



## **HealthOmix: Advanced Multiomics and Integrative Technologies for personal and precision medicine**

*University of Warsaw: Biological and Chemical Research Centre  
Analytical Chemistry Expert Centre*

<https://cnbch.uw.edu.pl/en/analytical-chemistry-expert-centre/>

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The HealthOmix project at the Biological and Chemical Research Centre, University of Warsaw (CNBCh UW), aims to advance precision medicine through the application of state-of-the-art computational and bioinformatics technologies. Utilizing an integrative framework, the research combines metabolomics, proteomics, and elemental signature analysis to refine disease diagnostics, enhance patient monitoring, and identify novel biomarkers. By employing advanced analytical methodologies, the project facilitates the exploration of complex biological interactions, enables predictive disease modeling, and contributes to the development of personalized therapeutic strategies.

A fundamental component of HealthOmix is the integration of multi-omics data, enabling a comprehensive analysis of disease mechanisms and the discovery of novel biomarkers. State-of-the-art bioinformatics approaches, including high-throughput data processing facilitate the extraction of biologically relevant patterns from large-scale datasets. Equally crucial is the study of elemental and molecular signatures, where high-resolution analytical techniques are employed to evaluate trace element imbalances and their association with disease progression. A key aspect of HealthOmix is the integration of multi-omics data, which allows for a comprehensive understanding of disease mechanisms and the identification of novel biomarkers. Cutting-edge bioinformatics methods, including high-throughput data analysis and deep learning algorithms, are used to extract meaningful insights from large-scale biological datasets. Elemental and molecular signature analysis plays a crucial role in this research, with high-resolution techniques applied to assess trace element imbalances and their correlation

The integration of computational methodologies with experimental biology enables a more precise and targeted approach to healthcare, ensuring the effective translation of research findings into clinical applications. By leveraging state-of-the-art mass spectrometry and high-throughput bioinformatical tools, HealthOmix can be redefine precision medicine. The project contributes to global efforts to bridge the gap between computational science and clinical practice, fostering the development of more advanced diagnostic tools, personalized treatment strategies, and predictive healthcare solutions. Through interdisciplinary collaboration with leading international institutions in biotechnology and medicine, HealthOmix seeks to drive innovation in patient care and disease management.

The HealthOmix project is conducted in a laboratory accredited by the Polish Centre for Accreditation (PCA) (Certificate No. AB 1525), guaranteeing the highest standards of competence and quality. Furthermore, the university's medical laboratory is officially registered with the National Chamber of Laboratory Diagnosticians (Registry No. 4085), underscoring its commitment to professional excellence and regulatory Compliance.

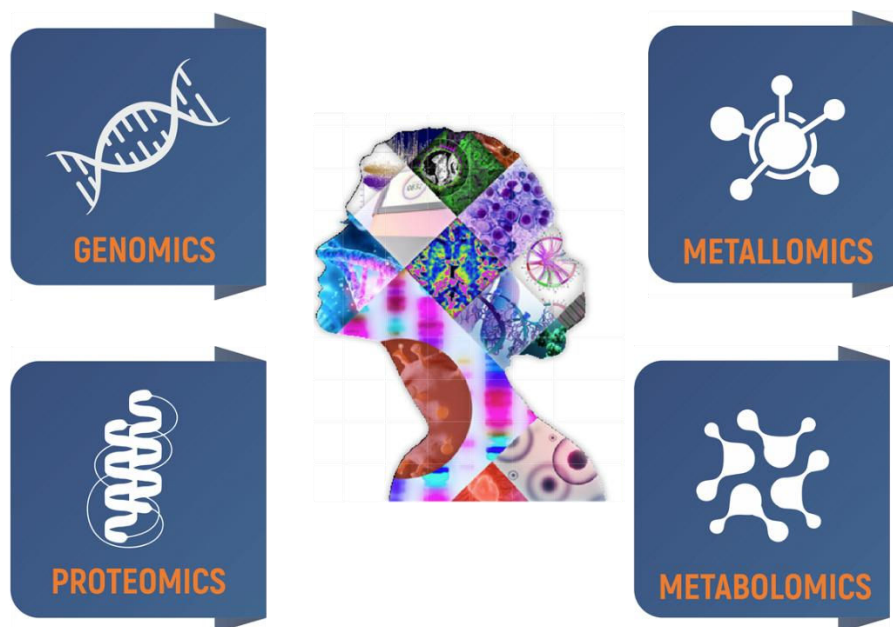


Figure 1. Multiomics: a holistic view of human health

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