

Postdoctoral Fellow in Large Language Models and Behavioral Digital Twins
Division of Infectious Diseases and Global Public Health
University of California San Diego (UCSD)

The position is for a postdoctoral fellowship to join an innovative, multi-disciplinary research team funded by a prestigious **NIH Director's Avant-Garde Award** (<https://today.ucsd.edu/story/uc-san-diego-researcher-wins-5.6m-nih-avant-garde-award-to-prevent-hiv-hepatitis-c-and-overdose>). Dr. Natasha Martin (<https://profiles.ucsd.edu/natasha.martin>) leads the project, with additional mentorship from faculty specializing in biostatistics, infectious diseases, and epidemiology. The project aims to revolutionize HIV and hepatitis C virus (HCV) prevention and resource allocation for people who use drugs (PWUD) across the United States. The project will pioneer the integration of large language models (LLMs) to create behavioral "digital twins," embedded within dynamic epidemic and economic simulation models to guide real-world public health policy.

The Division of Infectious Diseases and Global Public Health (IDGPH) at UCSD is in the Department of Medicine in the School of Medicine of the University of California San Diego (<https://idgph.ucsd.edu/>). IDGPH is a multidisciplinary center that includes faculty, postdocs, and graduate students from Epidemiology, Social Sciences, Biostatistics, Medicine, and other disciplines. IDGPH aims to eliminate the burdens of infectious diseases and health disparities by delivering outstanding patient care, conducting world-class multidisciplinary health research, directing the institutional response to antimicrobial resistance, preventable healthcare associated infections, and emerging pathogens, and offering leadership, consultation and training on global public health, equity, microbiology, and infectious diseases topics.

Position Title: Postdoctoral Fellow

Duties and Responsibilities: The postdoctoral fellow will develop, fine-tune, and evaluate large language model-based methods to predict the preferences and likely choices of people who use drugs regarding HIV, hepatitis C, overdose prevention, and substance use services. Using mixed qualitative and quantitative participant data, the fellow will create and validate individual-level behavioral "digital twins" that can generate realistic responses to questions about intervention preferences, such as willingness to use long-acting injectable pre-exposure prophylaxis, hepatitis C testing and treatment services, naloxone, syringe services, or medications for opioid use disorder. Responsibilities will include data preparation and integration, prompt design and model adaptation, development of reproducible computational pipelines, and rigorous evaluation of predictive accuracy, calibration, reliability, and performance across participant subgroups. The fellow will work closely with an interdisciplinary team spanning artificial intelligence, biostatistics, epidemiology, infectious diseases, and substance use research, contribute to manuscripts and conference presentations, and help advance responsible and transparent applications of LLMs in research involving people who use drugs.

Position Qualifications: Candidates should have a doctoral degree in computer science, biostatistics, epidemiology, or a related field. Strong computational skills and expertise in either AI or machine learning. Start date and term are negotiable.

Position Instructions: Applicants should submit a cover letter, CV, and contact information for three references to Matthew Rivera (mnr001@health.ucsd.edu).