Johns Hopkins CEIRR (JH-CEIRR)

The JH-CEIRR Center, funded by NIAID, operates a research pipeline integrating respiratory virus surveillance, virus isolation and characterization, immunological responses to vaccination and infection, and disease diagnostics development. These scientific, clinical, and public health analyses inform local, national, and global pandemic preparedness and response efforts for influenza and other emerging viral threats.

JOHNS HOPKINS
CENTER OF EXCELLENCE FOR INFLUENZA RESEARCH AND RESPONSE

Virus Surveillance and Isolation

- Surveilling and isolating influenza viruses
- Sequencing viral genomes and downstream bioinformatic analyses
- Characterizing human and animal influenza isolates for risk assessment

Antigenic Evolution and Fitness

- Characterizing replication fitness and antigenic drift of influenza virus isolates
- Generating phylogenetic trees from viral sequences
- Identifying antigenic drift, reassortments, and novel mutations

Variations in Immune Response

- Identifying age and sex differences in immune responses to vaccination and infection
- Using animal models to test hypotheses generated from human immune response data
- Clarifying the impact of vaccination on viral load and disease severity

Computational Analysis of Disease

- Developing a database of clinical flu infections and vaccinations
- Using artificial intelligence (AI) and machine learning (ML) to study host factors affecting disease severity and immune responses
- Improving diagnostics for real-time, targeted responses to infection or risk

Publication Highlights

Effect of human H3N2 influenza virus reassortment on influenza incidence and severity during the 2017-18 influenza season in the USA: a retrospective observational genomic analysis.
PMID 38734029

Greater Breadth of Vaccine-Induced Immunity in Females than Males Is Mediated by Increased Antibody Diversity in Germinal Center B Cells.
PMID 35856618

Center Overview

Principal Investigators:

- Andrew Pekosz, Ph.D.
  Johns Hopkins University
- Richard Rothman, M.D., Ph.D.
  Johns Hopkins University

15+	10+	35+
Investigators	Institutions	Publications

1800+
Human Surveillance Samples

Data for metrics collected through November 2025. Click here to view all JH-CEIRR Publications.

CEIRR iDPCC | 2014-2025

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