

## **How does integrin tension affect the onset of diseases?**

The mechanical interplay between integrins and the extracellular matrix (ECM) has been identified as a critical determinant of diseases such as cancer and neurodegenerative disorders. However, comprehensive quantification of fluctuations in integrin tension has been constrained, largely due to the absence of measurement tools that possess single-molecule precision. In an endeavor to address this significant limitation, we have engineered a pioneering DNA-based single-molecule force probe, designated as the Tension Gauge Tether (TGT) and its derivatives. By synergizing the TGT assay with innovative micro and nanofabrication techniques, we investigate the spatio-temporal variations in integrin tension at a single-molecule resolution, in the contexts of cancer metastasis and amyloidosis. This seminar will commence with an introduction to the operational principle of the TGT assay, followed by a presentation of our novel findings resulting from the application of the TGT assay.