

UC Davis

2026 Postdoctoral Research Symposium

Title

Early-life immune landscape shapes cognition across the lifespan in rhesus macaques

Permalink

<https://escholarship.org/uc/item/8k75q16t>

Journal

Book of Abstracts from the UC Davis Postdoctoral Scholars Association 2026 Postdoctoral Research Symposium

Author

Chakraborty, Bidisha, PhD

Publication Date

2026-04-24

Peer reviewed

Early-life immune landscape shapes cognition across the lifespan in rhesus macaques

B. Chakraborty^{1*}, A. Cruz¹, L. Cenicer¹, A. Cunningham¹, R. Subedi¹, A. Brown¹, E. L. Kinnally¹

¹California National Primate Research Center (CNPRC), University of California, Davis

Abstract:

We investigated whether infant immune organization predicts cognitive trajectories across the lifespan in rhesus macaques (*Macaca mulatta*). Cognition was measured using Preferential Looking (PL), which quantifies working memory via novelty preference, and a Visual Prediction (VP) task, which assesses spatial memory by testing gaze to a withheld final stimulus location after repeated spatial presentations. In a large cohort (n = 4090) at CNPRC, immune markers collected at 3-4 months were matched with concurrent cognition. Higher CD4⁺ counts predicted increased novelty preference ($p < 0.01$), whereas elevated CD8⁺ counts predicted poorer performance ($p < 0.01$). We re-tested a subset of the same animals (n=40-50) in later life (15–21 years). In the PL task, higher infant CD8⁺ T cells and neutrophils predicted poorer late-life memory ($p < 0.05$), whereas infant lymphocytes were positively associated ($p < 0.04$), and glucocorticoids were negatively associated ($p < 0.05$) with VP performance. These findings indicate that early immune and endocrine profiles become biologically embedded, shaping cognitive function across life.

Contact Information for Presenting Author: bchakraborty@ucdavis.edu