



Tenure-Track Faculty Position – Quantitative Immunology

The Department of Biostatistics and Bioinformatics at Duke University has a tenure track position open for a new faculty member with expertise in quantitative aspects of immunology. Joint appointments with other Departments at Duke are encouraged where appropriate and possible intersections indicated in the priority focus areas listed below:

Immunogenomics [B&B, DSS]. Modeling immune response genes differs from standard statistical genomics because of the need to incorporate extremely high polymorphism (HLA, KIR or FcR) or recombination and junctional insertion events (TCR, BCR). Modeling immune response genetics/genomics correctly is foundational to precision immunotherapy.

Complex immunological assays [B&B, DSS]. Immunological assays such as single cell analysis or antigen receptor sequencing often require specialized statistical models and/or bioinformatics pipelines, and an understanding of immunology to interpret correctly. In particular, there is a need for expertise to integrate across multiple assay modalities that provide different perspectives of the immune response.

Causal inference in immunology [B&B, DSS]. To understand immune control, we need to go beyond statistical association to determine if an immune variable is a confounder, mediator or moderator. Hence, there is a need for expertise in causal inference and graphical models applied to immunology.

Modeling immune dynamics [B&B, Math, CS]. The ability to construct mathematical models of immune system dynamics and/or perform computer simulations of in-silico models is essential for understanding mechanisms in immune control and generating new mechanistic hypotheses.

Immune profiling and predictive modeling [B&B, DSS, CS, BME]. There is tremendous scope for advanced classical/deep machine learning based on complex immune profiling data to predict patient outcomes. Given the complexity of the data sets, there is a need for machine learning theorist who also understands immunology to develop interpretable models.

The faculty will be a core member of the new Duke Center for Human Systems Immunology created to facilitate interdisciplinary methods and collaborative research between immunology researchers and methodologists. In addition to development of new methods and/or models, there are abundant opportunities to collaborate with the extensive network of researchers performing basic, translational and clinical research in immunology at Duke. The new faculty member would also be expected to engage in developing new research programs that contribute to the growth of the center, and to participate in training and educational activities of the department and center.

Applicants should hold a Ph.D. in Computer Science, Computer Engineering, Mathematics, Statistics, Biomedical Informatics, Bioinformatics, or a related field by the date of the start of their appointment. Joint appointments with other departments are possible for appropriate candidates. Particular attractions of this position include the exceptional data and translational opportunities of Duke Health and the School of Medicine, the campus-wide emphasis on artificial intelligence for health as exemplified by the new AI Health Initiative, and the opportunity for a one-course-per-year teaching load for candidates who want to focus their efforts on algorithmic, theoretical, and/or methodological research with the potential to transform health and healthcare nationwide and around the world.

The Department of Biostatistics and Bioinformatics has Masters and PhD programs, and our methods-oriented faculty also supervise PhD students in other leading programs on campus. Duke has an exceptional history in healthcare innovation, and Durham and the Research Triangle form a vibrant community with an outstanding climate intellectually, culturally, and for year-round physical activity and recreation.

Application review will begin January 1, 2020 and continue until all positions are filled. Applicants are invited to submit application materials via Academic Jobs Online at <https://academicjobsonline.org/ajo/jobs/15536>. Please upload a CV, research statement, and teaching statement, and request at least three references to upload letters of recommendation.

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