

## **Optimal transfection conditions and the safety profiles of dextran spermine/plasmid DNA as potential gene transfer vector to mouse airway.**

### **ABSTRACT**

The emergence of gene therapy offers a new paradigm to the field of molecular medicine. However, current viral and non-viral gene transfer vectors are not efficient and often restricted by dose-limiting toxicity. Thus, generation of a new gene delivery vector, which is efficient and with good safety profile is highly required. In this study, optimal transfection conditions and safety profile of a novel biodegradable cationic polymer-dextran-spermine (D-SPM) in mouse airways were ascertained. The highest level of gene expression in the lungs of BALB/c mice was detected at D-SPM to plasmid DNA (pDNA) weight ratio (w/w) of 16, with 13.5 µg pDNA. No significant induction of pro-inflammatory cytokines in the broncho-alveolar lavage fluids was observed, which implies no overt toxicity occurred in the mouse lungs. In short, these results demonstrate that D-SPM has moderate gene transfer efficiency but with acceptable safety profile in the mouse airways.

**Keyword:** Optimal transfection; Mouse airways; Gene transfer.