Product # P121

Human Parainfluenza Virus Type 1 with Green Fluorescent Protein (PIV1-GFP)

Introduction

Human parainfluenza virus type 1 (PIV1) is a significant cause of severe respiratory tract disease in infants and young children. PIV1 is an enveloped, non-segmented, single-stranded, negative-sense RNA virus belonging to the subfamily *Paramyxovirinae* within the *Paramyxoviridae* family, which also includes the PIV2 and PIV3 serotypes. These serotypes can be further classified as belonging to either the *Respirovirus* (PIV1 and PIV3) or *Rubulavirus* (PIV2) genus and are immunologically distinct in that primary infection does not result in cross-neutralization or cross-protection. The PIV1 genome encodes three nucleocapsid-associated proteins including the nucleocapsid protein (N), the phosphoprotein (P) and the large polymerase (L) and three envelope-associated proteins including the internal matrix protein (M) and the fusion (F) and hemagglutinin-neuraminidase (HN) transmembrane surface glycoproteins. F and HN are the two viral neutralization antigens and are the major viral protective antigens. In addition, the P/C gene of PIV1 contains a second open reading frame that encodes four accessory C proteins, C, C', Y1 and Y2, that initiate at four separate translational start codons and are carboxy co-terminal. The PIVs cause respiratory tract disease ranging from mild illness, including rhinitis, pharyngitis, and otitis media, to severe disease, including croup, bronchiolitis, and pneumonia. A licensed vaccine is currently not available for any of the PIVs.

Description

PIV1-GFP was created based on a wildtype biologically-derived human PIV1 strain Washington/20993/1964. The GFP gene (EGFP, Clontech; 750 nt) was inserted at *MluI* site upstream of the N gene as the first gene, and recombinant PIV1-GFP virus was rescued using a reverse genetics technique. The recovered virus was cloned by two successive rounds of terminal dilution using LLC-MK2 cells, followed by propagation in LLC-MK2 cells. PIV1-GFP expresses GFP in infected cells, allowing the detection of infected cultures without hemadsorption or immunostaining. PIV1-GFP was found to contain spontaneous mutations C^{R84G} (R to G mutation at amino acid position 84 in the C gene) and HN^{T553A} (T to A at 553 in HN gene). The replication of PIV1-GFP in cell cultures was found to be similar to that of its biologically derived parent virus, but mildly attenuated in the respiratory tract of monkeys.

Specification

Parental Strain:	Washington/20993/1964
Construction:	GFP gene was inserted upstream of the N gene as the 1st gene.
Passage History:	The isolate was cloned and propagated in LLC-MK2 cells.
Infectivity:	Titer > 7.0 $\log_{10}$ $TCID_{50}$ per mL. Infectious in humans.
Volume/Storage:	2 x 1.2 mL per cryovial. Store at −80°C.
Quality Testing:	No bacteria, fungus, or mycoplasma detected. Endotoxin < 10 EU/mL.
Availability:	Bulk quantity and custom orders are available. Contact info@viratree.com.