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Seminario su

Nanotechnology and mathematical modelling in tissue engineering

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Neural cells are the smallest building blocks of the central and peripheral nervous systems. Information in neural networks and cell-substrate interactions have been heretofore studied separately.

Understanding whether surface nano-topography can direct nerve cells assembly into computational efficient networks may provide new tools and criteria for tissue engineering and regenerative medicine. In this talk, I will explain how information theory can be used to examine information flows in neural networks cultured on surfaces with controlled topography. I will show how substrate roughness affects networks topology and how this, in turn, influences the computational performance of the network.

Moreover, I will show that the energy density of a network of cells correlates to its topology. This reinforces the view that information, energy and surface nano-topography are tightly inter-connected and should not be neglected when studying cell-cell interactions in neural tissue repair and regeneration.