

“From micro and macro mathematical models to clinical applications in glioblastoma multiforme”

Victor Perez Garcia, Universidad Castilla-La Mancha

Abstract: In this talk I will present two mathematical models of the most frequent and lethal kind of brain tumor: glioblastoma multiforme. First, I will describe a macroscopic simple model that suggests the use of certain geometrical measures as indicators of aggressiveness of these tumors. The validation using data from 200 patients will be presented leading to a new predictive survival indicator suggested by the mathematical model. Next I will describe a microscopic model which allows to: (i) explain certain features of the tumor observed in pathological samples, (ii) suggest novel experiments developed on microfluidic devices with outstanding agreement with the experiment and (iii) suggest novel therapies that have been validated in different animal models.