



Kent Academic Repository

Neto, Martin Mayora, Cantoni, Diego, Genova, Cecilia di, Scott, Simon D., Derveni, Mariliza, Wright, Edward and Temperton, Nigel J. (2022) *Comparison of lentiviral and vesicular stomatitis virus core SARS-CoV-2 pseudotypes and generation of a stable cell line for use in antibody neutralisation assays.* In: *Access Microbiology*. 4 (5).

Downloaded from

<https://kar.kent.ac.uk/98156/> The University of Kent's Academic Repository KAR

The version of record is available from

<https://doi.org/10.1099/acmi.ac2021.po0438>

This document version

Publisher pdf

DOI for this version

Licence for this version

CC BY (Attribution)

Additional information

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in *Title of Journal*, Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our [Take Down policy](https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies) (available from <https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies>).



ACCESS MICROBIOLOGY

an open research platform

Volume 4, Issue 5

Comparison of lentiviral and vesicular stomatitis virus core SARS-CoV-2 pseudotypes and generation of a stable cell line for use in antibody neutralisation assays

Martin Mayora Neto¹, Diego Cantoni¹, Cecilia di Genova¹, Simon Scott¹, Mariliza Derveni¹, Edward Wright¹, Nigel Temperton¹

 [View Affiliations](#)

Published: 27 May 2022

Betacoronavirus SARS-CoV-2, the causative agent of COVID19, is a single stranded positive sense RNA virus. Since its emergence there has been great efforts to identify correlates of protection, which is crucial for vaccine evaluation studies. However, handling SARS-CoV-2 requires BSL-3 containment facilities slowing research efforts. Pseudotype viruses (PV) are a safe alternative to authentic virus that can be handled at low containment. PVs are chimeric viruses containing the core of a virus where its genome has been completely or partially replaced by a reporter gene, displaying a correctly folded SARS-CoV-2 spike on its surface. We developed lentiviral and vesicular stomatitis virus (VSV) core PVs alongside a stable A549 cell line expressing receptor ACE2 and protease TMPRSS2 responsible for S protein priming, for use in neutralization assays. Lentiviral PVs were generated by transfection with plasmids encoding the spike, HIV-1 gag-pol and a luciferase reporter. For VSV PVs, producer cells pre-transfected with the spike were infected with recombinant VSV expressing luciferase, before harvesting. The stable A549 cell line was generated by sequential infection of VSV-G PVs bearing lentiviral vectors encoding ACE2 and TMPRSS2 genes followed by antibiotic selection, before being tested in neutralization assays. We compared lentiviral and VSV PV platforms using monoclonal antibodies and convalescent sera with our stable A549 cells or HEK293T cells pre-transfected with plasmids encoding ACE2 and TMPRSS2. Antibody titres showed equivalence however VSV had the advantage of a shorter incubation therefore enabling a higher throughput. PVs offer a robust platform for future seroepidemiology and vaccine evaluation studies.

Published Online: 27/05/2022

© 2022 The Authors

This is an open-access article distributed under the terms of the Creative Commons Attribution License.

Most read this month

Co-infection of SARS-CoV-2 with other respiratory pathogens in patients with liver disease

Jasmine Samal, Reshu Agarwal, Anushka Soni, Amit Pandey, Shalini Thapar and Ekta Gupta

Case Report: *Vibrio fluvialis* isolated from a wound infection after a piercing trauma in the Baltic Sea

Juliane Hecht, Maria Borowiak, Bernhard Fortmeier, Salah Dikou, Wolfgang Gierer, Ingo Klempien, Jonas Nekat, Stephan Schaefer and Eckhard Strauch

***Ralstonia mannitolilytica*: an emerging multidrug-resistant opportunistic pathogen in a tertiary care hospital setting**

Tasneem Siddiqui, Sangram Singh Patel, Richa Sinha, Ujjala Ghoshal and Chinmoy Sahu

Detection of *Enterococcus avium* in a case of urinary tract infection and haematuria

Abdelrhman Abo-Zed, Shaymaa Hegazy and Tung Phan

Draft genome sequences of *Pseudomonas amygdali* pv. *loropetali* pathotype strain DSM 105780^{PT}, isolated from Florida

Apekshya Parajuli, Carrie L. Harmon, Gerald V. Minsavage, Debra D. Jones, Sujan Timilsina, Mathews L. Paret and Jeffrey B. Jones

Most cited this month



Antibacterial activity of high-dose nitric oxide against pulmonary *Mycobacterium abscessus* disease

Kristijan Bogdanovski, Trisha Chau, Chevalia J. Robinson, Sandra D. MacDonald, Ann M. Peterson, Christine M. Mashek, Windy A. Wallin, Mark Rimkus, Frederick Montgomery, Joas Lucas da Silva, Shashank Gupta, Abdi Ghaffari, Adrian M. Zelazny and Kenneth N. Olivier

Growth and metabolic characterization of four lactic acid bacteria species isolated from rice beer prepared in Assam, India

Arup Jyoti Das, Manas Jyoti Das, Tatsuro Miyaji and Sankar Chandra Deka

Photodynamic antimicrobial chemotherapy coupled with the use of the photosensitizers methylene blue and temoporfin as a potential novel treatment for *Staphylococcus aureus* in burn infections

Alistair Hampden-Martin, Jo Fothergill, Mohamed El Mohtadi, Lucy Chambers, Anthony J. Slate, Kathryn A. Whitehead and Kayvan Shokrollahi

***Ruminococcus gnavus* bacteraemia in a patient with multiple haematological malignancies**

Caroline Gren, Malene Roed Spiegelhauer, Emelie Curovic Rotbain, Boje Kvorning Ehmsen, Peter Kampmann and Leif Percival Andersen

Biosynthesis of silver nanoparticles using baker's yeast, *Saccharomyces cerevisiae* and its antibacterial activities

Ifeyomi Olobayotan and Bukola Akin-Osanaiye

+ More

