

# Pathogenesis of serotype 1 Marek's disease vaccines in the lung

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# Introduction

- Serotype 1 MDV vaccines

- Types

- Naturally low virulence (CVI988)
    - Highly virulent attenuated in cell cultures (R2/23)
    - Attenuated by the insertion of the REV LTR (RM1)

- Protection ability:

- High protective (HP) vs low protective (LP)

- Pathogenesis

- MDV replication in the lung

- Natural route of exposure
  - HP vs LP at 6 dpi and SC route

# Objectives

1. To determine if highly protective (HP) serotype 1 MDV vaccines replicates better in the lung than low protective (LP) serotype 1 MDV vaccines at 3, 5, and 10 dpi
2. To determine if the route of infection influences the level of replication in the lung
3. To determine if the dose of vaccine influences the level of replication in the lung

# HP vs LP vaccines

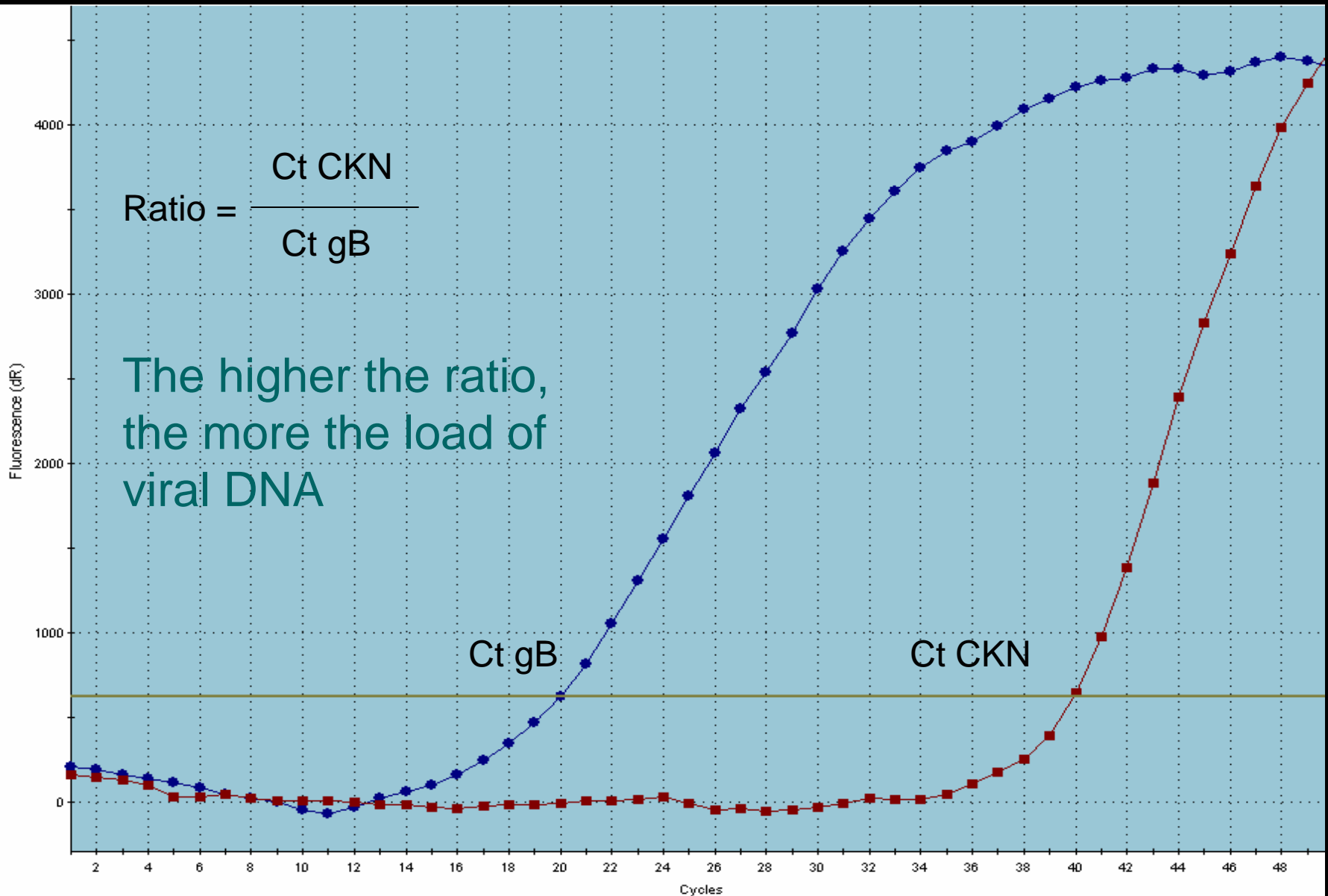
Relative protection	Serotype 1		
	CVI988	Md11	648A
HP	CVI988/BP5 CVI988	R2	648A80
LP	CVI988/Clone C	R2/23	648A100

# Material and Methods

- Chickens: SPAFAS Ab-
- Virus: 2,000 PFU SC
  - HP: CVI988/BP5, CVI988, 648A80, R2
  - LP: R2-23, 648A100
- Sampling: 3, 5, 10 dpi
  - Lung, Spleen
  - Real time PCR
    - Taqman (gB)
    - SYBR<sup>®</sup> green (GDH)

- Chickens: SPAFAS Ab-
- Dose: 2,000 PFU, 10,000 PFU
- Route: SC, IO
- Virus: CVI988, R2, R2-23
- Sampling: 3, 5, 10 dpi
  - Lung, Spleen
  - Real time PCR
    - Taqman (gB)
    - SYBR<sup>®</sup> green (GDH)

# Material and Methods



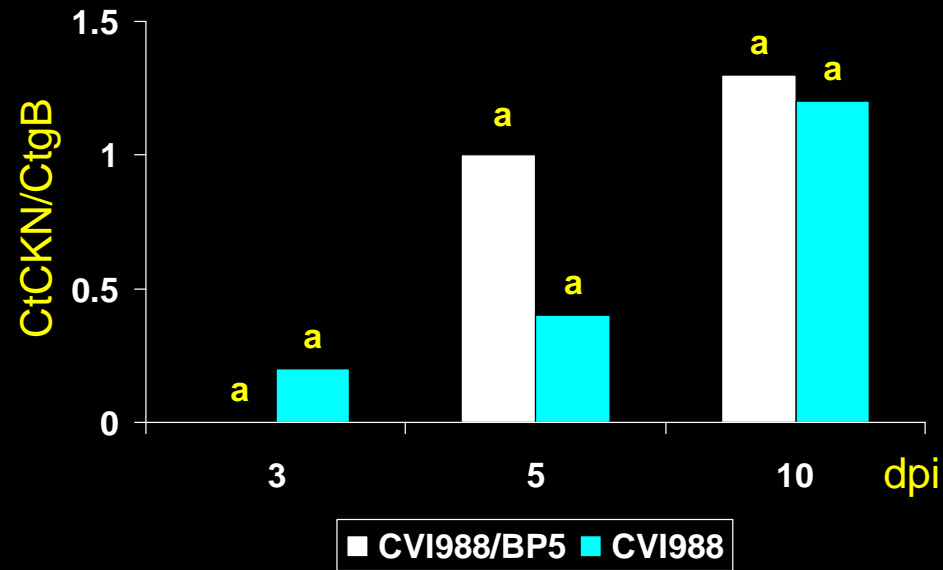
# Material and Methods

- Load of viral DNA in the lung:
  - Ratio (CtCKN/CtgB)
- Load of viral DNA in the lung vs load of viral DNA in the spleen:
  - Ratio lung (CtCKN/CtgB)
  - Ratio spleen (CtCKN/CtgB)
  - Ratio lung – Ratio spleen

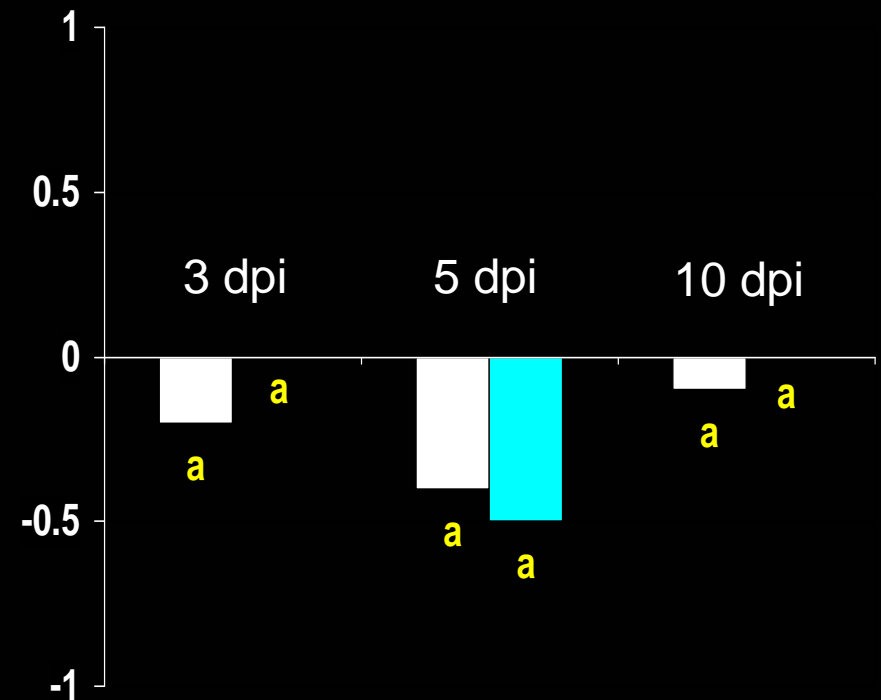
# CVI988/BP5 (HP) vs. CVI988 (HP)

2000PFU SC

Lung

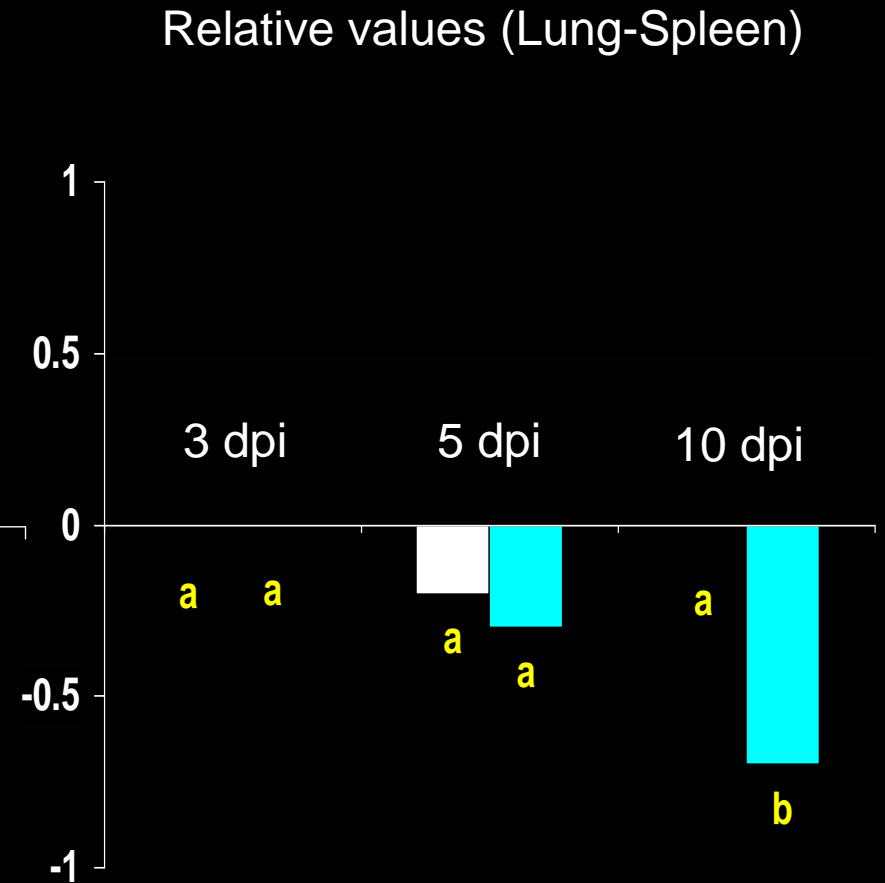
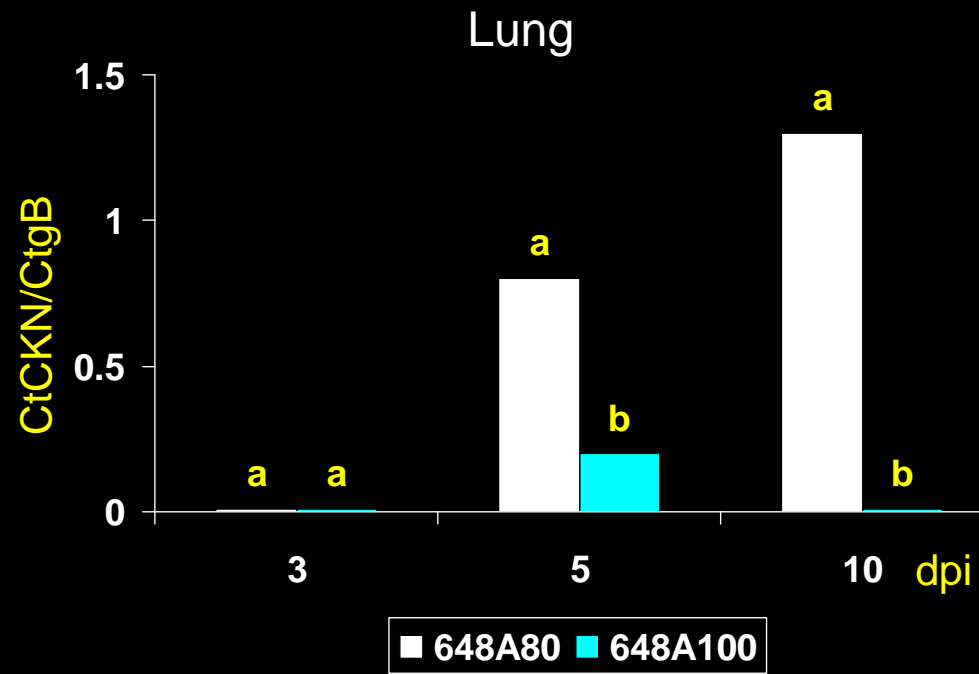


Relative values (Lung-Spleen)



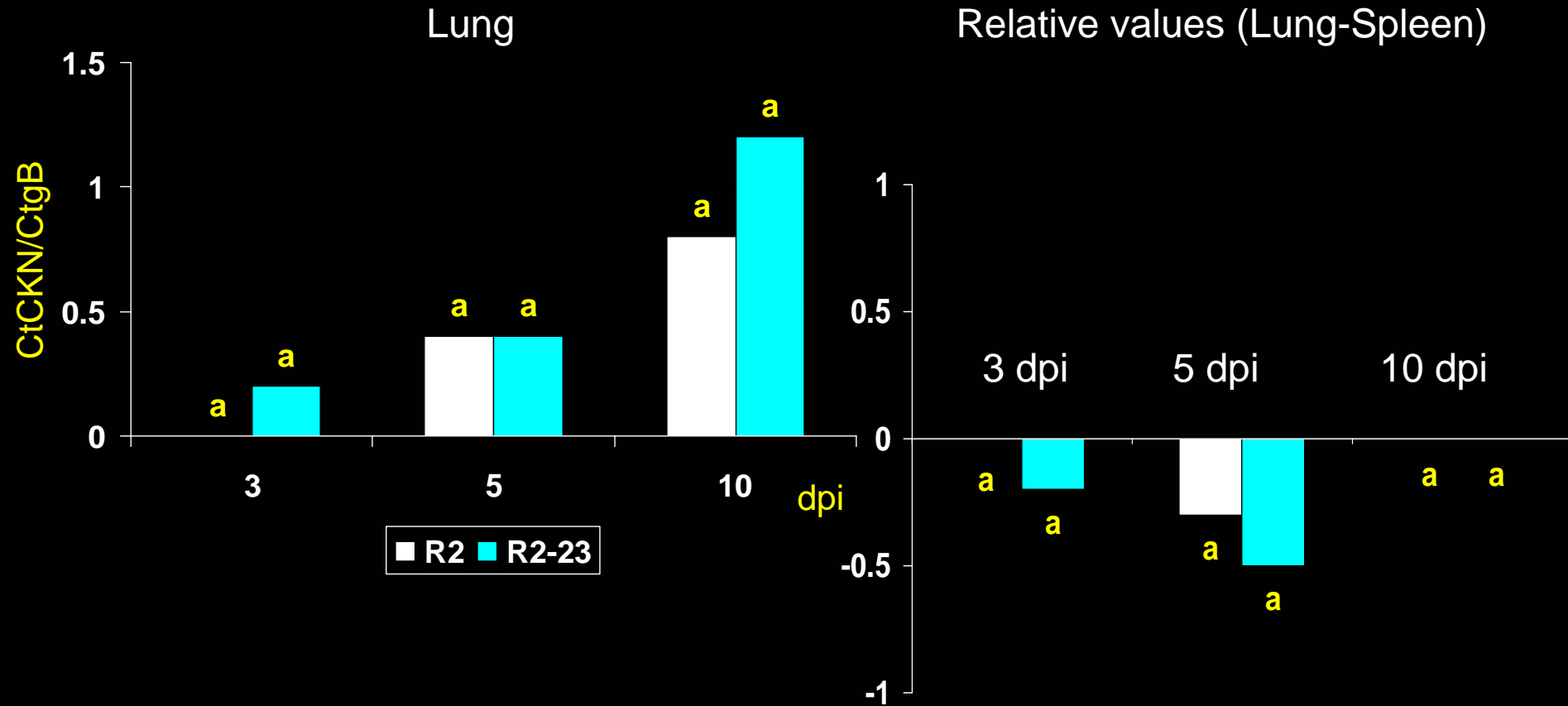
# 648A80 (HP) vs. 648A100 (LP)

2000PFU SC



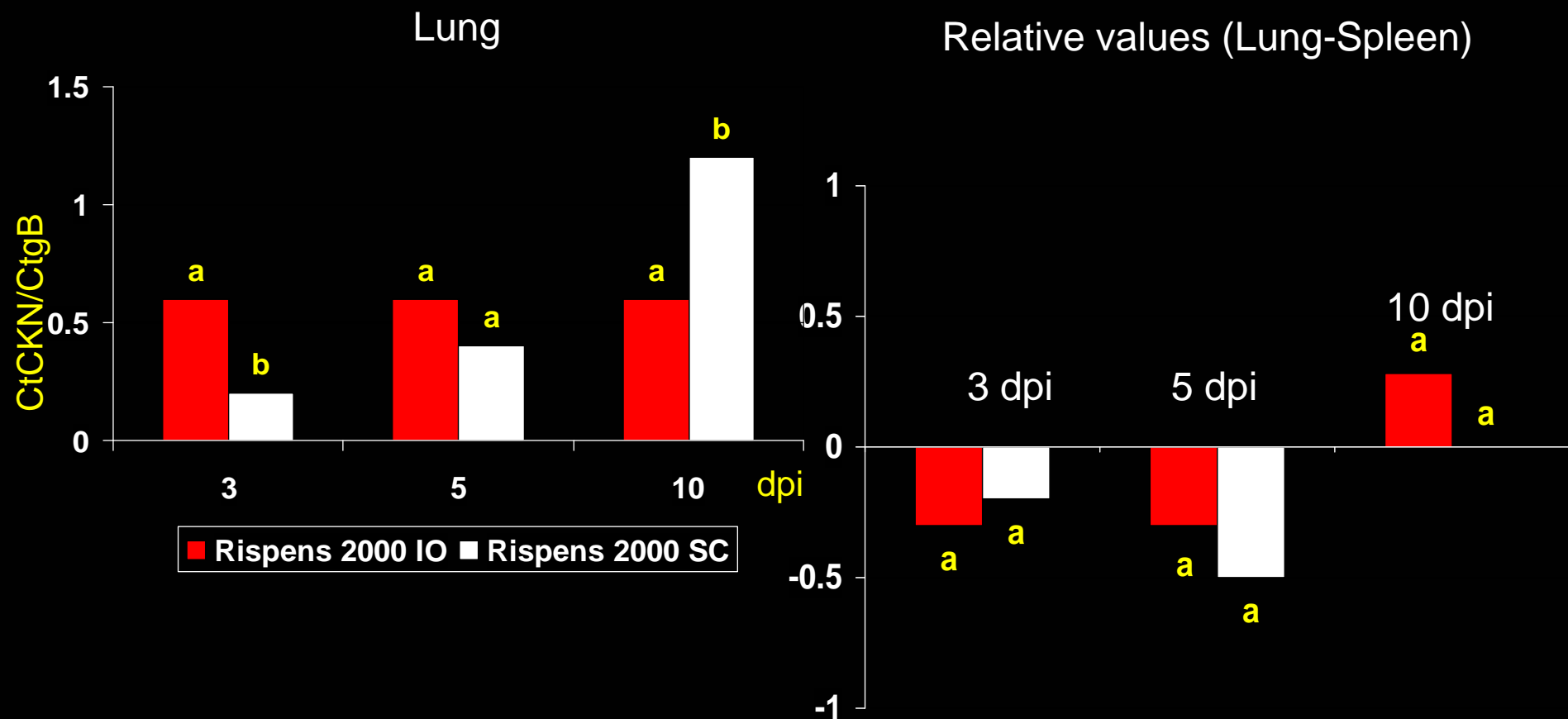
# R2 (HP) vs. R2-23 (LP)

2000PFU SC



Does route of inoculation have an effect on how serotype 1 MDV vaccines replicate in the lung?

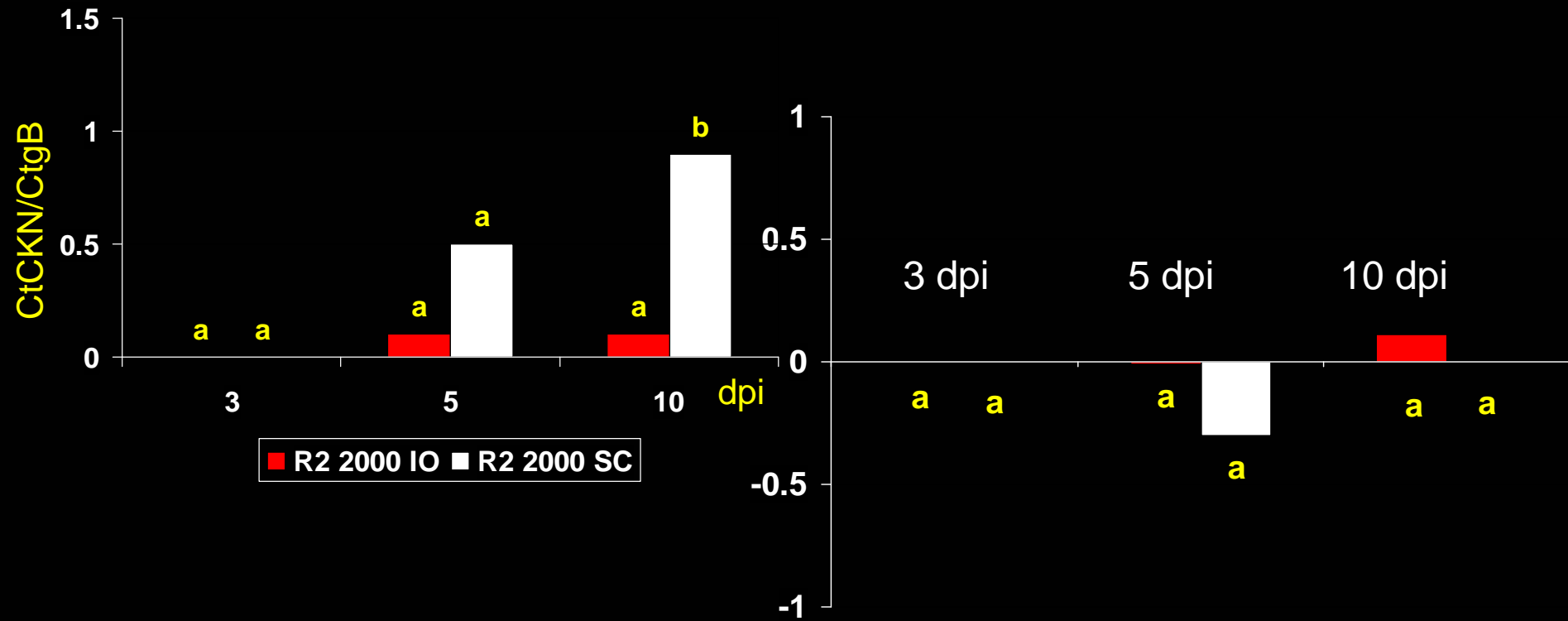
# CVI988 *in ovo* vs. SC inoculation



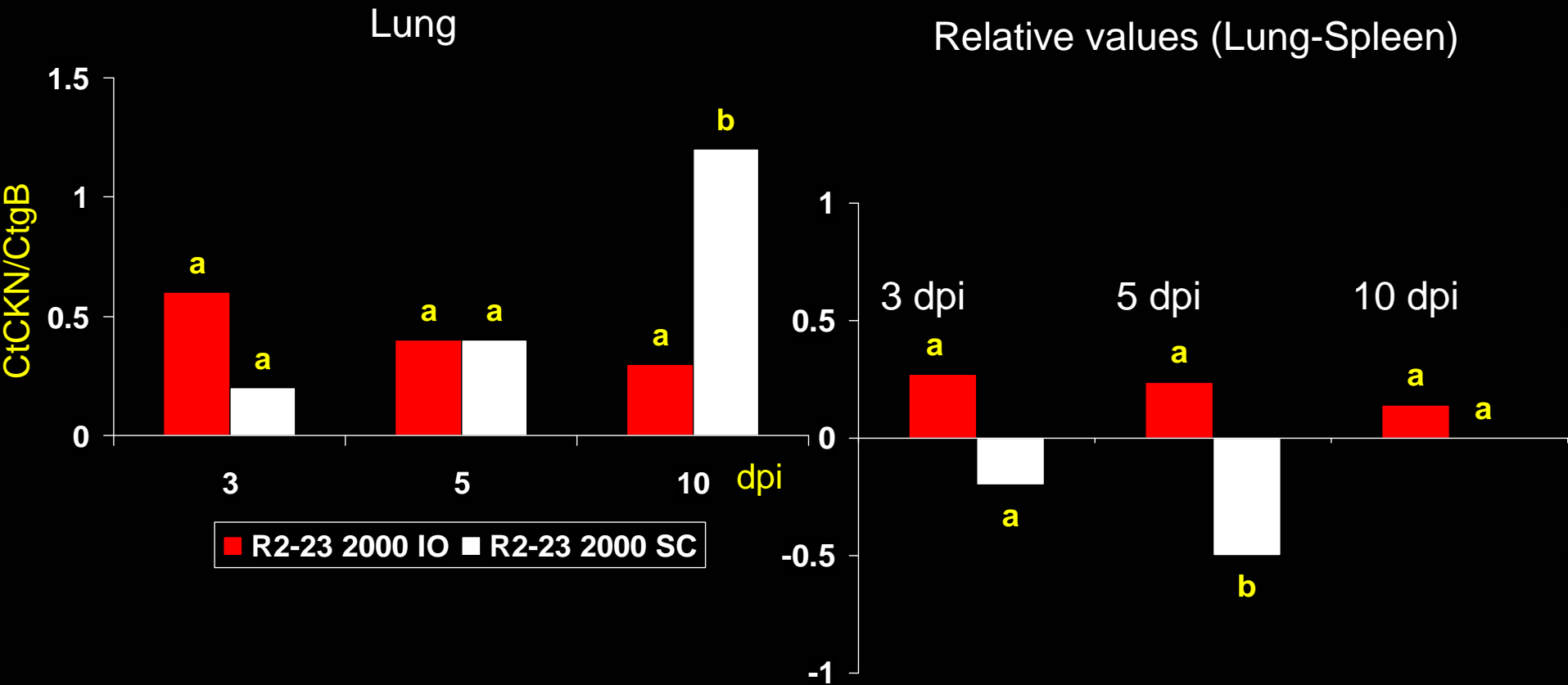
# R2 *in ovo* vs. SC inoculation

Lung

Relative values (Lung-Spleen)

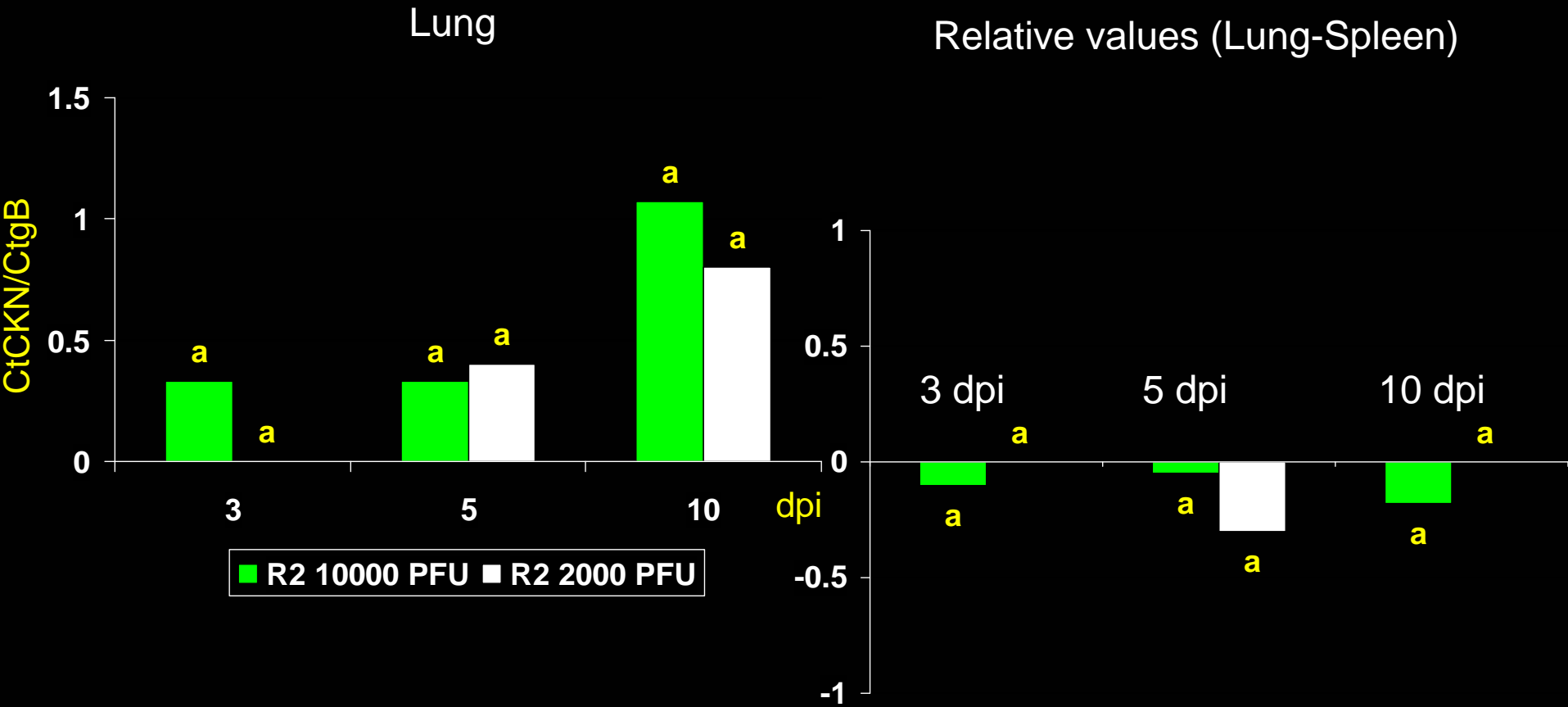


# R2-23 *in ovo* vs. SC inoculation



Are higher vaccine doses  
associated with better replication  
in the lung?

# R2 (SC) 2000 PFU vs. 10,000 PFU



# Conclusions

1. In general, HP vaccines replicates more in the lung than LP vaccines but there are differences between vaccine strains
2. The ability of the virus to replicate in the lung vs. in the spleen is increased when administered *in ovo*
3. Replication in the lung was not influenced by the dose

# Future studies

1. How increased replication in the lung contributes to higher levels of protection?
2. Pathogenicity of MDV vaccine in the lung seems to be different when administered *in ovo*. Could we use such differences to improve protection?

# Questions??

