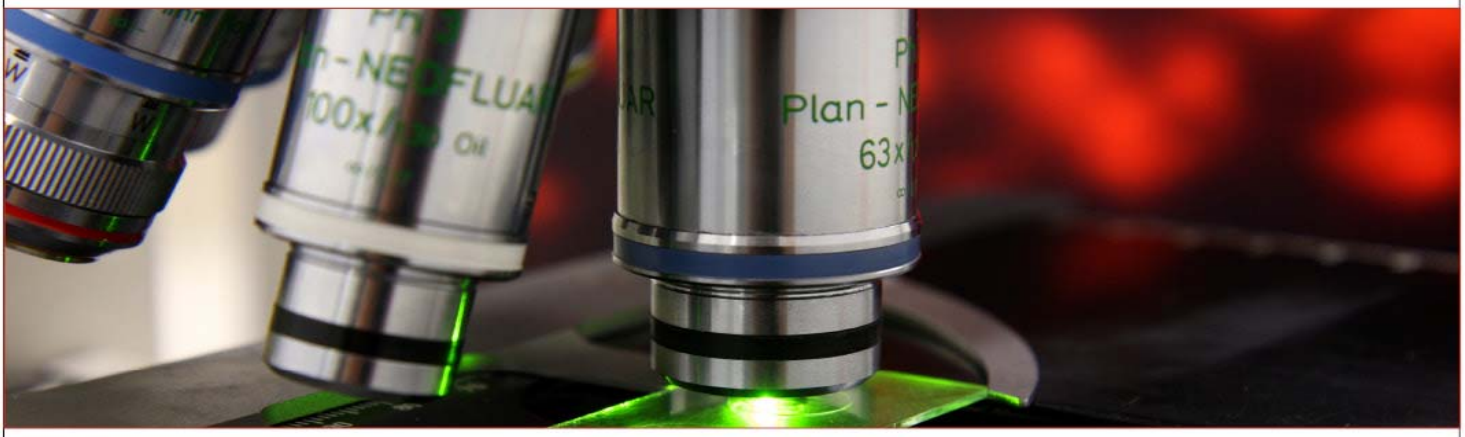
SÉMINAIRES ET CONFÉRENCES



Allan Drummond

Assistant Professor
Dept. of Biochemistry and Molecular Biology
Dept. of Human Genetics
The University of Chicago
Chicago, Illinois, USA

"Adaptive stress-triggered phase separation by an RNA-binding protein"

In eukaryotic cells, diverse stresses trigger coalescence of RNA-binding proteins into stress granules. In vitro, stress-granule-associated proteins can demix to form liquids, hydrogels, and other assemblies lacking fixed stoichiometry. Observing these phenomena has generally required conditions far removed from physiological stresses. We show that poly(A)-binding protein (Pab1 in yeast), a defining marker of stress granules, phase-separates and forms hydrogels in vitro upon exposure to physiological stress conditions. Other RNA-binding proteins depend upon low-complexity regions (LCRs) or RNA for phase separation, whereas Pab1's LCR is not required for demixing, and RNA inhibits it. Based on unique evolutionary patterns, we create LCR mutations which systematically tune its biophysical properties and Pab1 phase separation in vitro and in vivo. Mutations which impede phase separation reduce organism fitness during prolonged stress. Poly(A)-binding protein thus acts as a physiological stress sensor, exploiting phase separation to precisely mark stress onset, a broadly generalizable mechanism.

Faculté de médecine
Département de biochimie et médecine moléculaire
Université de Montréal

Le lundi 20 mars 2017, 12h00

Pavillon Roger-Gaudry
Salle : D-225

Invité par Stephen Michnick
Tél : (514) 343-5849 courriel : stephen.michnick@umontreal.ca