POSTDOCTORAL POSITION IN MOLECULAR BIOPHYSICS AT THE CENTRE DE BIOLOGIE STRUCTURALE, MONTPELLIER, FRANCE

Dr. Emmanuel Margeat
Head of the Integrative Biophysics of Membrane Team

https://integrativebiophysicsofmembranes.wordpress.com/

SCIENTIFIC CONTEXT

The TATA-box Binding Protein (TBP) is universally required for the synthesis of RNA molecules encoded by eukaryotic genes. For RNA polymerase II (Pol II)-dependent genes, the interaction of TBP with the gene promoter initiates the assembly of a transcription Pre-Initiation Complex (PIC) that positions the enzyme over the transcription start site (TSS) in order to start mRNA synthesis. The multi-subunit TFIID and SAGA complexes share the capacity to load TBP onto Pol II gene promoters and enable transcription. However, how SAGA and TFIID deliver TBP to promoters, the kinetics of TBP-DNA interactions and the modes of TBP reloading are not well understood, despite the importance of these events in gene expression.

This project combines the expertise of 3 labs in molecular biology and biochemical assays, yeast genetics, kinetic measurements and structural biology, to address the role of SAGA in activated transcription initiation. The combination of in vitro reconstitution experiments, single particle cryo electron microscopy (cryo-EM) and FRET analysis aims not only at identifying key functional intermediates but also at understanding their dynamic relationships.

MISSION

The postdoctoral researcher joining our team will be in charge of designing and implementing ensemble fluorescence and single molecule (sm)FRET experiments to monitor the conformational changes occurring during TBP release. Experiments include fast mixing fluorescence anisotropy to measure the binding of promoter DNA to the TBP-SAGA complex and the dissociation of SAGA. Correlation with DNA bending will be performed using smFRET.
on doubly labeled DNA introduced in SAGA-TBP complexes. Conformational changes within the complex will also be monitored by measuring distance changes between unnatural amino acids introduced at key positions identified on our CryoEM structures. smFRET measurements will report on the conformational changes occurring within the complex before and during TBP release after addition of unlabeled TFIIA and DNA.

**SCIENTIFIC ENVIRONMENT**

The CBS (http://www.cbs.cnrs.fr) is an institute dedicated to research at the forefront of structural biology and biophysics, with state-of-the-art facilities. Montpellier is a stunning city on the Mediterranean coast with a significant international community. Our research team includes 18 people with 8 permanent researchers. The team has a longstanding record in the training of young apprentices and mentoring young researcher.

More info: https://integrativebiophysicsofmembranes.wordpress.com

**COMPETENCES**

Highly motivated and ambitious candidates are encouraged to apply. We require:
- A recently obtained PhD degree in biochemistry or biophysics.
- A high level of interest in the development of non-conventional protocols and techniques.
- Relevant scientific experience supported by publication record.
- Excellent English communication and teamwork skills.

Previous experience in fluorescence spectroscopy or advanced microscopy, protein engineering and/or biochemistry. Computational skills (i.e. Labview, Matlab, … ) will be positively considered.

**TERMS OF SALARY AND EMPLOYMENT:**

Successful applicants will receive a salary according to CNRS rules

**APPLICATION PROCEDURE:**

The application must be submitted in English to margeat@cbs.cnrs.fr and must include the following:
- Curriculum vitae with a list of publications,
- A report on previous research (1/2 to 1 page)
- The names, addresses and contact details of 2 referees