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*Session 3 - Plenary lecture***GENOMICS AS A BASIS FOR PRECISION MEDICINE**

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Although medicine always aimed to be personalized, true implementation of personalized medicine in health care practice has started recently. Fascinating progress of molecular genetics has strongly contributed to this great achievement of modern medicine. Personalized medicine, also known as genome-based medicine and precision medicine, uses the knowledge of molecular basis of the disease in order to individualize treatment for each patient. Development of novel powerful high-throughput technologies has enabled better insight into “oms” landscape of many diseases, resulting in application of precision medicine approaches in their treatment. There are four cornerstones of modern precision medicine: “omics”-based diagnostics, pharmacogenomics, specific molecular targeted, gene and cellular therapy and predictive genetics. One of the most important successes of precision medicine is a discovery of novel diagnostic molecular markers. Furthermore, numerous newly discovered molecular markers have contributed to more precise classification of patients in distinct prognostic groups, leading to specific, more successful treatment protocols. Development of pharmacogenomics platforms and application of molecular-targeted therapy have led to the individualization of therapy, tailored to genetic profile of a disease in each patient. The development of gene therapies which can cure or prevent a disease by targeting disease-causing molecular defect has confirmed that the precision medicine has responded successfully to a great challenge. Additionally, cellular and tissue therapies have opened new possibilities for personalized treatment of many patients. Growing knowledge in predictive genetics leads to the preventive medicine, the most important goal of modern medicine. There is no doubt that we are getting closer to full implementation of precision medicine in every day clinical practice.

Keywords: genomics, gene therapy, molecular diagnosis, molecular targeted therapy, precision medicine, pharmacogenomics, stem cell therapy

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