

# DIFFERENTIAL LUCIFERASE EXPRESSION IN AIRWAYS OF NORMAL AND CYSTIC FIBROSIS MICE

Patricia Cmielewski<sup>1,3</sup>, Donald Manson<sup>2,4</sup>, David Parsons<sup>1,5</sup>

1. Respiratory and Sleep Medicine, Women's and Children's Hospital, SA
2. Gene Technology Unit, SA Pathology
3. School of Paediatrics and Reproductive Health, University of Adelaide, South Australia, SA
4. Centre for Stem Cell Research, University of Adelaide, SA
5. Women's and Children's Health Research Institute, SA

## Introduction

Non-invasive bioluminescence imaging allowed for rapid *in-vivo* quantification of long-lasting gene transfer in experimental animals. We are testing the longevity of a single delivery of our lentiviral (LV) gene transfer in normal and cystic fibrosis (CF) mouse airways.

## Methods

lysophosphatidylcholine (LPC) or a control (PBS) pre-treatment of mice prior to delivery of a LV vector containing the reporter gene luciferase (LV-Luc). Another control group received PBS or vector (LV-MT). Bioluminescence was measured at 1, 3, 6, 9, 12, 15, 18, 21, 24, 27 or 30 months after LV dosing to assess the level and longevity of gene transfer.

## Results

**Normal mice:** Mice that received LPC/LV-Luc treatment had significantly greater gene transfer compared to the two control groups at all time points ( $p < 0.05$ , RM ANOVA, Fig 2a). No luminescence was detected in mice treated with LPC/LV-MT. Unexpectedly luciferase activity was also detected in the lungs. There was no significant difference in lung luminescence between the LPC and PBS pre-treated mice that received LV-Luc (Fig 2b).  
statistical difference in lung luminescence between mice that received LPC and PBS LV-Luc (Fig 2b).

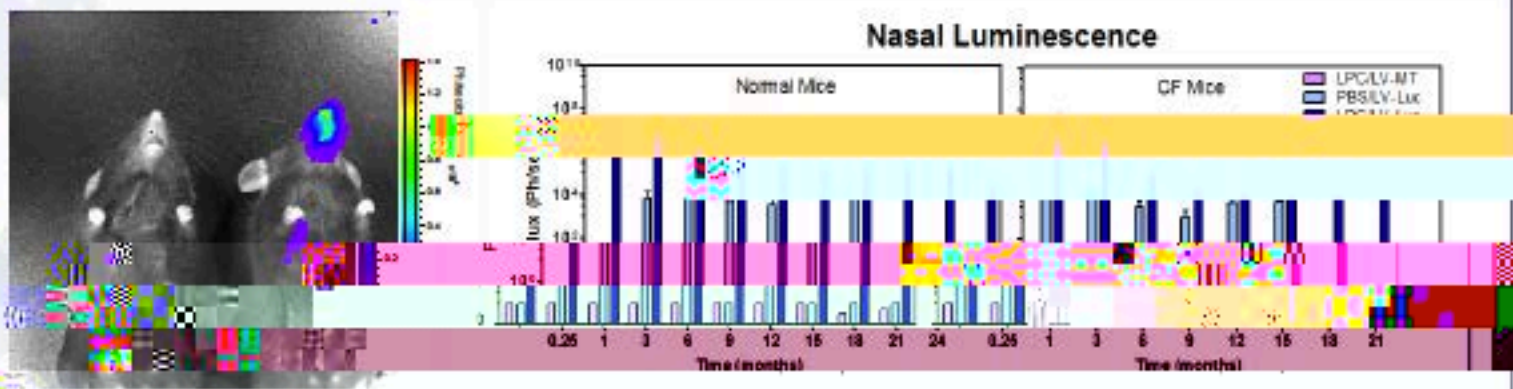


Fig. 1a. LV-luciferase luminescence. Normal mice: PBS (left) vs LPC (right)

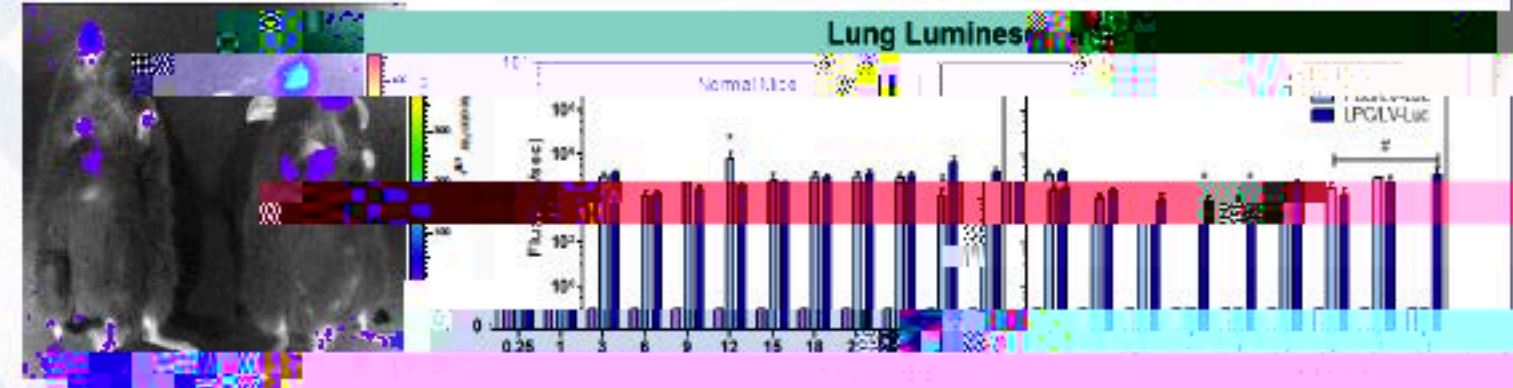


Fig. 1b. LV-luciferase luminescence. CF mice: PBS (left) vs LPC (right)

Fig. 2b. Lung LV-luciferase luminescence. Normal (left) vs CF mice (right). Mice: LPC/LV-Luc. \* $p < 0.05$ , RM ANOVA, n=3-12, # n too low for analysis

## Conclusions

Lentiviral luciferase gene expression was significantly improved in mouse nasal airways, which may, in part, be due to reduced animal numbers affecting statistics at the later time points tested.

## Acknowledgements

www.cure4cf.org