UNIVERSITY OF NOVI SAD
FACULTY OF MEDICINE

Study program: Integrated Academic Studies in Medicine

Course title: Personalized Medicine

Teacher: Ivana I. Kavečan, Tatjana B. Redžek Mudrinić, Slobodan D. Spasojević

Course status: elective

ECTS Credits: 3

Condition: -

Course aim

The basic aims of the elective course Personalized Medicine are to familiarize students of Integrated Academic Medicine with the basic concepts of personalized medicine. Acquiring knowledge about the possibilities of applying new technologies in medicine and clinical practice. Acquiring knowledge about the importance of team and multidisciplinary approach in everyday work. Introducing the novelty in the field of personalized medicine.

Expected outcome of the course:

While attending classes, students acquire all the necessary knowledge in the field of Personalized Medicine. Gaining knowledge of the specifics of personalized patient access from all clinical branches of medicine. Introducing of the challenges and difficulties of personalized medicine. Introducing new technologies such as microarray, next generation sequencing, whole genome sequencing. Familiarity with the possibilities of applying personalized medicine in all forms of healthcare. Acquiring knowledge about proper approach and communication with the patient with hereditary disease.

Course description

Theoretical education:

- Vision of personalized medicine
- Evidence-based medicine
- Perspectives on personalized medicine
- Challenges and difficulties of personalized medicine
- Expectations in personalized medicine
- Personalized medicine in 2020-2025.
- Innovations related to personalized medicine
- Registers, electronic databases, biobanks and personalized medicine
- Digital phenotyping
- European Alliance for Personalized Medicine
- Genome, proteome, microbiome, transcriptome, epigenetic, metabolome and personalized medicine
- Neonatology and personalized medicine
- Personalized medicine and health care (primary, secondary, tertiary)
- Personalized medicine in rehabilitation
- Personalized medicine and treatment
- Personalized medicine and prevention
- Research in personalized medicine
- Genetic, genomic and next-generation sequencing
- A team and multidisciplinary approach
- Biomarkers
- Epigenetics
- Genetic modifiers
- Enzyme replacement therapy
- Screening and early diagnosis - potential challenges
- Predisposition, screening, diagnosis, prognosis, prediction, medical monitoring, monitoring and personalized medicine
- Low incidence diseases - rare diseases
- The role of patients and associations

Practical education

- History and personalized medicine

- Introducing new technologies
- Possibility of applying digital phenotyping in practical work
- Patients and physician reports
- Practical aspect and possibilities of applying genomics
- Practical aspect and possibilities of applying proteomics
- Practical aspect and possibilities of application of interactomics, metabolomics in clinical practice
- Personalized medicine and recent therapeutic approaches - case reports
- Personalized medicine and prevention - case reports
- Preventive medical aspect of epigenetics - presentations
- Overview of the work of the Molecular Genetics Cabinet
- Benefits of personalized medicine - case reports
- Limitations of personalized medicine - case reports
- Biobanks and personalized medicine - a practical aspect
- Microarray technology
- Next generation sequencing
- Clinical exome sequencing - presentation and capabilities
- Complete genome sequencing - views and capabilities
- Preimplantation genetic testing
- Patient informed consent - display protocol
- Patient registers - view
- Patient informed consent - display protocol
- Patient associations - overview
- Practical aspect of team and multidisciplinary approach in personalized medicine

Literature

Compulsory

1. Firth H, Hurst J. Oxford Desk Reference Clinical Genetic and Genomics, 2nd Ed. Oxford University Press 2017.
2. Nussbaum RL, McInnes RR, Willard HF. Thompson and Thompson Genetics in Medicine, 8th Ed. Elsevier Science Health Science 2015.

Additional:

1. Trninić-Pjević A, Milatović S, Havrljenko J, Kavecan I, Kopitović A. Birth of a healthy child after preimplantation genetic testing in a father with Klinefelter's syndrome in Serbia. Vojnosanitetski pregled 2019 OnLine-First Issue 00, Pages: 138. https://doi.org/10.2298/VSP190715138TDi
2. Sanzo M, Cipolloni L, Borro M, La Russa R, Santurro A, Scopetti M, Simmaco M, Frati P. Clinical Applications of Personalized Medicine: A New Paradigm and Challenge. Curr Pharm Biotechnol 2017;18(3):194-203. doi: 10.2174/1389201018666170224105600.
3. Sharrer GT. Personalized Medicine: Ethical Aspects. Methods Mol Biol. 2017;1606:37-50. doi: 10.1007/978-1-4939-6990-6_3. Review.
4. Barker RW. Is precision medicine the future of healthcare? Per Med. 2017 Nov;14(6):459-461. doi: 10.2217/pme-2017-0060.
5. Goetz LH, Schork NJ. Personalized medicine: motivation, challenges, and progress. Fertil Steril. 2018 Jun;109(6):952-963. doi: 10.1016/j.fertnstert.2018.05.006.
6. Carrasco-Ramiro F, Peiró-Pastor R, Aguado B. Human genomics projects and precision medicine. Gene Ther. 2017 Sep;24(9):551-561. doi: 10.1038/gt.2017.77.
7. Shoaib M, Rameez MAM, Hussain SA, Madadin M, Menezes RG. Personalized Medicine in a New Genomic Era: Ethical and Legal Aspects. Sci Eng Ethics. 2017 Aug;23(4):1207-1212. doi: 10.1007/s11948-016-9828-4.

Number of active classes	**Theoretical classes:** 15	**Practical classes:** 30

Teaching methods:

Lectures. Practical classes: Case reports of patients and the possibilities of applying personalized medicine. Outline of the work of the Medical Genetics Service: an outline of the work of the Medical Genetics Department, the Family Planning Cabinet, the Cytogenetic Laboratories, the Molecular Genetics Cabinet.

Student activity assessment (maximally 100 points)

Pre-exam activities	points	**Final exam**	points
Lectures	20	Written	20
Practices	30	Oral	30
Colloquium		.....	
Essay			