

# IMPERIAL

## **Pan-antiviral effects of RIG-I agonist (RIG101) against respiratory syncytial virus and human rhinovirus in nasal epithelium *in vitro* and mice *in vivo***

**Leah Daly**<sup>1</sup>

A. Moen<sup>1</sup>, H. Ombredane<sup>1</sup>, I. Knowles<sup>2</sup>, J. Shur<sup>3</sup>, G. Rapeport<sup>3</sup>, Susan Sobolov<sup>3</sup>, **K. Ito**<sup>1,3</sup>

<sup>1</sup> Imperial College London, London, United Kingdom

<sup>2</sup> Pharmidex, London, United Kingdom

<sup>3</sup> RIGImmune Inc, CT, USA

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I have no real or perceived conflicts of interest that relate to this presentation.

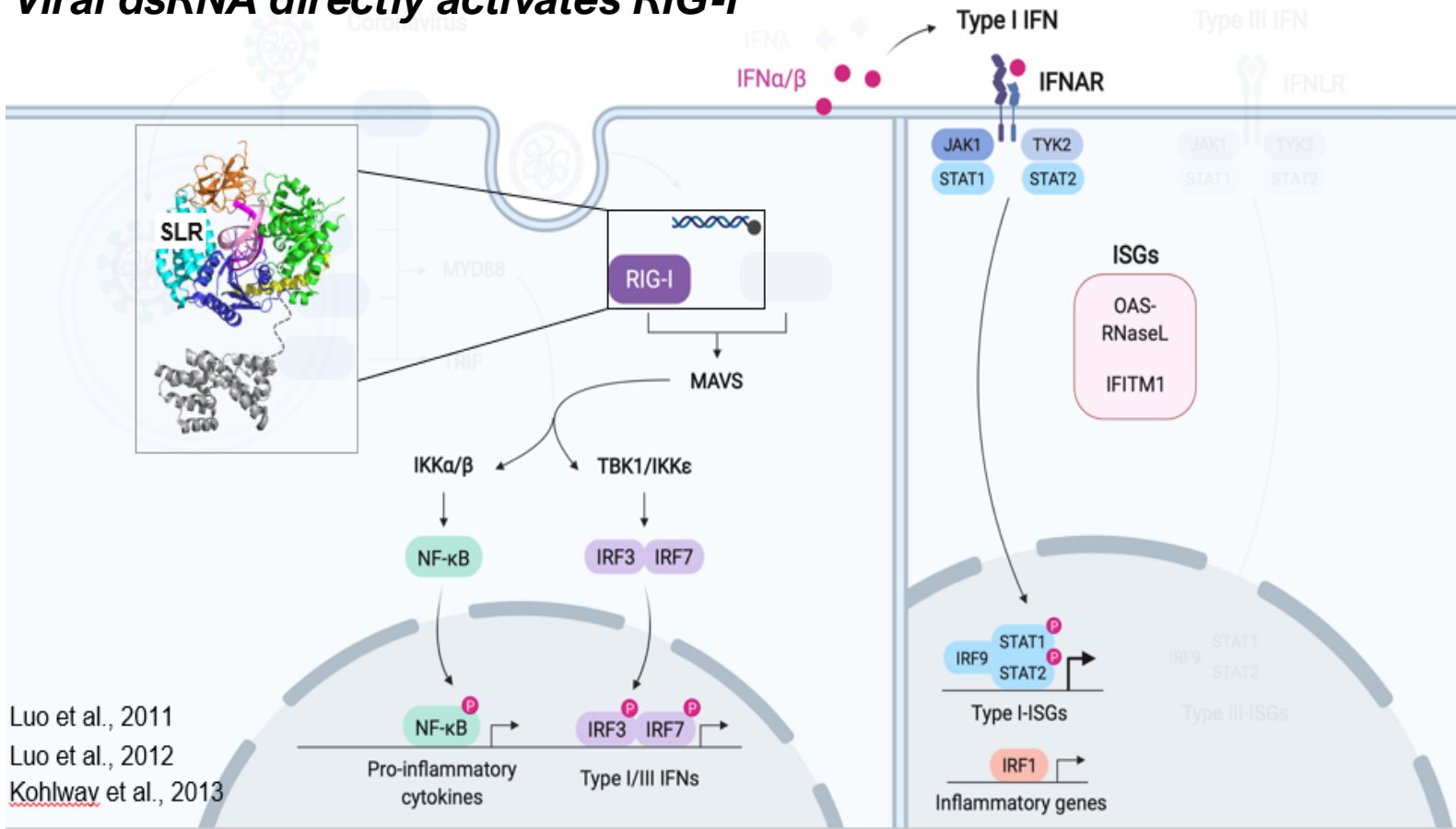
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Grants/research support:	RIGImmune Inc. (LD)
Honoraria or consultation fees:	-
Participation in a company sponsored bureau:	-
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# RIG-I – first line of defence against RNA viral pathogens

*Viral dsRNA directly activates RIG-I*



- Antiviral response by ISGs (interferon stimulating gene) through IFN pathway.

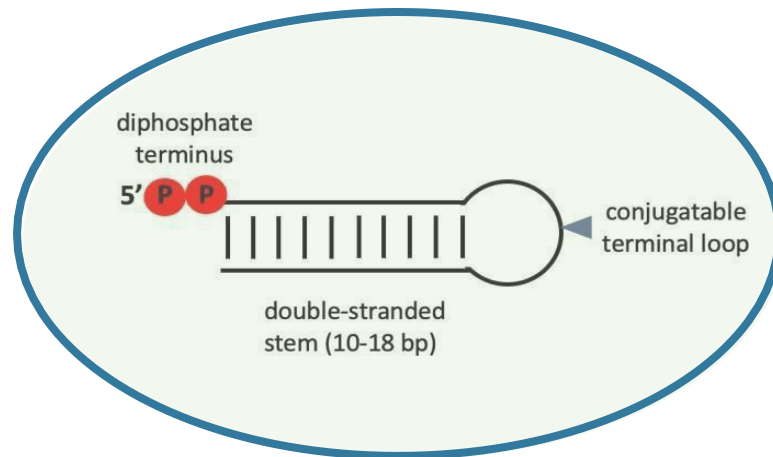
Luo et al., 2011  
Luo et al., 2012  
Kohlway et al., 2013

# RIG-101, a synthetic RIG-I agonist, delivered in novel NEED™ formulation

## RIG-101

(Synthetic stem loop RNA)

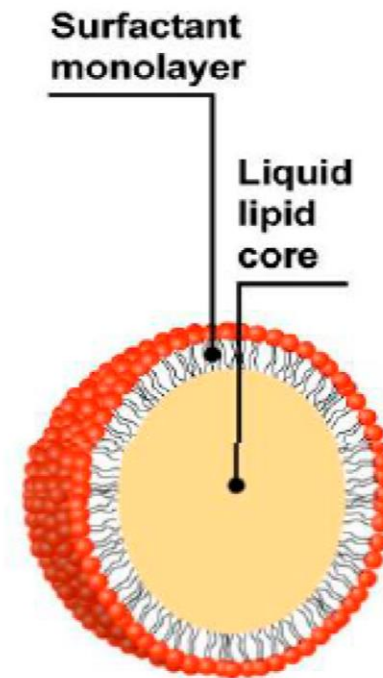
- RIG-101 is optimized to be a highly selective RIG-I agonist.



## NEED™

(Nano-Emulsion Enhanced Delivery)

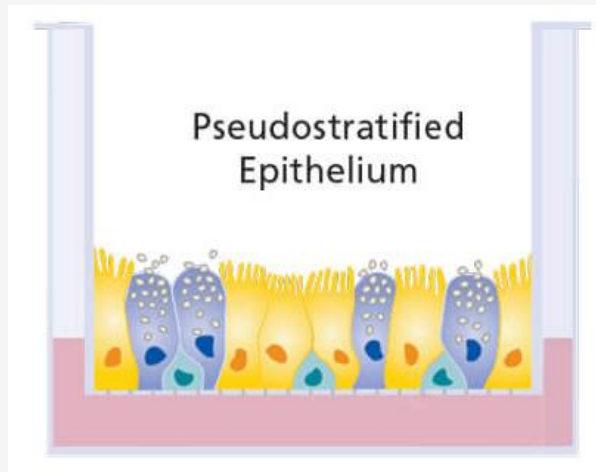
- Novel non-LNP delivery system
- Proprietary transformation of surfactants and fatty acids into a nano-emulsion complex (non-LNP) that encapsulates a nucleic acid payload with control of particle size and charge (RIGImmune Inc. patent pending).



# RIG-101 NEED™ is able to induce IFN signaling in air-liquid interface (ALI) cultured nasal epithelium

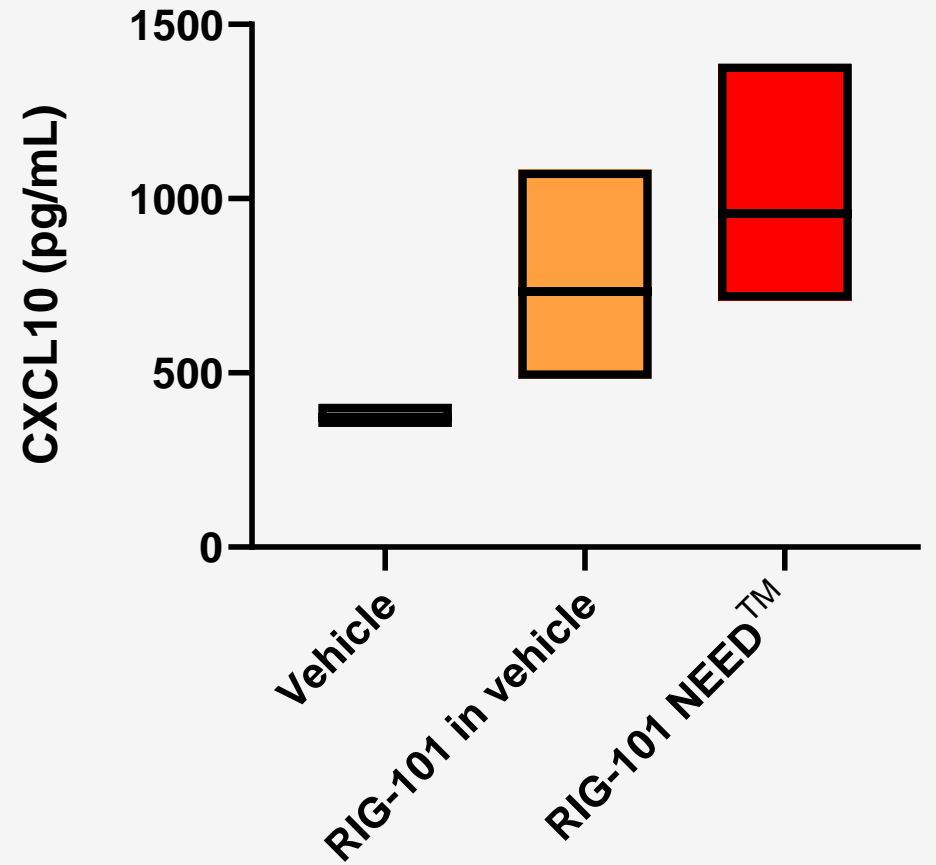
Apical Treatment

50µL, 30min

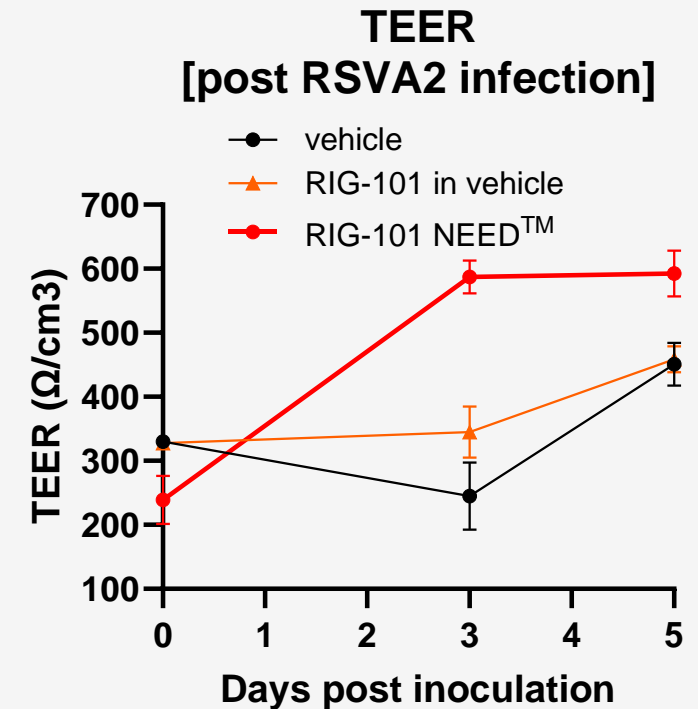
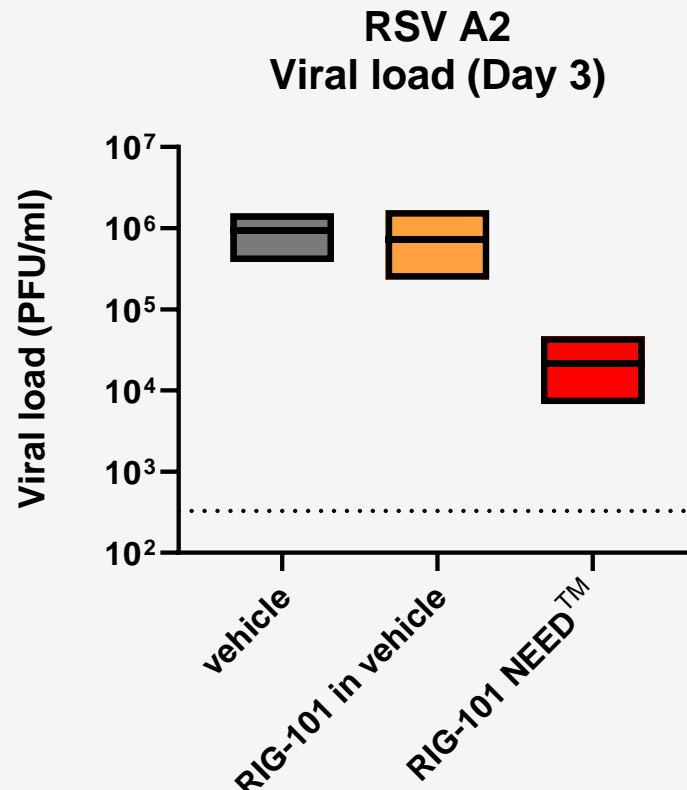
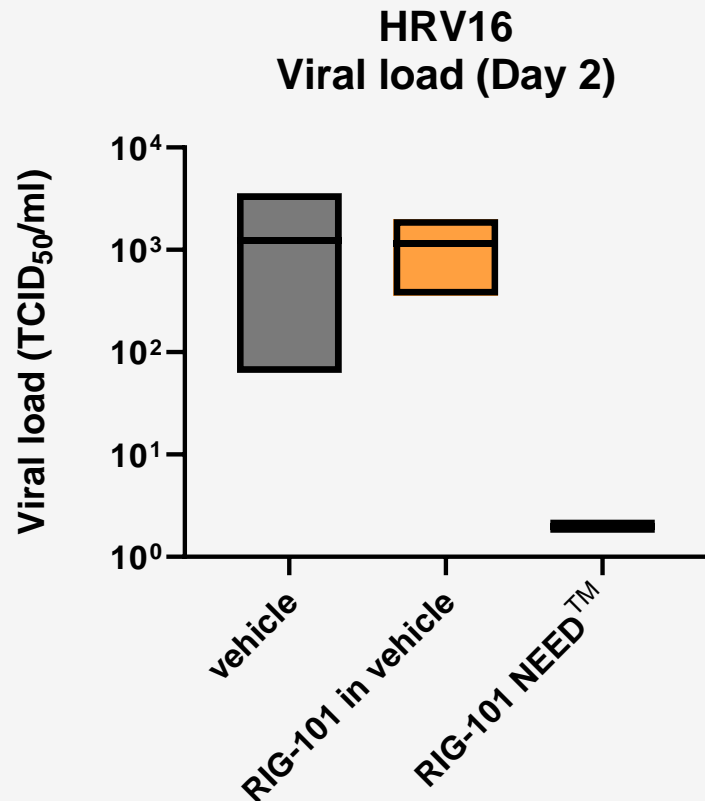
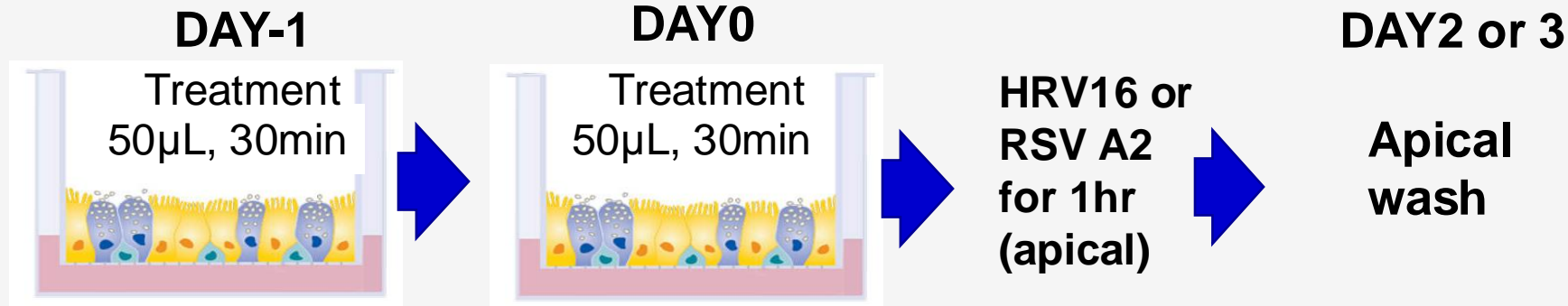


Apical wash collection

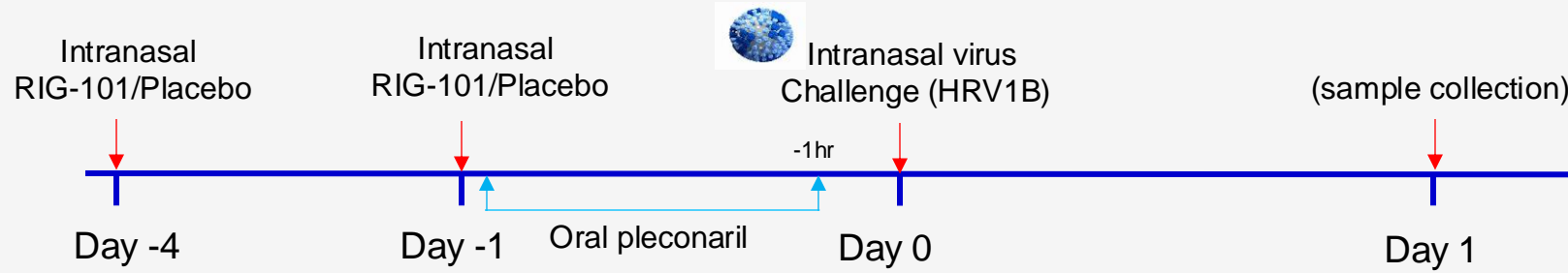
CXCL10 in apical wash [24hrs post treatment]



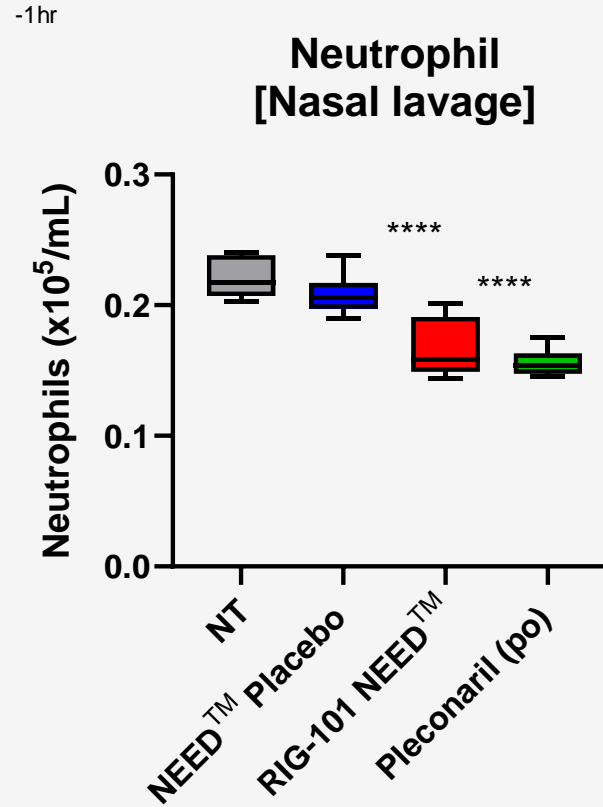
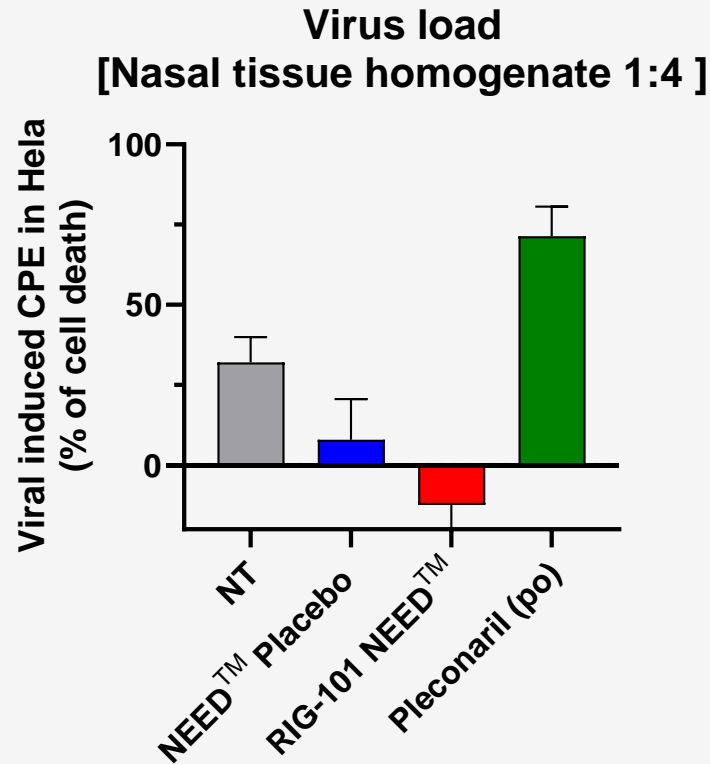
# Prophylactic treatment of RIG-101 NEED™ reduces HRV and RSV viral load and improves cell integrity in ALI nasal epithelium



# Intranasal RIG-101 NEED™ reduces HRV1B viral load and neutrophilia in HRV1B-infected mice



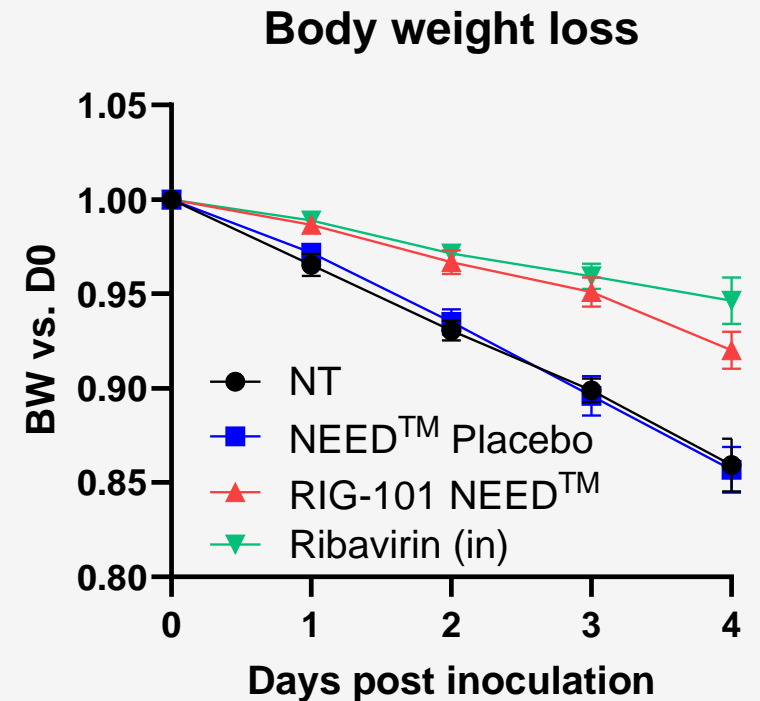
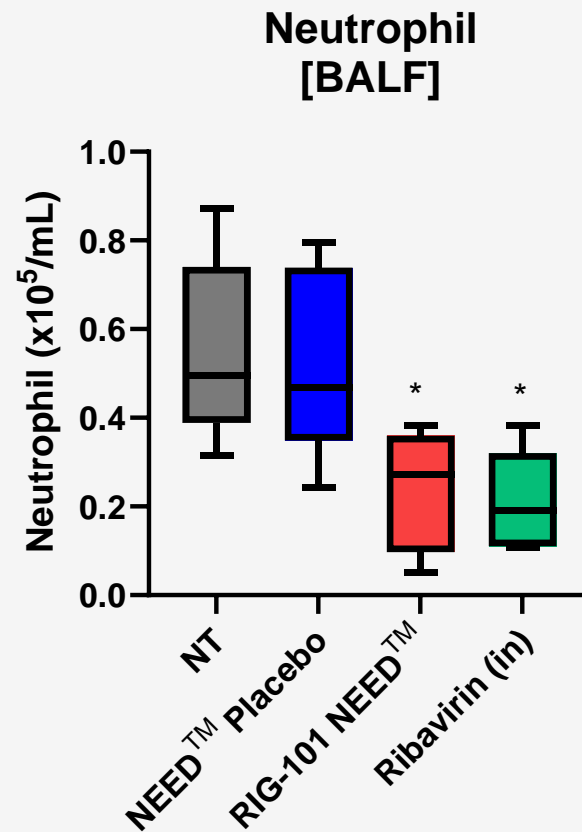
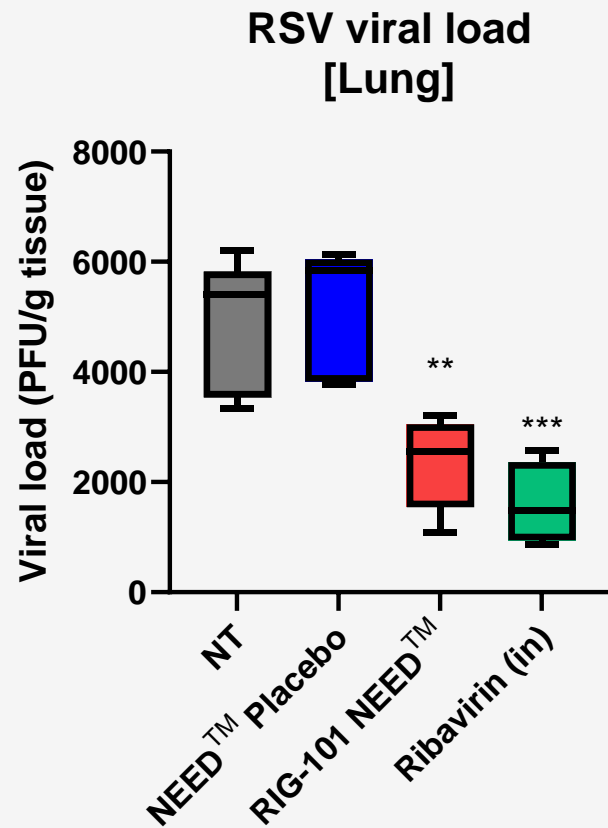
RIG-101 (2mg/ml, in)  
Pleconaril (200mg/kg, po)



# Intranasal RIG-101 NEED™ reduces RSV viral load and neutrophilia in RSV-infected mice



RIG-101 (2mg/ml)  
Ribavirin (125µg/kg)





# Summary

- Prophylactic treatment of RIG-101 NEED™ at apical site in ALI human nasal epithelium and given intranasally in mice demonstrates potent antiviral activities against HRV and RSV.
- RIG-101 NEED™ also shows anti-influenza activity *in vitro* and *in vivo* (10th Sep. OA5462, Ombredane).

# Conclusion

This suggests that topical RIG-101 delivered to nasal tract can induce sterilising immunity. Prophylactic treatment of RIG101 nanoemulsion potentially prevents respiratory virus induced exacerbation in respiratory disorders such as asthma.

**IMPERIAL**

Thank you