



## Rice University

### Postdoctoral Position in Bioinformatics and Computational Immunology

The Kaviraki Lab at Rice University (<http://www.kavirakilab.org>) is seeking candidates to fill one postdoctoral position. The topic of the research relates to the development of computational methods to support novel cancer therapies and, in particular, personalized cancer immunotherapies.

Developing effective cancer treatments remains one of the most important challenges for healthcare, and T-cell based immunotherapy has provided some very positive recent advances in cancer treatment. Cytotoxic T lymphocytes (CTLs) can circulate through the body and are capable of identifying and eliminating tumorigenic cells. The recognition of tumor depends on the specific interaction between the T-cell receptor of CTLs, and class I Human Leucocyte Antigen (HLA) receptors. HLA receptors bind peptides derived from intracellular proteins, and display them at the cell surface. These peptide-HLA complexes are present at the surface of virtually all nucleated cells, constituting an efficient surveillance mechanism by which the immune system can recognize aberrant changes within cells of the body. Although CTL surveillance likely evolved to eliminate virally-infected cells, this system now provides very promising opportunities for cancer treatment and specifically the development of immune-based therapies. The understanding of peptide-HLA interactions at scale presents a formidable problem and computational analysis has a huge role to play. The overall goal of our research is to develop novel algorithmic methodologies for the modeling and analysis of peptide-HLAs, and its recognition by CTLs, implementing these methodologies in toolkits that can be used by immunologists. Most of our research deals with structural methods but we do complement our analyses with sequence methods.

The individual recruited to fill this position will be working closely with collaborators at the MD Anderson Cancer Center and other researchers at the Texas Medical Center, the largest medical complex in the world.

**BACKGROUND:** Applicants must hold a Ph.D. in Computer Science, Bioinformatics, Biomedical Informatics, or a related field. Prior knowledge of immunology is not required, but it is desirable. Familiarity with bioinformatics databases and tools is also desirable. Applicants with Ph.D.s in the Biological Sciences will be considered if they have expertise in immunology and good computational skills. They must be willing to train in computer science. This position is particularly suited for candidates who want to follow a career in

academia; the position can include formal training for obtaining and succeeding in an academic position, if the candidate desires so.

**DURATION:** Postdoctoral fellows are eligible for up to two years of support. All re-appointments are dependent upon a satisfactory progress review and continued funding.

**ABOUT RICE UNIVERSITY:** As a leading research university with a distinctive commitment to undergraduate education, Rice University (<http://www.rice.edu>) aspires to path breaking research, unsurpassed teaching, and contributions to the betterment of our world. It seeks to fulfill this mission by cultivating a diverse community of learning and discovery that produces leaders across the spectrum of human endeavor. Rice University, an equal opportunity employer and a Tier 1 Research University, is located in the vibrant urban setting of Houston, TX, the fourth largest city in the U.S. Rice is ranked No. 15 by Forbes, among the top research universities, and No. 16 on their list of 50 Best U.S. colleges for international students.

**ABOUT THE LAB:** The Kavraki Lab (<http://www.kavrakilab.org>) develops computational methods and tools to model protein structure and function, understand biomolecular interactions, aid the process of medicinal drug discovery, analyze the molecular machinery of the cell, and help integrate biological and biomedical data for improving human health. We employ computational techniques that range from robotics-inspired algorithms to machine learning and data science, and we work closely with researchers at the Texas Medical Center. The Lab provides a stimulating working environment and has excellent record placing postdocs in faculty positions. The Computer Science Department at Rice University is part of the Gulf Coast Consortia for Quantitative Biomedical Sciences (<http://www.gulfcoastconsortia.org>), and offers an unparalleled training environment.

Interested applicants should contact Professor Lydia Kavraki ([kavraki@rice.edu](mailto:kavraki@rice.edu)) and provide a CV and a one paragraph statement about their interest in the advertised position. Please include the names of at least three references in the CV.

The position is available immediately.