

## Postdoctoral Fellow Positions

### Systems Medicine and Personalized Cancer Therapy

Multiple postdoctoral positions in Systems Medicine are available in the lab of Prof Su-In Lee in the Departments of Computer Science & Engineering and Genome Sciences at the University of Washington in Seattle. The growing availability of various types of high-throughput biological data from individuals promises to provide a comprehensive understanding of disease causation and therapeutic strategies. However, the high-dimensional data that enable this approach also present daunting statistical challenges involving multiple hypothesis testing, making it hard to identify relevant signals against a noisy background. We have addressed this issue by developing computational approaches that integrate prior knowledge from biology and medicine with advanced machine learning algorithms to identify genetic/ environmental factors of diseases, reveal the underlying mechanisms and develop personalized therapies.

Specific Fellowship projects available now include:

- **Personalized treatment of cancer**

The goals of this collaborative project are (1) to build predictive models of the drug responsiveness of Acute Myeloid Leukemia (AML) based on molecular profiles including RNA expression and high-throughput drug screening data for AML patients; and (2) use these models to determine the molecular basis of sensitivity to current and potentially new chemotherapeutic agents identified in high throughput screens of 50,000 small molecule libraries. These analyses make full use of the well-developed infrastructure for both AML/leukemia research and bone marrow transplantation in Seattle, and aim to identify and develop new drugs to improve the treatment of AML and other cancers. This project will be co-mentored by Prof. Lee and by Profs Tony Blau (UW Medicine) and Ray Monnat (UW Pathology and Genome Sciences). There will also be ample opportunity to collaborate with the world-class clinical oncology service at the Fred Hutchinson Cancer Center.

- **Understanding the genetic basis of metabolic traits and cardiovascular diseases**

The goal of this project is to use various types of genomic information to develop a sophisticated mechanistic model of metabolic syndrome and related diseases. Our proposed computational frameworks will use advanced machine learning techniques that can extract testable biological hypothesis from many heterogeneous genomic datasets, with the goal of providing mechanistic explanation of genome-wide association. This project will be co-mentored by Prof Lee and Profs Steve Schwartz (UW Pathology) and Alex Reiner (Epidemiology).

These collaborative projects are being conducted in an excellent environment in which to learn and integrate clinical and computational approaches to human disease. Both major projects will provide an opportunity to develop a working knowledge of Systems Medicine and specific projects with collaborators in the Departments of Genome Sciences, Medicine, Epidemiology, Pathology, Seattle Children's Hospital, and the Fred Hutchinson Cancer Center. This tight collaborative network facilitates access to primary data, and experimental and clinical settings in

which to validate and extend new hypotheses generated by our research. For more information including active research projects in the lab and contact information, please visit our lab project website:

<http://www.cs.washington.edu/homes/suinlee/projects.html>

Competitive candidates will have received a PhD in computer science, statistics, biostatistics, bioengineering, genetics, quantitative biology, or a related field with strong computational background. A strong background in machine learning, statistics, and experience in analyzing large-scale genomic datasets are a strong plus. For a candidate with an exceptionally strong computational background, it is not essential to have experience with biological problems.

To apply, please email Prof Lee ([suinlee@uw.edu](mailto:suinlee@uw.edu)) your updated CV, including a publication list and names of at least three references, with the subject line 'Post-doctoral Fellowship Application'.

**Representative publications from Prof Lee's work on individual variation in gene regulation and effects on disease phenotypes**

1. Gentles, A.J. et al. A pluripotency signature predicts histologic transformation and influences survival in follicular lymphoma patients. *Blood* **114**, 3158-66 (2009).
2. Lee, S.I. et al. Learning a prior on regulatory potential from eQTL data. *PLoS Genet* **5**, e1000358 (2009).
3. Lee, S.I., Pe'er, D., Dudley, A.M., Church, G.M. & Koller, D. Identifying regulatory mechanisms using individual variation reveals key role for chromatin modification. *Proc Natl Acad Sci U S A* **103**, 14062-7 (2006).