



Departamento de
Física de la
Materia Condensada
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How cellular forces and tissue mechanics regulate cell biology

Biology helps us to understand life, being the cell the smallest basic unit of structure and function that is regulated by various signals from the microenvironment. Mechanical factors are particularly important in this regulation. Thus, mechanobiology focuses on understanding how physical forces regulate changes in the mechanical properties of tissues and cells that subsequently contribute to the physiological functioning of our organism and to that of a disease or pathology. These mechanical forces act not only at the level of an organ but play a relevant role at all spatial scales that make up our tissues, involving the cells and proteins that define them.

This talk will begin with a brief and very basic introduction to mechanobiology. We will then explore the role of mechanobiology at different scales with a more detailed analysis of the mechanopathology of cancer and tumor metastasis. To this end, a dual methodological approach based on computer simulation and microfluidics-based 3D cell culture will be used.

JMGA has devoted his entire research career to the application of engineering technologies to the major problems of our society in the field of Health, especially in Regenerative Medicine, Tissue Engineering, Tumor Metastasis and Immunotherapy.

As a result of this work JMGA presents more than 160 JCR publications with a total of 10262 citations according to Google Scholar. As Principal Investigator JMGA has been leading different European projects of recognized prestige. In fact, he has coordinated up to four ERC (European Research Council) projects: a Starting, two Proof-of-Concepts and an Advanced. He has held different scientific responsibilities at national and international level, including as Vice-President of the European Society of Biomechanics (2008-2012). His level of internationalization is very remarkable, having made research stays in recognized universities (Oxford, Cambridge, Keele University, KU Leuven and NUI Galway).

Con la colaboración de:



10 Mayo (viernes)

HORA: 12:30

**SALÓN DE ACTOS DE
MATEMÁTICAS**