Master « Sciences, Technologie, Santé »
Mention « In Silico Drug Design »
Second Year

OFFER AN INTERNSHIP
Academic Year 2012 – 2013

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Name of the head of laboratory or company: Prof. T. Hackeng

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Specialty training : Research ☒ Professional ☐

a few key words to describe the subject of training : structural bioinformatics – virtual screening - hit identification - lead optimization - direct binding analysis

Title of internship: Targetting of Annexin A5 through structure-based virtual ligand screening.

this subject is a first step towards a thesis: Yes - No

Short texte describing your project

Annexin A5, discovered in our laboratory as vascular anticoagulant protein (VAC), is a protein that is present in human blood and that has many functions. Though discovered as an anticoagulant protein, currently Annexin A5 is believed to be mainly important for cellular processes such as apoptosis and necrosis. We are using biotechnological techniques to use Annexin in theragnositcs of cardiovascular disease as well as in novel cancer treatments. Since endogenous Annexin has functions in cell-signalling, this also makes it an attractive target for novel pharmacological therapies, which are facilitated by a number of high resolution crystal strucures as well as the detailed mechanistical information on the functions of the protein.

In this project we aim to discover and optimize small molecules or peptides that inhibit the cellular functions of Annexin A5 through a structural bioinformatics approach. A first phase of the project has been completed and small molecules are currently being tested for functional activity. Based on these results, molecule optimization and repeated characterization will follow. In this project we will use a combination of virtual screening, molecular docking, MD simulation and binding free energy calculation to discover and optimize small molecules. Depending on skills and interests, the potential candidate will be involved in the wet lab screening, including cell-based assay, fluorescence assays, ITC and SPR as well as in the *in silico* part of this study.