Post Doc in Genome-scale Modeling and Omics Analysis

The Systems Biology Research Group (SBRG) at the University of California San Diego is seeking a Post-Doctoral Scholar to elucidate mechanisms of *E. coli*'s response to various physicochemical stresses by analyzing multiple omics data types (genomics, mutations, transcriptomics, physiological) using genome-scale computational modeling and statistical analysis.

The projects will involve advancing and generating new genome-scale models of metabolism and protein expression, and using these models to analyze omics data from evolved and wild-type strains of *Escherichia coli* under a number of stress conditions (e.g., thermal and oxidative stress). The scholar will work closely with wet-lab researchers in the SBRG and help in designing experiments for data generation and model validation.

Qualifications

Candidates should be trained in constraint-based modeling of cell metabolism. In particular, experience in mathematically extending flux balance analysis models to account for additional biological mechanisms by incorporating additional constraints, will be critical. Candidates should also be familiar with processing omics data sets, including DNA and RNA sequencing, and have skills associated with bioinformatics analysis for statistical interpretation of such data sets. Domain expertise on microbial stress response is a plus.

The preferred candidate has experience with:

- Developing algorithms to extend constraint-based models
- Formulating and solving nonlinear programming problems (convex or nonconvex)
- Unsupervised and supervised machine learning
- Genome-scale models of metabolism and macromolecular constraints (e.g., molecular crowding, protein expression pathways, resource balance analysis)
- Analysis of omics data, including RNA-Seq, proteomics, fluxomics, and metabolomics

Additionally, the candidate must have:
- Proficiency in programming languages, such as Python, MATLAB, R, GAMS/AMPL, Fortran, C/C++
- Detailed understanding of mathematical optimization
- Proficiency in applying appropriate statistics in the context of omics data and model validation
- Ability to efficiently communicate with other members of an international research team in English

If you are interested please contact Bernhard Palsson (palsson@ucsd.edu) or Laurence Yang (lyang@eng.ucsd.edu), directly with your CV.