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Jingliang Dong, Yidan Shang, Kiao Inthavong, Hak-Kim Chan, Jiyuan Tu

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# Partitioning of dispersed nanoparticles in a realistic nasal passage for targeted drug delivery

Jingliang DONG<sup>1</sup>, Yidan SHANG<sup>1</sup>, Kiao INTHAVONG<sup>1</sup>, Hak-Kim CHAN<sup>2</sup>, Jiyuan TU<sup>1,3\*</sup>

<sup>1</sup> School of Engineering, RMIT University, PO Box 71, Bundoora, VIC 3083, Australia.

<sup>2</sup> Advanced Drug Delivery Group, Faculty of Pharmacy, The University of Sydney, NSW 2006, Australia.

<sup>3</sup> Key Laboratory of Ministry of Education for Advanced Reactor Engineering and Safety, Institute of Nuclear and New Energy Technology, Tsinghua University, PO Box 1021, Beijing 100086, China.

\*Correspondence:

Prof. JiyuanTu;

Email: [jiyuan.tu@rmit.edu.au](mailto:jiyuan.tu@rmit.edu.au)

Phone: +61-3-9925-6191;

Fax: +61-3-9925-6108.

## Abstract

The complex nasal structure poses obstacles for efficient nasal drug administration beyond the nasal valve, especially when targeting the olfactory region. This study numerically detailed the naturally inhaled nanoparticle transport process from the initial releasing locations to the final deposited sites using a realistic human nasal passage. Dispersed nanoparticles at different coronal cross-sections were partitioned into multiple groups according to their final deposited locations. Results showed inhaled nanoparticles are more likely to move along the septum. Olfactory deposited particles entered the nose through the inner superior corner of the nostril; the middle meatus deposited particles entered the nose through the top third of the nostril; the inferior deposited particles entered via the bottom floor regions of the nostril. Therefore, targeted nasal inhalation therapies that intentionally release therapeutic particles from these recognized regions at the nostril plane can considerably improve the resultant topical disposition doses. However, it remains challenging

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