Inhalation of 2, 4-Di-tert-butylphenol-Loaded Micelles Suppresses Respiratory Syncytial Virus Infection in Mice

Ke Zhang¹, Mingyang Guo¹, Jianqing Peng¹, Pengcheng Guo², Qin Wang¹, Huyan Shen¹, Fang Chen¹, Pingping Zhang¹, Siyu Lin¹, Han Gao³, Hong Peng³, Rong Mou¹, Jiandong Huang⁴, Jianxin Wang², and Yu-si Luo³

¹Guizhou Medical University
²Fudan University
³The Affiliated Hospital of Guizhou Medical University
⁴The University of Hong Kong

November 21, 2023

Abstract

Human respiratory syncytial virus (RSV) is a common cause of respiratory infections in infants, young children, and elderly people. However, there are no effective treatments or vaccines available in most countries. In this study, we explored the anti-RSV potential of 2, 4-Di-tert-butylphenol (2, 4-DTBP), a compound derived from Houttuynia cordata Thunb. To overcome the poor solubility of 2, 4-DTBP, we encapsulated it in polymeric micelles and delivered it by inhalation. We found that 2, 4-DTBP-loaded micelles inhibited RSV infection in vitro and improved survival, lung pathology, and viral clearance in RSV-infected mice. Our results suggest that 2, 4-DTBP-loaded micelles are a promising novel therapeutic agent for RSV infection and that micellar delivery can enhance the efficacy of lipophilic drugs.

Hosted file

Figure 1.
Figure 2.
Figure 8.