Modern technologies and 3P medicine

Halina Podbielska
Department of Biomedical Engineering
Wrocław University of Science and Technology

3 October 2023

Abstract

In recent years, the field of healthcare has undergone a significant transformation, largely driven by advances in modern technologies. One of the most prominent shifts in healthcare is the move towards personalised, preventive, and predictive medicine, which holds the promise of revolutionising the way we approach healthcare and disease management. Modern technologies have played a pivotal role in making personalised medicine a reality. Next-generation sequencing technologies has made it possible to sequence an individual's entire genome quickly and cost-effectively. Biomarkers can provide insights into an individual's health status. Machine learning algorithms can analyse vast datasets of patient information to identify patterns and predict disease risk. This enables healthcare providers to make more informed decisions and tailor treatments to the patient's unique profile.

On the other hand, preventive medicine focuses on keeping individuals healthy and reducing the risk of developing diseases. Modern technologies have empowered healthcare professionals to take a proactive approach to prevention. Here, it is worth to mention wearable devices, telemedicine, electronic health records (EHRs) and health information systems enabling healthcare providers to track patient health histories and recommend appropriate preventive measures. Predictive medicine uses data and algorithms to forecast disease risk and outcomes. It allows for early intervention and more effective treatments.

The merging of modern technologies with personalised, preventive, and predictive medicine is reshaping the healthcare landscape. As these technologies continue to evolve, they hold the potential to significantly improve health outcomes and reduce the burden of disease on individuals and healthcare systems.

About the presenter

Prof. Dr Halina Podbielska DSc PhD Engr MD received her MSc and Engineering Degree in Applied Physics/Optics and her Habilitation degree in Applied Physics from the Faculty of Fundamental Problems of Technology of the Wrocław University of Science and Technology (WUST), and her PhD degree in Physics from the Institute of Physics. She also received her MD degree from the Faculty of Medicine of Medical University of Wrocław. She completed post-graduate study in business and management at the Faculty of Informatics and Managing at WUST conducted by the Central State University of Connecticut, USA. For many years she was engaged as a chair of the Biomedical Engineering

Department. Additionally, in years 2007–2014 she was appointed as a full professor in the Department of Physical Therapy at the Faculty of Physiotherapy of the Wroclaw University of Health and Sport Sciences. She was visiting scientist in several scientific institutions worldwide: as an A. v. Humboldt fellow at the University of Frankfurt/Main, University of Münster, and at the Weizmann Institute of Science, Israel (1989–1990). In years 2002–2005 she was a visiting professor at the Institute of Optics of Technical University in Berlin. She was also visiting scientist at the Charité Medizin University of Berlin working at the Medical Laser Technology Center LMTB, Germany. Her professional experiences include biomedical engineering with emphasis on medical application of optics, nanomaterials and physical and personalised medicine. She is an author or co-author of over 400 publications. She holds 13 registered patents. She is a Board Member of the Polish Society of Biomedical Engineering and member of many internationally recognised bodies (OSA, SPIE, OWLS, EPMA). She holds a distinction of OSA Senior Member, honorary membership of the Polish Society of Biomedical Engineering. She is a member of Editorial Board of the Journal Biocybernetics and Biomedical Engineering and EPMA Journal. Recently, she received a distinction of Professor Magnus of the Wrocław University of Science and Technology.