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Postdoctoral Fellow in bacterial whole-cell modeling

The Karr lab in the Institute for Genomics & Multiscale Biology at the Icahn School of Medicine at Mount Sinai is seeking talented, ambitious individuals to help develop cutting-edge dynamical models of human and bacterial cells. Despite the explosion of experimental data, we do not understand the details of how phenotype arises from genotype. We are developing whole-cell computational models which comprehensively predict how cell behavior emerges from the molecular level by representing all of the biochemical activity inside cells. Our goal is to use whole-cell models to transform bioengineering and medicine. For example, we believe that whole-cell models could enable bioengineers to design microorganisms for a variety of industrial applications, as well as enable physicians to tailor medical therapy to individual patients. Our research is highly interdisciplinary, involving systems biology, genomics, numerical simulation, and software engineering, and highly team-oriented.

Responsibilities. The Postdoctoral Fellow will lead the development a whole-cell model of the bacterium *Mycoplasma pneumoniae* and use the model to design more predictable, fast-growing, non-virulent chassis for future bioengineering such as a bacterial-based drug synthesis and delivery system. This includes expanding the scope of whole-cell models; improving their accuracy; using new types of genomic data to train whole-cell models; systemizing the construction, representation, and simulation of whole-cell models; and developing new methods to use whole-cell models to design genomes. The Postdoctoral Fellow will work closely with our team at Mount Sinai, as well as our Minicell consortium experimental collaborators: Maria Lluch-Senar and Luis Serrano in Spain; Alain Blanchard in France; and Jörg Stülke in Germany.

Desired skills/experience. Whole-cell modeling is a highly interdisciplinary problem. Consequently, we are looking for a broad range of skills and experience. The ideal candidate has the following skills. Applicants with related experience are also encouraged to apply.

- PhD in computational biology or related field;
- Strong experience in dynamical and/or genome-scale modeling;
- Broad knowledge of cell biology, genomics, mathematics, and computer programming;
- Deep commitment to innovation and desire to tackle the most challenging problems;
- Abilities to solve problems by thinking creatively, integrating concepts, and overcoming barriers;
- Passion for transforming bioengineering and medicine;
- Excellent oral and written communication skills; and
- Abilities to work independently and within a team.

Funding & duration. This position is supported by a three-year NSF/ERASynBio award.

Career development, compensation & benefits. The Karr Lab and Mount Sinai offer numerous opportunities for career development. Compensation will be commensurate with experience and education. All employees are eligible for medical, dental, and health insurance.

How to apply. Please send a cover letter indicating your research and career goals and a CV to Jonathan Karr (karr@mssm.edu).

More information. Please visit our website (www.karrlab.org) or contact Jonathan Karr (karr@mssm.edu).

About the Institute for Genomics & Multiscale Biology. The Institute for Genomics & Multiscale Biology is an interdisciplinary group of scientists, engineers, and clinicians who are passionate about making medicine more precise and personalized. The Institute's research spans a wide range of systems biology, genomics, bioinformatics, and clinical informatics. Mount Sinai is a leader in basic and clinical research.