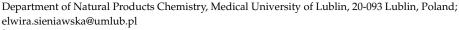


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Abstract

Liquid Chromatography–Mass Spectrometry Application for Metabolomic Profiling of Compounds in Mycobacterial Cultures [†]

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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

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