

### **310d Microrheology of Evolving Extra-Cellular Matrices**

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The mechanical and structural properties of the extra-cellular matrix (ECM) are known to deeply affect the individual behavior and fate of a cell during processes such as migration, division and differentiation. It is thus essential to characterize these properties at the length scale of a single cell, as well as to study their evolution in time. We applied a multiple particle tracking technique (MPT) to perform microrheological and structural measurements in evolving ECM-like systems. We first studied a model artificial ECM scaffold formed by the self-assembly of custom designed oligopeptides that are currently used for 3D cell culture. For this system, we resolved the gelation kinetics of the matrix. We showed that kinetics is dependent on the pH and salt concentration, reflecting the screening of the molecular charge of individual peptides. The spatial heterogeneity of the microenvironment at different times of gelation were also interrogated for this system. Overall, this study gives a better knowledge in the cultivated cell environment, as well as opens new routes for future self-assembling peptides designs. Second, MPT was applied on a natural ECM extract, that was degraded by the addition of matrix metalloproteases, thus mimicking a possible natural route used by migrating cells.