

CU The Role of Microbiome in Health and Disease

CU characterization:

CU name: The Role of Microbiome in Health and Disease

Scientific area acronym: XXXX

Duration: Semiannual

Working hours: 168

Contact hours:

T 20 TP 8 PL S 4 E OT 2 T (Theoretical), TP (Theoretical-practical), PL (Laboratory Practice), S (Seminar), E(Internship).

ECTS:

6

Observations: Observations

Teacher in charge and respective teaching load in the CU: Paulo Jorge Pereira Cruz Paixão – 8 hours

Other teachers and respective teaching load in the CU: Fernando Santos – 2 hours Teresa Costa – 1.5 hours João Diniz de Araújo – 6 hours Cláudia Marques – 3 hours Maria de Jesus Chasqueira – 10 hours Carla Mottola – 3 hours Sara Querido – 2 hours



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Intended learning outcomes (knowledge, skills and competences to be developed by the students):

- Understanding the relationship of the microbiome with health and disease;
- To know the role of the intestinal microbiota for the physiological balance;

- To know the role of the microbioma in the different infections (genito-urinary, cutaneous, respiratory, rheumatologic);

- Understanding the role of the microbiome in diabetes and transplantation;
- To know the methodologies of analysis of the microbioma.

Syllabus:

- Introduction to the microbiome and its relationship with health and disease;
- The contribution of the microbiome to the physiological balance;
- The importance of the microbiome in some of the major human infections;
- General concepts of real-time PCR and specific application to the study of the microbiome;

- Principle and importance of the metagenomic analysis in the identification and characterization of the human microbiome.

Evidence of the syllabus coherence with the CU intended learning outcomes:

The program provides the tools that will enable students to achieve its objectives, including the general principles of epidemiology and associated clinical (lectures).

Teaching methodologies (including assessment):

Theoretical classes will be taught by the teachers of the course via Zoom, depending on their respective specializations. The form of lecture, in which they will address issues considered essential by providing data to guide students to individual study.

Student assessment – Final written examination with a multiple choice test of 20 questions (duration 30 minutes) 50% (Face-to-face).

Oral presentation and discussion of topics by groups of two students. Topics are distributed at the beginning of the course and the presentation of each theme has a duration of 20 minutes 50%.

The student will be excluded if the exam grade is less than 9.5.

Evidence of the teaching methodologies coherence with the CU intended learning outcomes:

The objectives of understanding the main aspects of the microbiome and its relation to health the disease will be taught during theoretical classes.

References for consultation / mandatory existence:

- Andersen SB, Shapiro BJ, Vandenbroucke-Grauls C, de Vos MGJ. Microbial evolutionary medicine: from theory to clinical practice. Lancet Infect Dis. 2019 Apr 30. pii: S1473-3099(19)30045-3. doi: 10.1016/S1473-3099(19)30045-3
- - Elizabeth Grice and Julia Segre. "The skin microbiome". Nature Reviews Microbiology, 2011 April; 9(4): 244–253.
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5613173/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8861789/



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- Li X, Liu Y, Yang X, Li C, Zhangyong Song Z. The Oral Microbiota: Community Composition, Influencing Factors, Pathogenesis, and Interventions. Front Microbiol. 2022. 29:13:895537.
- Michael Austin Loesche. "Temporal dynamics of the skin microbiome in disease. University of Pennsylvania, 2016. https://repository.upenn.edu/edissertations/2444
- Noecker C, McNally CP, Eng A, Borenstein E High-resolution characterization of the human microbiome. Transl Res. 2017 Jan;179:7-23.
- Ranjan R, Rani A, Metwally A, McGee HS, Perkins DL. Analysis of the microbiome: Advantages of whole genome shotgun versus 16S amplicon sequencing. Biochem Biophys Res Commun. 2016 Jan 22;469(4):967-77.
- Y. Erin Chen. "Skin microbiota-host interactions". Nature, 2018 January 24; 553(7689): 427–436.
- Vázquez-Baeza Y, Callewaert C, Debelius J, Hyde E, Marotz C, Morton JT, Swafford A, Vrbanac A3, Dorrestein PC. Knight R Impacts of the Human Gut Microbiome on Therapeutics. Annu Rev Pharmacol Toxicol. 2018 Jan 6;58:253-270
- Keller JJ, Ooijevaar RE, Hvas CL, Terveer EM, Lieberknecht SC, Högenauer C, Arkkila P, Sokol H, Gridnyev O, Mégraud F, Kump PK, Nakov R, Goldenberg SD, Satokari R, Tkatch S, Sanguinetti M, Cammarota G, Dorofeev A, Gubska O, Ianiro G, Mattila E, Arasaradnam RP, Sarin SK, Sood A, Putignani L, Alric L, Baunwall SMD, Kupcinskas J, Link A, Goorhuis AG, Verspaget HW, Ponsioen C, Hold GL, Tilg H, Kassam Z, Kuijper EJ, Gasbarrini A, Mulder CJJ, Williams HRT, Vehreschild MJGT. A standardised model for stool banking for faecal microbiota transplantation: a consensus report from a multidisciplinary UEG working group. United European Gastroenterol J. 2021 Mar;9(2):229-247.