Disorder (ADHD) and autism spectrum disorder (ASD), are global public health concerns that lack accurate and fast diagnostic tools. Recent evidence highlights miR-151a-3p as a promising circulating biomarker, as its levels in plasma and saliva are associated with neurodevelopmental disorders. However, current detection methods like RT-qPCR are expensive and time-consuming, which creates a demand for innovative *point-of-care* solutions. Highly sensitive electrochemical biosensor for the direct detection of miR-151a-3p emerge as promising alternatives, in

gold screen-printed electrodes functionalized with a specific DNA-151a-3p capture probe. The biosensor's assembly and the hybridization events were monitored using cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS). Preliminary results indicate that the biosensor exhibits high selectivity and sensitivity, distinguishing the target miR-151a-3p from non-complementary sequences within biologically relevant concentration ranges. This label-free approach offers a significant advantage over traditional assays by providing a cost-effective, fast, and portable diagnostic tool.

KEYWORDS: *mir-151a-3p; electrochemical biosensor; neurodevelopmental disorders*

ACKNOWLEDGEMENTS:

This work received financial support from the PT national funds (FCT/MECI) through the project UID/50006/2025 DOI 10.54499/UID/50006/2025 -Laboratório Associado para a Química Verde - Tecnologias e Processos Limpos and from the project "Challenging the Analytical Diagnosis of Neurodevelopmental Disorders: Pioneering Neurochemical Devices", funded by FEDER funds and PT funds by FCT/MECI, operation no. 15875, with reference COMPETE2030-FEDER-00699000. Eduarda Pereira (2024.01697.BDANA) is grateful to FCT and the European Union (EU) for their grants financed by POPH-QREN-Tipologia 4.1-Formação Avançada, funded by Fundo Social Europeu (FSE) and Ministério da Ciência, Tecnologia e Ensino Superior (MCTES). M. Fátima Barroso thanks the TENURE - FCT Tenure Program - 1st Edition (Reference 2023.15797.TENURE.001). with financial support from FCT/MCTES through national funds.