



## POSITION FOR A PHD STUDENT IN GENE EXPRESSION REGULATION/ SINGLE MOLECULE IMAGING

**SITE** Department of Biochemistry  
Faculty of Medicine, Université de Montréal  
Montréal City, Province of Québec, Canada

**LABORATORY OF** Dr. Daniel Zenklusen  
Assistant Professor  
Département de Biochimie  
Université de Montréal  
2900 Edouard-Montpetit, B-336  
Montréal, H3T 1J4, Québec, Canada

+1 514 343 6327 (Tel)  
+1 514 343 2210 (Fax)  
[daniel.r.zenklusen@umontreal.ca](mailto:daniel.r.zenklusen@umontreal.ca)

**WEB SITE** [http://www.biochimie.umontreal.ca/bottin411/Enseignants/zenklusen\\_d.html](http://www.biochimie.umontreal.ca/bottin411/Enseignants/zenklusen_d.html)

**LABORATORY RESEARCH THEME:** *IMAGING GENE EXPRESSION REGULATION IN SINGLE CELLS*

### PROJECT DESCRIPTION:

Coordinating transcriptional programs is a major task for cells and miss-regulation is at the origin of many diseases; a tumor can develop simply because expression of a single gene is miss-regulated. For decades, the different processes involved in gene expression control were studied by breaking up cells, isolate DNA, RNA or proteins and to analyze them. Only recently, advances in microscopy have made it possible to study these processes in their natural context, the individual cell. The main focus of our lab is to study how gene expression regulation is achieved at the single cell level using high-resolution microscopy. In particular, we combine single molecule techniques and quantitative analysis methods with mathematical modeling to gain better understanding of the general rules governing the expression of genes in complex systems. Positions for different projects in the laboratory are available:

- Dissecting mechanism and kinetics of drug induced transcription regulation using single molecule resolution live cell microscopy
- Analyzing the role of non-coding RNAs in transcription regulation
- Determining the role of gene gating in the export of single mRNAs from the nucleus to the cytoplasm

### REFERENCES (SOME RECENT PUBLICATIONS) :

- Larson D, Singer RH, **Zenklusen D**. A Single Molecule View of Gene Expression. *Trends in Cell Biology*. 2009 Nov;19(11):630-7.
- Metabolic cycling in single yeast cells from unsynchronized steady-state populations limited on glucose or phosphate. Silverman SJ, Petti AA, Slavov N, Parsons L, Briehof R, Thiberge SY, **Zenklusen D**, Gandhi SJ, Larson DR, Singer RH, Botstein D. *Proc Natl Acad Sci U S A*. 2010 Apr 13;107(15):6946-51. Epub 2010 Mar 24.
- **Zenklusen D**, Larson DR, Singer RH. Single RNA counting reveals alternative modes of gene expression in yeast. *Nature Structural & Molecular Biology*, 2008 Dec;15(12):1263-71.
- Huttelmaier S, **Zenklusen D**, Lederer M, Dichtenberg J, Lorenz M, Meng X, Bassell GJ, Condeelis J, Singer RH. Spatial regulation of beta-actin translation by Src-dependent phosphorylation of ZBP1. *Nature* 2005;438(7067):512-515.

### DISCIPLINES/ QUALIFICATIONS:

Candidates should have a formal training in biomedical sciences (ex: cell biology, biophysics, molecular biology, bioinformatics, biochemistry, etc.), have excellent organizational, interpersonal and communication skills, and have a strong interest in gene expression regulation and microscopy.

### CONTACT:

If you want to be part of a young research team doing innovative, cutting edge science, are highly motivated and like to work in a team, contact Dr Zenklusen by email. Applicants should submit a resume, university records, a short statement of research interests, TOEFL results and two letters of recommendation to [daniel.r.zenklusen@umontreal.ca](mailto:daniel.r.zenklusen@umontreal.ca), if possible in one .pdf document.