

Title:

MICROSCOPIC LEVEL PHYSICAL EFFECTS IN MEDICAL APPLICATIONS

Short Abstract:

The advances in Manufacturing Engineering and Materials Engineering, such as in 3D Printing methods and materials or in micro - nanotechnologies, are boosting the development of medical technologies with an increased intensity after Covid – 19 pandemic. The presentation focuses on some of the results of The Biomaterials Research Group in the field of drug delivery for various applications that are hardly approachable through traditional methods and on designing / manufacturing of medical devices employed for directly controlling, by the means of physical effects, the culturing of live cells. For this purpose, microfluidic devices were designed to employ physical field effects (dielectrophoretic, electrophoretic, magnetic, gravitational) to separate, from biological fluids, certain blood cells or lymphoid cells or to work as bioreactors assisting the culturing of bacteria or fungi, in view of optimizing the therapeutic strategies. Also, capillary effects based on paper microfluidics principles were employed for the use of adhesives in surgery wound healing.