Modelling surface-bulk couplings in cell migration with unfitted finite elements

Martina Gatti*[1,2]

[1]Politecnico di Milano – Italy
[2]Collège de France – Collège de France, EHESS, CNRS – France

Abstract

Cells migrate through their environment in various ways. Cancer cells, leukocytes, and fibroblasts, for instance, often move by freely swimming through a 3D fluid. This self-sustained motility is made possible by the contractility of the actomyosin cortex. The movement of cells is influenced by the viscosity of the cytoplasm and interstitial fluid, as well as the degree of confinement within their surroundings, but the extent and relevance of its influence is not yet clear. In this talk, we will see how we may help elucidating this with unfitted finite element methods. They are an effective tool for modeling this behavior, as they are well-suited to account for potential large deformations, such as the ones occurring during cell migration.

*Speaker