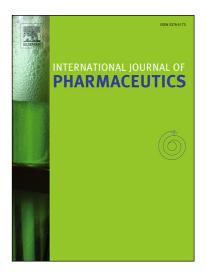
### Accepted Manuscript

Toward Smart Nebulization: Engineering Acoustic Airflow to Penetrate Maxillary Sinuses in Chronic Rhinosinusitis

Shima Jowhari Moghadam, Laurent Navarro, Lara Leclerc, Sophie Hodin, Jérémie Pourchez

PII: DOI:	S0378-5173(18)30348-X https://doi.org/10.1016/j.ijpharm.2018.05.039
Reference:	IJP 17510
To appear in:	International Journal of Pharmaceutics
Received Date:	5 April 2018
Revised Date:	16 May 2018
Accepted Date:	16 May 2018



Please cite this article as: S.J. Moghadam, L. Navarro, L. Leclerc, S. Hodin, J. Pourchez, Toward Smart Nebulization: Engineering Acoustic Airflow to Penetrate Maxillary Sinuses in Chronic Rhinosinusitis, *International Journal of Pharmaceutics* (2018), doi: https://doi.org/10.1016/j.ijpharm.2018.05.039

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## **ACCEPTED MANUSCRIPT**

## Toward Smart Nebulization: Engineering Acoustic Airflow

to Penetrate Maxillary Sinuses in Chronic Rhinosinusitis

Shima Jowhari Moghadam<sup>1</sup>, Laurent Navarro<sup>1</sup>, Lara Leclerc<sup>1</sup>, Sophie Hodin<sup>2,3</sup>, Jérémie Pourchez<sup>1</sup>\*

1 Mines Saint-Etienne, Univ Lyon, Univ Jean Monnet, INSERM, U1059 Sainbiose, Centre CIS, F-

42023 Saint-Etienne France

2 Université de Lyon, F-42023 Saint-Etienne France

3 INSERM, U1059 Sainbiose, Dysfonction Vasculaire et Hémostase, Saint-Etienne France

Correspondence to: Ecole Nationale Supérieure des Mines de Saint-Etienne, Centre Ingénierie et Santé, F-42023 Saint-Etienne, France. Tel.: +33 4 77 42 01 80; fax: +33 4 77 49 96 94. E-mail address: pourchez@emse.fr (J. Pourchez).

#### ABSTRACT

Treating chronic rhinosinusitis (CRS) by nebulization requires an airflow capable to deliver medication to deep target sites beyond the nasal valve. Fixed frequency acoustic airflow technology is currently available, mainly as post-surgical therapy, but still have not been able to realize the full potential of direct nose to paranasal sinuses delivery. Reported herein are the application of frequency sweep acoustic airflow and the optimization of its frequency range, sweep cycle duration and intensity.

The resonant frequencies of the model's maxillary sinuses can be estimated using the Helmholtz resonator theory. Results indicated a resonant frequency of 479 Hz for the right maxillary sinus and one of 849 Hz for the left maxillary sinus. The highest intrasinus Download English Version:

# https://daneshyari.com/en/article/8519689

Download Persian Version:

https://daneshyari.com/article/8519689

Daneshyari.com