Contribution ID: **506** Type: **Oral presentation**

Zoonotic MPXV Clades Outpace Human-adapted Strain in Driving Disease and Shedding in a Nasal Respiratory-Infection Macaque model

Wednesday, October 7, 2026 10:00 AM (15 minutes)

MPXV comparative biology after mucosal exposure remains unclear. We compared clades Ia (Zaire and Republic of Congo isolates), IIa, and IIb in a cynomolgus macaque respiratory infection model to assess disease, viral shedding, and immune responses. Mucosal infection caused milder, more localized disease than high-dose aerosol or intravenous models. Clade Ia (Zaire) and IIa produced stronger clinical symptoms and systemic immune activation, while clade IIb resulted in minimal illness and limited spread. Viral genomes persisted in skin lesions at later stages without evidence of active replication, suggesting tissue damage rather than long-term reservoirs. Presymptomatic shedding occurred across all clades, indicating potential transmission before lesion onset. However, clade IIb showed reduced shedding, with little to no oral or rectal virus detection. Clade IIb triggered the strongest dendritic cell activation, whereas clade Ia (Zaire) induced proliferating but functionally impaired antigen-presenting cells and weaker T-cell priming. Natural killer cell responses followed a similar pattern, with clade Ia (Zaire) showing weaker activation compared to other clades. A biomarker panel based on monocyte/eosinophil dynamics and cytokine ratios effectively distinguished clade IIb infections. These findings underscore the importance of clade-specific analysis for outbreak preparedness and One Health surveillance. Funding: intramural NIAID/NIH and INF of the Helmholtz Association.

Keywords

Mpox, MPXV, transmission, NK cells, APCs, immunopathogenesis

Registration ID

OHS26-190

Professional Status of the Speaker

Professor

Junior Scientist Status

No, I am not a Junior Scientist.

Author: Prof. PORT, Julia R. (Laboratory of Transmission Immunology, Helmholtz Center for Infection Research, Braunschweig, Germany)

Co-authors: Mr BUSHMAKER, Trenton (Laboratory of Virology, Division of Intramural Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Hamilton, MT, USA); Dr KAISER, Franziska K. (Laboratory of Virology, Division of Intramural Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Hamilton, MT, USA); FELDMANN, Heinz (Laboratory of Virology, Division of Intramural Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Hamilton, MT, USA); ROSENKE, Kyle (Laboratory of Virology, Division of Intramural Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Hamilton, MT, USA)

Presenter: Prof. PORT, Julia R. (Laboratory of Transmission Immunology, Helmholtz Center for Infection Research, Braunschweig, Germany)

Session Classification: Session 11: Vaccines & Immunology

Track Classification: Vaccines & Immunology