Supporting Information for

ORIGINAL ARTICLE

Novel approach for real-time monitoring of carrier-based DPIs delivery process *via* pulmonary route based on modular modified Sympatec HELOS

Xuejuan Zhang[a,b,†], Yingtong Cui[a,†], Ruifeng Liang[a], Guanlin Wang[a], Xiao Yue[a], Ziyu Zhao[a,d], Zhengwei Huang[a], Ying Huang[a,c,*], Jianfang Geng[e], Xin Pan[a,*], Chuanbin Wu[a]

[a]*School of Pharmaceutical Sciences, Sun Yat-Sen University, Guangzhou 510006, China*
[b]*Institute for Biomedical and Pharmaceutical Sciences, Guangdong University of Technology, Guangzhou 510006, China*
[c]*School of Pharmaceutical Science, Jinan University, Guangzhou 510006, China*
[d]*Department of Pharmacology, Zhongshan School of Medicine, Sun Yat-Sen University, Guangzhou 510080, China*
[e]*Sympatec GmbH Suzhou Rep. Office, Suzhou 215123, China*
Received 6 December 2019; received in revised form 12 February 2020; accepted 18 February 2020
*Corresponding authors. Tel./fax: +86 20 39943115 (Ying Huang); Tel./fax: +86 20 39943115 (Xin Pan).
E-mail addresses: huangy2007@163.com (Ying Huang), panxin2@mail.sysu.edu.cn (Xin Pan).
†These authors made equal contributions to this work.

Particle Size Distribution

The particle size distribution of LAC and MSS was presented in Fig. S1, which showed a single peak and normal distribution. No fine particle peak and aggregation peak could be detected in LAC and MSS, respectively. It was indicated that MSS and LAC could be distinguished by Sympatec HELOS & INHALER™, which were applicable in the investigation of pulmonary delivery processes in DPIs.

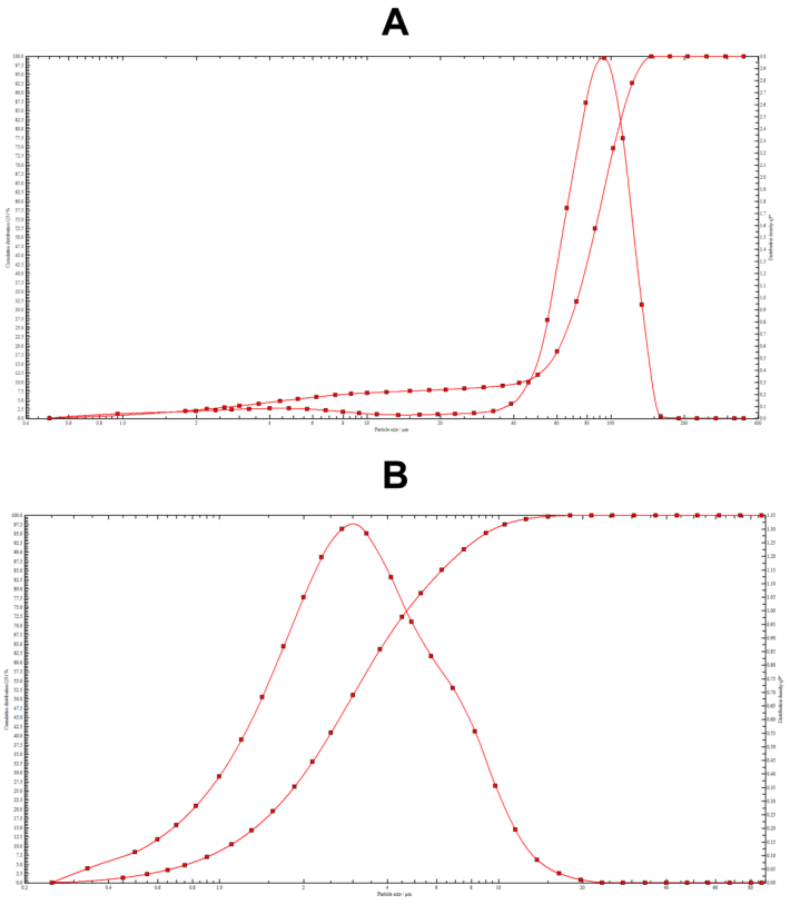

Figure S1 Particle size distribution of (A) LAC; (B) MSS (*n*=3).

In Vitro Aerosolization Performance: NGI

The images of NGI with or without pre-separator were presented in Fig. S2 [1].

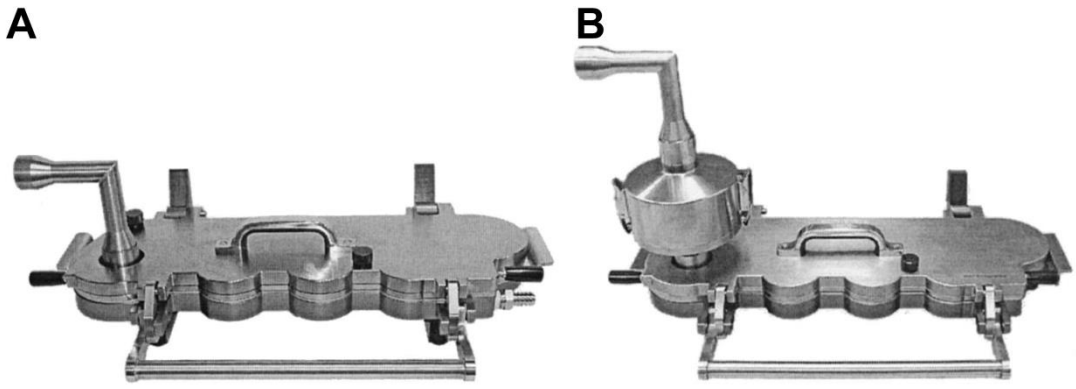

Figure S2 The image of (A) NGI without pre-separator; (B) NGI with pre-separator.

The Correlation between MMSH and NGI was presented in Fig. S3.

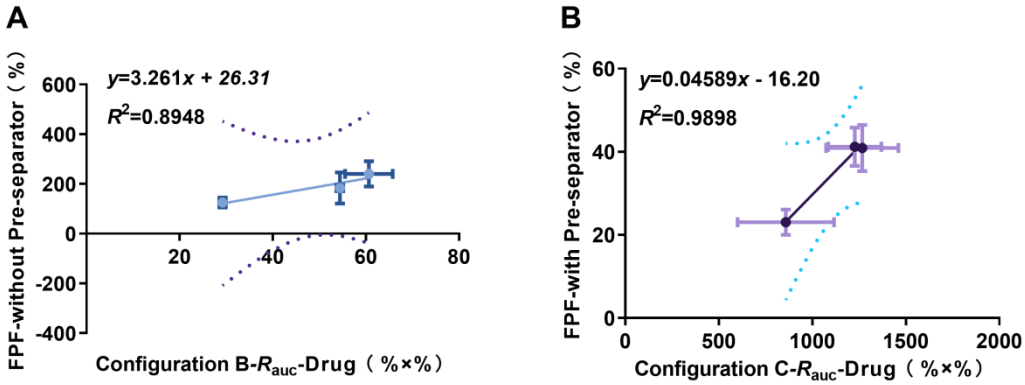

Figure S3 The correlation between (A) FPF of NGI without pre-separator and R_{AUC}-drug of configuration B; (B) FPF of NGI with pre-separator and R_{AUC}-Drug of configuration C (n=3).

Reference

1. Marple VA, Roberts DL, Romay FJ, Miller NC, Truman KG, Van Oort M, et al. Next generation pharmaceutical impactor (a new impactor for pharmaceutical inhaler testing). Part I: Design. *Journal of aerosol medicine : the official journal of the International Society for Aerosols in Medicine* 2003;**16**:283-99.