CMM
Center for
Mathematical
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cmm.uchile.cl

Beauchef 851, Edificio Norte, piso 7
Santiago, CHILE
CP 837 0456

tel +56 2 2978 4870

CMM PDE Seminar

Speaker: Nicolás Torres (U. de Granada, España)

Title: A qualitative analysis of an Aβ-monomer model with inflammation processes for Alzheimer's disease.

Abstract: We introduce and study a new model for the progression of Alzheimer's disease incorporating the interactions of A_beta-monomers, oligomers, microglial cells and interleukins with neurons through different mechanisms such as protein polymerization, inflammation processes and neural stress reactions. In order to understand the complete interactions between these elements, we study a spatially-homogeneous simplified model that allows to determine the effect of key parameters such as degradation rates in the asymptotic behavior of the system and the stability of equilibriums. We observe that inflammation appears to be a crucial factor in the initiation and progression of Alzheimer's disease through a phenomenon of hysteresis, which means that there exists a critical threshold of initial concentration of interleukins that determines if the disease persists or not in the long term. These results give perspectives on possible anti-inflammatory treatments that could be applied to mitigate the progression of Alzheimer's disease. We also present numerical simulations that allow to observe the effect of initial inflammation and concentration of monomers in our model.

Lugar y fecha: Sala de Seminarios (quinto piso), 15 de enero a las 12:00 hs.

For further information, see our webpage: **https://eventos.cmm.uchile.cl/pdeseminar/**