

Cytokine Gene Regulation and Cytokine Biology in CNS

Position Description:

The laboratory of Dr. Han-Yu Shih at the National Institutes of Health (NIH) in Bethesda, MD is seeking a motivated and talented postdoctoral researcher to join our multidisciplinary team. Our lab focuses on understanding the mechanisms that precisely regulate gene expression in lymphoid cells, with a particular interest in homeostasis and CNS inflammation. We use cutting-edge genomic approaches to address three fundamental questions:

1. How do transcription factors modulate chromatin landscapes during lymphoid cell development and activation?
2. How do cytokines and their producers contribute to the progression of neurodegenerative and neuroinflammatory diseases, such as Alzheimer's disease?
3. How does crosstalk between neural and immune cells control autoimmune diseases in CNS?

The successful candidate will use "omic" approaches to investigate immunoregulation and identify potential therapeutic targets. You will have the opportunity to lead and co-lead projects, design experiments for generating high-dimensional data (single cell transcriptomes and epigenomes, spatial transcriptomes, TCR/BCR repertoires), and work closely with collaborators and lab members. Additionally, you will receive training in bioinformatics and have opportunities to mentor postbacs or summer students. will be available based on interest. Salary is commensurate with research experience and accomplishments.

Selected publications:

1. Fernando N, Gopalakrishnan J, Behensky A, Reich L, Liu C, Bass V, Bono M, Montgomery W, De Pace R, Mattapallil M, Nagarajan V, Brooks SR, Maric D, Caspi RR, McGavern DB, Shih HY. Single-cell multiomic analysis reveals the involvement of Type I interferon-responsive CD8+ T cells in amyloid beta-associated memory loss. <https://doi.org/10.1101/2023.03.18.533293>
2. Liu C, Nagashima H, Fernando N, Signorella S, Montgomery W, Lim AI, Harrison O, Bass V, Reich L, Yao C, Sun HW, Brooks SR, Jiang K, Nagarajan V, Phillips R, Mikami Y, Lareau CA, Kanno Y, Jankovic D, Aryee M, Pekowska A, Belkaid Y, O'Shea JJ, Shih HY. Differential Requirement of 3D Genomic Organization for the *Mdm1-Il22-Ifng* Locus Regulation in Adaptive Versus Innate Responses. <http://dx.doi.org/10.2139/ssrn.4271102>
3. Sciumè G, Mikami Y, Jankovic D, Nagashima H, Villarino AV, Morrison T, Yao C, Signorella S, Sun HW, Brooks SR, Fang D, Sartorelli V, Nakayamada S, Hirahara K, Zitti B, Davis FP, Kanno Y, O'Shea JJ, Shih HY. Rapid enhancer landscape remodeling and transcription factor repurposing enable high magnitude gene induction upon acute activation of NK cells. *Immunity*. 2020 PMID: [33010223](https://pubmed.ncbi.nlm.nih.gov/33010223/)
4. Fernando N, Sciumè G, O'Shea JJ, Shih HY. Multi-dimensional gene regulation in innate and adaptive lymphocytes: A view from regulomes. *Frontiers in Immunology* 2021. PMID: [33841440](https://pubmed.ncbi.nlm.nih.gov/33841440/)
5. Shih HY, Sciumè G, Mikami Y, Guo L, Sun HW, Brooks S, Urban J, Davis F, Kanno Y, O'Shea JJ. Developmental acquisition of regulomes underlies innate lymphoid cell functionality. *Cell*. 2016 PMID: [27156451](https://pubmed.ncbi.nlm.nih.gov/27156451/)

Qualifications:

- Candidates must hold a Ph.D. or M.D./Ph.D. in immunology, neuroscience, genetics, molecular biology, biochemistry, computational biology or a related field, within three years of degree being awarded;
- Must have first authorship on at least one peer-reviewed publication;
- Must be self-motivated and keen to develop and/or learn cutting-edge technologies and/or up-to-date genomic data analysis;
- Experience in animal experiments, or NGS data analysis are preferred;
- The ability to work as part of a cohesive group is important as we are a highly collaborative lab;

To Apply:

Interested candidates please send a cover letter, curriculum vitae, and contact information of three references to: NEI Shih Lab han-yu.shih@nih.gov

Lab website:

<https://www.nei.nih.gov/research/research-labs-and-branches/neuro-immune-regulome-unit>

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