



## PhD Program between the Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

### Open PhD position at FUB for CSC scholarship candidates 2016

*Please note: the PhD position is only offered to Chinese PhD candidates for application in the framework of the FUB-CSC PhD Program.*

<b><u>Department/Institute:</u></b>	Department of Mathematics and Computer Science, Institute of Computer Science & Institute of Bioinformatics
<b><u>Subject area:</u></b>	Medical Bioinformatics
<b><u>Name of Supervisor:</u></b>	Prof. Dr. Rosario M. PIRO (Mr.)
<b><u>Number of open PhD positions:</u></b>	1
<b><u>Type of the PhD Study:</u></b>	Full-time
<b><u>Project title:</u></b>	Study of the relationship between topological association domains (TADs) and the conservation of co-expression; evaluation of its relevance for medical bioinformatics (e.g. for disease gene prediction).

#### **PhD Project description:**

"Topological association domains" (TADs) have recently been described as a layer of organization of mammalian genomes. Indeed, they constitute "chromosome neighborhoods" in which the majority of interactions between enhancers and promoters occur and are thus very important for understanding regulatory mechanisms of gene expression.

The purpose of this project is to better understand the relationship between these TADs and the conservation or loss of co-expression of pairs of genes over evolutionary distances. The question is whether two genes which remain in the same TAD during evolution also tend to have evolutionarily conserved co-expression patterns. And at the same time, whether two genes which lose their co-occurrence in the same TAD tend to have discordant expression patterns.

Since it has been shown that conserved co-expression can be helpful for functional predictions and thus indirectly for disease gene prediction, the project will further explore whether the relationship between co-occurrence in the same TAD and conserved co-expression can be exploited for computational medicine, e.g. to further improve disease gene predictions or elucidate disease mechanisms that affect enhancer-mediated gene regulation and maybe the identification of appropriate model organisms for their study.

**Language requirements:**

Very good knowledge in English is required. The doctoral thesis can be written in English. German is helpful, but no requirement.

**Academic requirements:**

Applicants should have a degree in bioinformatics/computational biology or highly related field. Alternatively, exceptional candidates from mathematics, computer science or physics might be considered, if they have sufficient knowledge in programming languages and a previous familiarity with applications to biological research topics.

**Information of the professor or research group leader:**

Rosario M. Piro has recently been appointed assistant professor in bioinformatics and principal investigator at the Institute of Bioinformatics and the Institute of Computer Science at FU Berlin. At the same time he's a member of the Institute of Human Genetics and Medical Genetics at the Charité University Hospital.

His research concentrates on computational neuropathology (i.e. computational approaches to study neurological disorders and neuropathologies, including brain tumors) and computational oncology in general (including the development and evolution of cancers in other organs or tissues).

Website: <http://rmpiro.net>

**Please note:**

In a first step the complete application should submit to the Beijing Office for evaluation by January 4<sup>th</sup>, 2016. Please don't contact the professor before. He/She will get in contact with you after having received the complete application in January.