



SEMINARIO DI MATEMATICA APPLICATA



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Sala di Rappresentanza, Dipartimento di Matematica (Via Saldini 50, Milano)

Hybrid Modelling of Tumor-induced Angiogenesis

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When modeling of tumor-driven angiogenesis, a major source of analytical and computational complexity is the strong coupling between the kinetic parameters of the relevant stochastic branching-and-growth of the capillary network, and the family of interacting underlying fields. To reduce this complexity, we take advantage of the system intrinsic multiscale structure: we describe the stochastic cell dynamics at their natural microscale, whereas we describe the deterministic dynamics of the underlying fields at a larger macroscale. We set up a conceptual stochastic model including branching, elongation, and anastomosis of vessels and derive a mean field approximation for their densities. This leads to a deterministic integro-partial differential system that describes the formation of the stochastic vessel network. We discuss the proper capillary injecting boundary conditions and find a reduced description by Chapman-Enskog perturbation methods. We include the results of relevant numerical simulations.

La home page del seminario è <http://www.mat.unimi.it/users/veeser/sma/>
Il seminario è organizzato dal Dipartimento di Matematica dell'Università di Milano in collaborazione col Centro ADAMSS (ADvanced Applied Mathematical and Statistical Sciences) e il Dottorato di Ricerca in Scienze Matematiche