

Abstract Submitted
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Phospho-proteins patial gradients in a cell of spheroidal shape

GERARDO SOSA, Facultad de Ciencias, UNAM (MEXICO), GUILLERMO RAMIREZ-SANTIAGO, Instituto de Fisica, UNAM (MEXICO) — Many signalling proteins undergo phosphorylated-dephosphorylated cycles at different locations inside the cell. These cycles give rise to spatial gradients of phosphoproteins. In this work we solve the reaction-diffusion equation in a spheroidal geometry and investigate the diffusion of the phosphorylated form of the proteins to evaluate the size of the spatial gradients. This is done in terms of diffusion coefficients as well as protein kinase and phosphatase activities. Previous estimations of these gradients have been done for two geometries [1]: (i) a spherical cell and (ii) for a kinase and a protein each one located on two parallel planar membranes. This type of quantitative analyzes may have important implications in the cellular signaling processes [2].

[1] G.C. Brown, B.N. Kholodenko, FEBS Letters, vol. 457, p. 452-454

[2] B.N. Kholodenko, G.C. Brown, J.B. Hoek, Biochem. J. vol. 350, p. 901-907.

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