

## Abstract

# Liquid Chromatography–Mass Spectrometry Application for Metabolomic Profiling of Compounds in Mycobacterial Cultures <sup>†</sup>

Elwira Sieniawska 

Department of Natural Products Chemistry, Medical University of Lublin, 20-093 Lublin, Poland; elwira.sieniawska@umlub.pl

<sup>†</sup> Presented at the 19th International Symposium “Priorities of Chemistry for a Sustainable Development”, Bucharest, Romania, 11–13 October 2023.

**Abstract:** Insight into bacterial cellular composition and functions can be obtained by the application of metabolomics. Metabolomics enables comprehensive characterization of a set of low-molecular-weight compounds which are starting, intermediate, or end products of metabolic transformations in living organisms. Metabolites are directly related to biochemical, physiological, and pathophysiological processes and they reflect the activity of genes at a particular time in a given environment. They provide information about how the environment affects organisms, including the action of potential drugs. Metabolomic intracellular fingerprinting and extracellular footprinting can provide complementary and classifying information about the mechanisms of action of antibacterial compounds. Both sets of metabolites are affected in a distinct manner when bacteria are under the influence of compounds with intracellular or extracellular targets. Liquid chromatography–mass spectrometry supported by bioinformatics was successfully applied to monitor compounds in mycobacterial cultures. Changes in tuberculosinyladenosine levels or in metabolites related to energy pools (e.g., nicotinic acid ribonucleotide, acetyl phosphate, adenosine 5'-monophosphate, and nicotinamide adenine dinucleotide) were detected after bacterial exposure to natural products.

**Keywords:** liquid chromatography–mass spectrometry; metabolites; metabolomics; mycobacterial cultures



**Citation:** Sieniawska, E. Liquid Chromatography–Mass Spectrometry Application for Metabolomic Profiling of Compounds in Mycobacterial Cultures. *Proceedings* **2023**, *90*, 5. <https://doi.org/10.3390/proceedings2023090005>

Academic Editors: Mihaela Doni, Florin Oancea and Radu Claudiu Fierăscu

Published: 6 December 2023



**Copyright:** © 2023 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Funding:** This work was funded by the Polish National Science Centre within the project 2022/45/B/NZ7/00412.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Data relevant to the presented talk are available from the author.

**Conflicts of Interest:** The author declares no conflict of interest.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.