ID de Contribution: **346** Type: **Contribution orale**

Acoustic force spectroscopy for viscoelasticity of suspended cells at long timescales

vendredi 7 juillet 2023 09:27 (12 minutes)

Cells mechanical reflects a signature of the cell state, in health and disease. Various techniques have been developed to measure cell viscoelasticity, which is inherently dependent on the timescale of measurement. While several works report data at medium to short timescales (from seconds to microseconds), few are the techniques that allow viscoelastic measurement at long timescales (minutes to hours). We propose to use acoustic force spectroscopy (AFS) coupled to Reflection Interference Contrast Microscopy (RICM) to perform measurements on suspended cells, without any contact or labeling.

The AFS setup consists of a microfluidic channel with a transparent piezo on top to generate standing acoustic waves inside the channel. These acoustic waves are used to push suspended cells towards the bottom of the channel while RICM allows to determine the contact surface of the cells to the substrate, and therefore their deformation. Microgel beads of known Young's modulus are mixed with the cells and used as force sensors, allowing in situ calibration. The applied forces are modulated in order to achieve active microrheology measurements and a viscoelastic characterization of the cells. This method allows the observation of several cells in parallel, opening the way to low-frequency (10ˆ-3 Hz) active microrheology experiments, a regime still unexplored at the single-cell level.

Affiliation de l'auteur principal

Laboratoire Adhésion & Inflammation

Auteurs principaux: M. ORTEGA, Alexandre (LAI); VALOTTEAU, Claire (Laboratoire Adhesion & Inflammation); Dr RICO, Felix (LAI); M. VILLANUEVA, Lorenzo (LAI); Dr BRUSTLEIN, Sophie (LAI)

Orateur: Dr RICO, Felix (LAI)

Classification de Session: Mini-colloques: MC04 Mécanique et le vivant

Classification de thématique: MC4 Mécanique et vivant