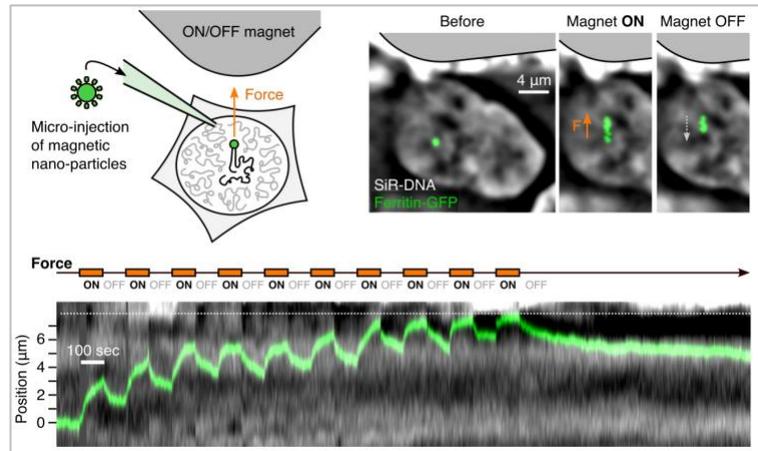


– Postdoctoral position –

# Chromosome mechanics inside living cells

**Location:** Institut Curie, Paris.  
**Position:** Postdoctoral researcher  
**Duration:** 2 years (extendable)  
**Start date:** Ideally, before end of 2022  
**Team website:** [www.coulonlab.org](http://www.coulonlab.org)



The team of Antoine Coulon at Institut Curie is recruiting a **postdoctoral researcher** with a strong background and interest in **interdisciplinary science**.

Our team studies the **physical organization, dynamics and mechanics of chromosomes** in the mammalian nucleus and their relationship with functional genomic processes. We take a quantitative approach at the **physics-biology interface**, combining microscopy, mechanical micro-manipulation, and physical modeling.

We recently developed a **new technology to mechanically micro-manipulate chromosomes in living cells** by exerting a force onto a genomic locus [[Keizer et al. \(2022\) Science, 377:6605](#)].

## Project(s)

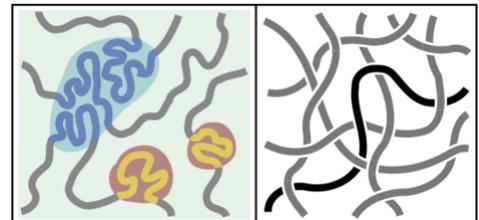
Our first micro-manipulation study revealed a surprisingly fluid-like material state for interphase chromatin, with little constraints from obstacles, affinities and topological effects. — This opens many new questions.

### What are the biological determinants of chromatin mechanics?

How does it depend on chromatin state and topology? on genomic/chromosomal context? on cellular state?

### How do chromosomes deform and reorganize in response to force?

How do they react and adapt biologically? Do their seemingly unconstrained movements in response to force stem from the way they are folded in 3D? or from active biological processes? Can energy-dependent/force-generating biological processes be involved in maintaining homeostasis of chromosome folding?



The selected candidate will use our micro-manipulation technology, in physiological and perturbed conditions, to probe and visualize the physical and biological response of chromosomes to mechanical manipulation, in close collaboration with our theoretical physics collaborators.

## Qualifications

Applicants should hold a PhD in Biology, Physics or Chemistry. Strong interest in genome organization, chromosome biology and quantitative approaches, and prior experience with live fluorescence microscopy and cell biology techniques are important. A good level of programming (Python) is also recommended.

## Context

Institut Curie is an internationally renowned research institution bringing together biologists, physicists, chemists, bioinformaticians and clinicians. It is an inclusive, equal opportunity employer. Our team is part of the **'Nuclear Dynamics'** unit (UMR3664) and the **'Physical Chemistry'** unit (UMR168). Funding will be provided by Labex DEEP, ERC and/or CNRS funds depending on the chosen project.

## Application

Candidates should contact Antoine Coulon at [recruitment@coulonlab.org](mailto:recruitment@coulonlab.org), with their CV, a motivation letter and a list of references, at any time and no later than **September 9, 2022**.