A gammaherpesvirus licenses CD8+ T cells to protect the host from pneumovirus-induced immunopathologies

---

Human respiratory syncytial virus (RSV) is a major cause of severe respiratory infections in infants worldwide and is recognized as a critical pathogen in adults, especially the elderly. Despite intensive research, safe and effective vaccines have remained elusive. One chief explanation resides in the history of RSV vaccine-enhanced respiratory disease, as RSV infection of children previously immunized with a formalin-inactivated-RSV vaccine has been associated with exacerbated pathology. There is a wide variation in the immune responses against RSV and, surprisingly, 99% of RSV-associated mortality in infants occurs in westernized countries suggesting that the development of such immunopathologies could be linked with major changes in human exposure to microbes during childhood. In that context, immune imprinting by viruses could be a key determinant for variation in disease susceptibility. In particular, persistent viruses such as gammaherpesviruses (γHVs) have coevolved as 'old friends' with their host by establishing a reciprocal beneficial that appears to deeply influence the host's immune system. As these infections occur in the period of early-life, they might have substantial training effects on the host immunity that can affect heterologous responses such as response to pneumoviruses. In this study, we used Murid herpesvirus 4 and Pneumovirus of mice (PVM), a model for RSV, to investigate the potential impact of γHV infections on the development of pneumovirus-induced immunopathologies. We showed that a previous γHV infection protects against both PVM vaccine-enhanced disease and PVM primary infection by eliciting a strong CD8+T cell response. This therefore sheds a new light on our understanding of PVM-induced diseases and opens new perspectives for the development of vaccine strategies.

Keywords : Pneumovirus/immunopathology/gammaherpesvirus/CD8
Authors :
References : , , ,

Authors

Bénédicte Machiels 1, Mickael Dourcy 1, Céline Maquet 1, Gauthier Gilliaux 2, Justine Javaux 1, Daniel Desmecht 2, Benjamin Dewals 1, Laurent Gillet 1,

1. Department of infectious and parasitic diseases, Uliege, Liège, BELGIUM
2. Department of Morphology-Pathology, Uliege, Liège, BELGIUM