DEPARTAMENTO DE
MATÉMÁTICA APLICADA

Instituto de Matemática Interdisciplinar

Seminario de Matemática Aplicada

Robert Gatenby

Moffit Cancer Research Center of Florida, USA

"The Darwinian Dynamics of Cancer"

ABSTRACT:

Invasive cancer emerges following a complex, multistep process often described as "somatic evolution." Models of carcinogenesis are typically based on the Darwinian principle that evolution requires genetic and/or epigenetic changes that generate new phenotypes. However, the models do not typically address why these specific phenotypic/ genotypic changes are necessary for carcinogenesis or why they occur in the observed sequence. I propose carcinogenesis is a sequence of successful adaptations to six distinct microenvironmental proliferation barriers that arise in the adaptive landscapes generated by normal and premalignant populations growing on epithelial surfaces. The genotypic and phenotypic heterogeneity of cancer populations is explained by an "ecological equivalence" in which multiple strategies can successfully adapt to the same barrier. This model provides a theoretical framework in which the diverse cancer geno-/phenotypes to be understood according to their roles in overcoming specific microenvironmental growth constraints.

Organizado por el Departamento de Matemática Aplicada de la UCM,
y el IMI-Instituto de Matemática Interdisciplinar

Fecha: Martes 25 de mayo de 2010 a las 11.30 hrs.

Seminario Alberto Dou (aula 209)

Facultad de Ciencias Matemáticas, UCM.