Chemical & Physical Sciences
UNIVERSITY OF TORONTO
MISSISSAUGA

Colloquium Seminar Series
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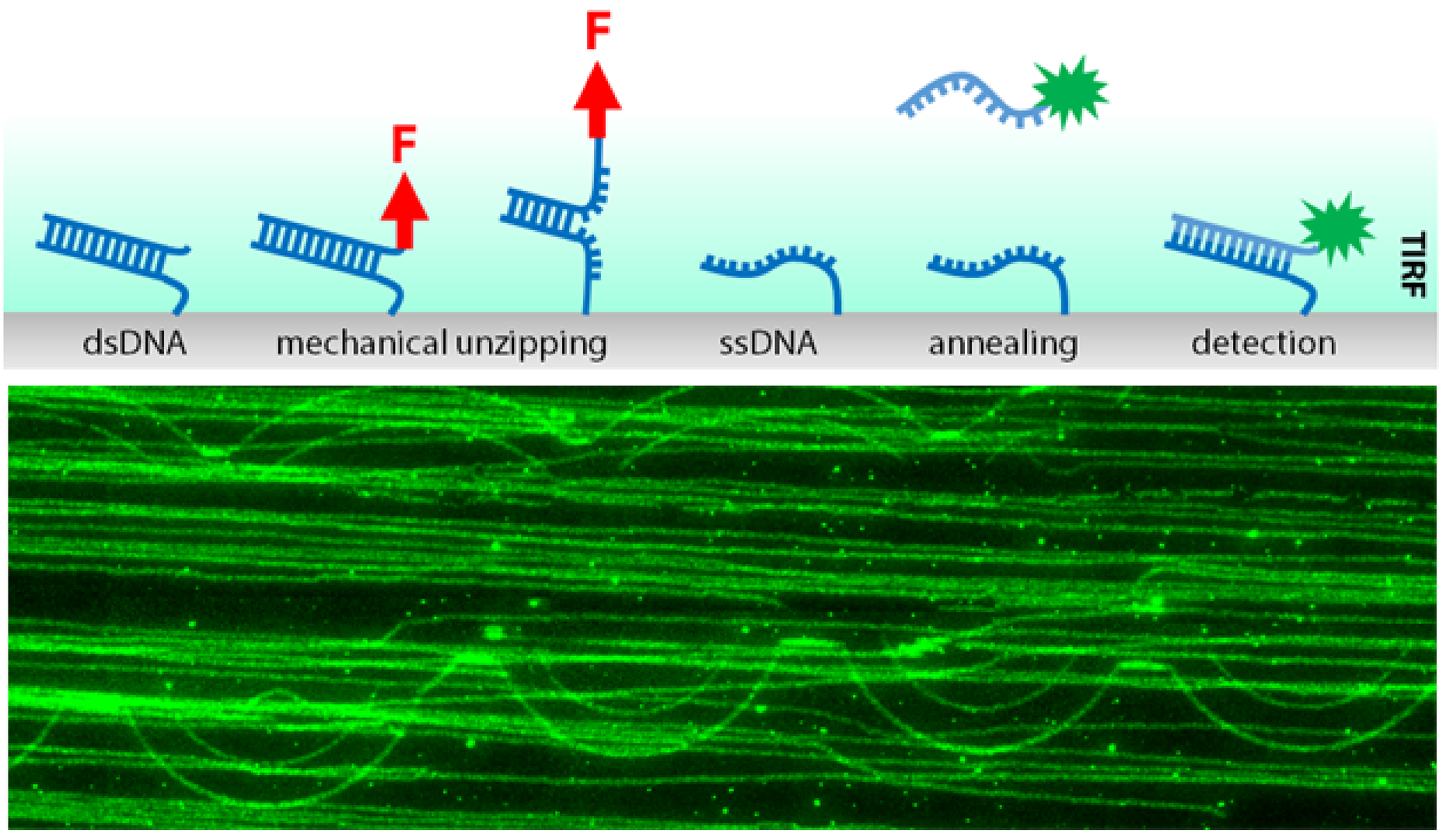
Imaging molecular force with DNA sensors



Adhesion molecules on cell surfaces help cells attach to their environment and transduce mechanically-coupled biochemical signals. To understand the mechanical forces involved at the molecular scale, molecular force sensors have been used to probe forces at cell-substrate interfaces. Several classes of force sensors have been developed in the past few years including the DNA-based Tension Gauge Tether (TGT). TGTs rely on the force-dependent dissociation of complementary dsDNA strands to probe forces where the mechanical stability can be semi-quantitatively tuned by DNA sequence and pulling geometry. We will provide an overview of the field to show the advantages and disadvantages of different classes of current force sensors. We will then show applications of TGT in studying fast dynamic molecular adhesion processes involved in cell rolling adhesion. Lastly, we will introduce a framework to quantify molecular forces using the TGTs.