

Untitled

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Cells can exhibit different phenotypes, due to different gene expression programs. Epithelial cells form tissues while mesenchymal cells can migrate with front-rear polarization. Epithelial cells can undergo epithelial-mesenchymal transition. It is not clear how this transformation occurs, whether it is complete or partial and how to characterize these cellular states. Our group approaches this phenomenon in four lines, as follows: 1) We use the information space model to simulate EMT, focusing on metabolic states. 2) We analyze single-cell RNA sequencing data from publicly available databases. These results validate the theoretical findings from item.2) CompuCell3D Simulations of Mesenchymal Behavior: We quantitatively compare with experimental data. CompuCell3D Simulations of Epithelial Behavior: This simulation approximates an active solid. In this talk, we present partial results and the progress of this project, and its applications in digital twin tools in Medicine.