

REQUIREMENTS

Semmelweis University Faculty of Medicine, Department of Anatomy, Histology and Embryology	Faculty, Department:
Name of the course: Systems Neuroscience I. Systems Biology: Neuronal genomics and proteomics Type of course: optional course-unit code: AOSANT560_1A credit: 2	
Name of the responsible person: Dr. Gábor Gerber (Gábor Juhász, DSc)	
Academic year: 2018/2019., second semester	
Role of the course in the training of the Department: The seminar series aims to give a survey on systems biology approach of biological functions. We discuss the high-throughput methods: next generation sequencing, proteomics and mass spectrometry of proteins, and we give a survey of recently developed sophisticated technologies and mathematical analysis of data. We show the problems of single cell transcriptomics and genomics analysing the individual cells in deep sequencing technology. The basis of FDA Controlling Science Initiative and EU recommendation for development of systems biology education, lab work and data processing in health industry. Course includes visiting experimental labs of the teachers.	
The program of the course: 1. Lecture: Introduction to systems biology I 2. Lecture: Introduction to systems biology II 3. Lecture: Introduction to systems biology III 4. Lecture: Personalized medicine I 5. Lecture: Personalized medicine II 6. Lecture: Changes in view, new interpretation of phenotype I 7. Lecture: Changes in view, new interpretation of phenotype II 8. Lecture: Changes in view, new interpretation of phenotype III 9. Lecture: Changes in view, new interpretation of phenotype IV 10. Lecture: Changes in view, new interpretation of phenotype V 11. Lecture: Methods of genomics and proteomics I 12. Lecture: Methods of genomics and proteomics II 13. Lecture: Methods of genomics and proteomics III 14. Lecture: Methods of genomics and proteomics IV 15. Lecture: Methods of genomics and proteomics V 16. Lecture: Controlling Science I 17. Lecture: Controlling Science II 18. Lecture: Upcoming revolution in medicine I 19. Lecture: Upcoming revolution in medicine II 20. Lecture: Upcoming revolution in medicine III 21. Lecture: Students' presentations, discussion I 22. Lecture: Students' presentations, discussion II 23. Lecture: Students' presentations, discussion III 24. Lecture: Written test	

25. Lecture: Written test Practical courses: 1. Course: High throughput proteome and genome analyses techniques I 2. Course: High throughput proteome and genome analyses techniques II 3. Course: High throughput proteome and genome analyses techniques III Consultations: personally with the actual course leader
Requirements of course participation and options to recover missed hours: 1. Total absence allowed: 10% of the course hours 2. Recovering missing hours: studying the material provided by the course leaders, consultation Eligibility: US grade point average (GPA) of 3.0. Students with a GPA lower than 3.0 should inquire with the Directors on the possibility of a waiver.
Justification of absence from course hours or exams: Hungarian medical certificate
Number and schedule of the examinations: 1 on the last day of the course
Requirements of the successful completion of the program: written or oral test in each course material
Marks: In case of a written test grades are given after obtaining points as follows: 0-50% fail, 51-60% pass, 61-75% fair, 76-90% good, above 90% excellent.
Types of exam: test, essay, verbal
Requirements of the examinations: Verbal and electronic etc. material provided by the lecturers. Syllabus is available upon opening the program on the web page.
Registration for exams: NEPTUN
Rescheduling the tests: N/A Each student has to take an examination in each block of the course.
Justification of absence from the exam: Hungarian medical certificate (see above).
List of useful literature (books, papers etc): E. De Schutter (2008). Why are computational neuroscience and systems biology so separate? PLoS Comp. Biology 4: e1000078. Fernald GH, Capriotti E, Daneshjou R, Karczewski KJ, Altman RB. (2011) Bioinformatics Challenges for Personalized Medicine. Bioinformatics 27 (13): 1741-1748. Guidance for Industry. E15 Definitions for Genomic Biomarkers, Pharmacogenomics, Pharmacogenetics,

Genomic Data and Sample Coding Categories. U.S. Department of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research (CDER), Center for Biologics Evaluation and Research (CBER), April 2008, International Conference on Harmonisation (ICH).
<https://www.fda.gov/downloads/drugs/guidancecomplianceregulatoryinformation/guidances/ucm073162.pdf>

- OMICS in personalised medicine. Workshop to explore the role of -omics in the development of personalised medicine. European Commission, DG Research - Brussels, 29-30 April 2010.
https://ec.europa.eu/research/health/pdf/summary-report-omics-for-personalised-medicine-workshop_en.pdf

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