

## Post-Doc Position

DSIMB-Reunion, Université La Réunion

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### **Context:**

Erythropoietic protoporphyria are rare metabolic diseases characterized by acute neurovisceral attacks and/or skin lesions. In addition to the particularly disabling photosensitivity of the patients, this pathology can lead to severe liver damage. It is due to a genetic defect that leads to the functional alteration of an enzyme, ferrochelatase or FECH. This enzyme leads to the production of an element that is essential for the synthesis of an important blood constituent. To repair this defect, a molecule has been designed and has shown its ability to restore the enzyme's activity in cells from patients. To make a drug, i.e. one that is effective in vivo, it is necessary to deliver this molecule into the targeted cells and therefore to cross the various barriers that are the cell membranes. The OligoPep project aims to develop a "guide" from the molecule to a target, which is itself capable of transferring the drug into the appropriate cell compartment

**Main activities:** Design of peptide sequences targeting the transferrin receptor and being internalised by the receptor.

- -Exploration of the interaction of these peptides with the receptor using docking approaches and molecular dynamics simulations.
- Elucidation of the key residues involved in the dynamics of the receptor.
- Implementation of strategies to optimise the sequence of these peptides in order to increase specificity and transfer efficiency.
- -Development or adaptation of different tools to predict the sequence compatible with the interaction with the receptor, taking into account the experimental data available thanks to the close interdisciplinary collaboration with the different project partners.

### **Main scientific skills and knowledge:**

- Structural bioinformatics
- Statistics and advanced data mining methods.
- Optimisation methods
- Modelling and molecular simulation tools (normal mode analysis, molecular dynamics, docking and virtual screening, QSAR model etc.)
- Programming language (python or C or Fortran).
- Oral and written English.

### **Soft skills :**

- Enjoying working in a team and in close collaboration with biologists.
- Sharing skills and contributing to the training of trainees.
- Autonomous, rigorous.