Teaching for international courses  
Visiting Professors  
Academic year 2018/2019

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| **COURSE TITLE**  
Molecular Therapy in Nephrology: focus on regenerative medicine |
| **Scientific area**  
Renal Physiology and Regenerative Medicine  
Department of Molecular Biotechnology and Health Sciences |
| **Language used to teach**  
English |
| **Teaching Commitment**: 42 hours |

**Course summary**

The course approaches the complex architecture of the kidney associated with its functions (elimination toxic substances from metabolism, maintenance of osmolarity and electrolyte balance in the human body, regulation of the acid-base balance and hormone production). Different cell types constitute the kidney and each one presents a specific role to maintain the homeostatic state. The course will delineate factors like aging, obesity, diabetes, auto-immunity and hypertension can cause changes in renal tissue and trigger events that jeopardize kidney function, leading to development of renal diseases. Regenerative process can occur after insult, however, depending on the severity of the injury the intrinsic capacity of the kidney to recover may not be sufficient. Dialysis and transplant are the only treatments available. The course will focus on new approaches of Regenerative Medicine as tools for treatment of kidney diseases, including strategies based on stem cell therapy, organoids, 3D-printing, gene editing and kidney scaffolds. The course is composed by lessons, discussion of high impact published works, seminars prepared by the students to evaluate their comprehension about the subjects.

**Learning objectives**

The objective of this course is to give students a complete vision of human kidney physiology, based on well stablished concepts and new perspectives present in the frontier of knowledge, aiming to the development of the reasoning, fundamental to the understanding interrelationship of the physiological processes that occur in the organism. This enables students to develop the ability to associate the theoretical information and apply in daily phenomes as well as new concepts with which they will be presented. In addition, the course expects to bring to the student’s awareness new techniques in the Regenerative Medicine applied in tissue regeneration and arouse their interest in scientific methods related to the research to increase their academic education.
**Visiting Professor Profile**
The profile required is that of a researcher with high knowledge of human renal pathophysiology, with experience in Regenerative Medicine and in preclinical and clinical approaches for renal regeneration. A preferential profile is related to interest and research experience in stem cell regulation of injury/regenerative process in acute and chronic renal disease and on molecular biology approaches, including cell reprogramming and epigenetic modulation by microRNAs. Finally, knowledge on animal models of renal diseases is required.

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