Viral entry in cells

M. R. D'Orsogna (Northridge, California)

Successful viral infection of a healthy cell requires complex host-pathogen interactions. In this talk we focus on the dynamics specific to the HIV virus entering a eucaryotic cell.
We model viral entry as a stochastic engagement of receptors and coreceptors on the cell surface.
We also consider the transport of virus material to the cell nucleus by coupling microtubular motion to the concurrent biochemical transformations that render the viral material competent for nuclear entry.
We discuss both mathematical and biological consequences of our model, such as the formulation of an effective integrodifferential boundary condition embodying a memory kernel and optimal timing in maximizing viral probabilities.