Altered pathogenicity, transmissibility, and fitness of the SARS-CoV-2 Omicron (B.1.1.529) variant in the golden Syrian hamster model

WHO COVID-19 vaccines research:
What recent evidence do we have that omicron is evading immunity and what are the implications?
14 February 2022 (13:00-17:15 CET)

Jasper Fuk-Woo Chan
State Key Laboratory of Emerging Infectious Diseases
Department of Microbiology, The University of Hong Kong
Department of Clinical Microbiology & Infection Control, HKU-Shenzhen Hospital
ACKNOWLEDGEMENTS & DISCLOSURES

• Grants:
  – Health@InnoHK, Innovation and Technology Commission, the HKSAR Government, PRC
  – Health and Medical Research Fund, The Food and Health Bureau, the HKSAR Government, PRC
  – General Research Fund, Research Grants Council, the HKSAR Government, PRC
  – Department of Health, The Food and Health Bureau, the HKSAR Government, PRC
  – National Key R&D Program of China, MOST, PRC
  – Sanming Project of Medicine in Shenzhen, PRC (SZSM201911014)
  – High Level-Hospital Program, Health Commission of Guangdong Province, PRC

• Invited lectures / Travel grants:
  – Luminex Corporation
  – Gilead Sciences Hong Kong Ltd.
  – Pfizer Corporation Hong Kong Ltd.
  – Astellas Pharma Hong Kong Co., Ltd.

• Reference: https://www.biorxiv.org/content/10.1101/2022.01.12.476031v1
Pathogenicity


(Halfmann PJ et al. *Nature*. 2022)
Both Delta & Omicron variants were highly transmissible through contact transmission.
Non-contact Transmission

(About 15-20% higher than Delta)
Virus Fitness

In vitro competition assay in Calu-3 cells (Omicron:Delta = 1:1) without vaccines’ sera

In vitro competition assay in Calu-3 cells (Omicron:Delta = 1:1) with (mRNA) vaccinees’ sera
**In Vivo Virus Fitness**

**E**
- Omicron:Delta 1:1 mixture virus challenge
- Day 0
- Sacrifice Index after co-housing
- Day 2
- Sacrifice recipient
- Day 4
- Non-vaccinated index hamsters
- 6 independent pairs
  - Co-housing for 4 hrs before separation

**F**
- Omicron:Delta 1:1 mixture virus challenge
- Day 0
- Day 14
- Day 28
- Sacrifice Index after co-housing
- Day 102
- Co-housing for 4 hrs before separation
- Day 104
- 6 independent pairs
- Vaccinated index hamsters
- Day 100
- Sacrifice recipient

**G**
- Reciprocal serum IgG titers
- Day 7 post-vaccination
- Day 14 post-vaccination
- Day 28 post-vaccination
- Day 100 post-vaccination

**H**
- Relative antibody response against spike RBD (O/D ratio)
- Hamster 1
- Hamster 2
- Hamster 3
- Hamster 4
- Hamster 5
- Hamster 6

**I**
- Relative Replicative Fitness
- Log10(Omicron:Delta)
- Nasal turbinate
- Trachea
- Lung

**J**
- Relative Replicative Fitness
- Log10(Omicron:Delta)
- Exposed to non-vaccinated index hamster
- Exposed to vaccinated index hamster
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