Seminário

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Mechanochemical waves in living cells: a model of an active poroelastic cytoplasm

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Local: Anfiteatro 3, Faculdade de Engenharia
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Resumo

We incorporate the active stress into a two-phase model of the cytoplasm which accounts for the spatiotemporal dynamics of the cytoskeleton and the cytosol. The cytoskeleton is described as a solid matrix that together with the cytosol as interstitial fluid constitutes a poroelastic material. We find different forms of mechanochemical waves including traveling, standing and rotating waves by employing linear stability analysis and numerical simulations. We extend this simple poroelastic model by the incorporation of biochemical reactions to describe diverse cellular phenomena and apply the predictions to experimental local deformations on protoplasmic droplets of Physarum polycephalum.

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