

Post-doctoral proposal funding by AMIDEX
**Mathematical modeling of Microtubule
dynamic instability : the role of EB1
protein**

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<http://amidex.univ-amu.fr>

Scientific background

Molecular modeling and computer simulation techniques have matured significantly over the past years and proved their value in the study of protein-protein interactions and drug-protein. Evolution in this area has gone hand-in-hand with an increased availability of structural and functional data on biological macromolecules. The information derived from molecular simulations of drug-receptor complexes can be used to extract structural and energetic information. Such information is usually beyond current experimental possibilities, provide independent accounts of experimentally observed behavior, help in the interpretation of biochemical or pharmacological results, and open new avenues for research by posing novel relevant questions that can guide the design of new experiments. Mathematical and Computational modification of biological/pharmacological processes required thus the daily joined competences of both biologists and mathematicians.

Description

In this one year post-doctoral position (possibilities of one extra-year), we aim to design in collaboration with the group of Stéphane Honoré (CRO2 laboratory <http://www.cro2-timone.fr>) some pertinent mathematical /computational models of the pharmacological effects of microtubule-targeted drugs, which are powerful anti-mitotic drugs used in human cancers, on microtubule dynamic instability. This process play a key role in cancer progression: i.e cell proliferation/division and cell migration. We will focus on the action of the protein EB1 on this dynamics. The post-doctoral position will be hosted in the "Institut de Mathématique de Marseille" <http://www.i2m.univ-amu.fr>, FRANCE.

Required competences

We are looking for a foreign student with knowledges in scientific computing/programming and partial or stochastic differential equations. He will be asked to collaborate with the group of Stéphane Honoré, biologists/pharmacologists.