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Contribution ID: **4602** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) (POS-41) Bringing light to force-driven events of single molecules

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Biopolymers such as collagen and DNA play a fundamental role in cell dynamics, and many physiological functions rely on events that modify their structures. Understanding how mechanical force affects biopolymer structure and function at the molecular level could help elucidate how cellular and extracellular processes are regulated by external stimuli. Furthermore, single-molecule studies can provide mechanistic insight that is relevant at higher-order scales.

In this project, we are merging single-molecule imaging with mechanical manipulation by integrating Total Internal Reflection Fluorescence (TIRF) microscopy and Magnetic Tweezers (MT) to reveal how force and temperature drive mechanisms such as binding of regulatory proteins to biopolymers. Obtaining accurate data on the force exerted by MT is essential for the comprehensive characterization of polymer behavior and its interactions with other molecules. Therefore, the development of a tailored methodology adapted specifically to our experimental goals is crucial. My role in this project includes the configuration of the MT instrument and the refinement of data collection techniques to suit the requirements of our experiments.

The analysis of these single molecule measurements could elucidate mechanisms of regulatory protein binding events to collagen and DNA's response to force and temperature. In addition, the establishment of these experiments generates a foundation for studies on many other biomolecular systems.

Keyword-1

Magnetic Tweezers

Keyword-2

Polymers

Keyword-3

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