PhD student: A systems analysis of rodent animal models of human disease

Function title	PhD student
Where	Bioinformatics Laboratory, Academic Medical Center, Amsterdam
Apply before	July 15, 2009

Project

Model organisms have been essential for improving our knowledge of human disease. Especially rodents, mainly mouse and rat, are often used for this purpose, as well as for pre-clinical trials of new drugs and toxicology screens. However, often animal models fail to mimic human disease adequately. As a consequence drugs successfully tested in animal models fail in costly clinical trials or are falsely discarded. Goal of this project is to explore the suitability of rodents as a model organism for human disease, specifically metabolic syndrome. Since metabolic syndrome is a complex multifactorial group of metabolic conditions, a systems approach will be taken to uncover the molecular networks perturbed by disease. Specifically, we aim to validate the similarity of a large number of rodent models for metabolic syndrome to their human counterparts. The project is tightly linked to ongoing projects in biological and clinical groups at the AMC. This project is part of the second round of the BioRange programme of the Netherlands Bioinformatics Centre (NBIC; www.nbic.nl).

Tasks

The successful candidate will work towards a PhD degree in bioinformatics. We will build a compendium of rodent and human metabolic syndrome related gene expression datasets. We develop module-based joint analysis methods that search for conserved patterns consisting of sets of genes and sets of conditions in both rodent model and human under which they are co-expressed. These patterns are used to evaluate the molecular similarity of rodent models and their human counterpart. Conserved patterns will be further interpreted by constructing functional networks for metabolic syndrome in rodents and human. We expect methods developed and resulting conserved patterns and functional networks to be useful for elucidating the model mismatch and for increasing the predictive value of preclinical trials and toxicity screens.

Requirements

We are looking for an enthusiastic communicative team player with

- a MSc in one of the following areas: bioinformatics, computer science, engineering, statistics, physics, plus a proven interest in biology
- strong background in computer science (machine learning, graph algorithms, relational databases)
- good programming knowledge (R, C/Java/C++, SQL)

Additional conditions of employment:
The appointment will be on temporary basis for a maximum period of four years. Based on a full-time appointment (36 hours per week), compensation will be according to standard salary levels for PhD students starting with a salary of € 2046,- with a yearly growth to € 2622,- gross a month. The collective employment agreement of the AMC is applicable.

Additional information about the vacancy can be obtained from:
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www.bioinformaticslaboratory.nl

Contact: Applications should include a detailed curriculum vitae and a letter of motivation, and be sent to:

AMC Medical Research BV.
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