Proceedings International
Platinum Open Access Journal (ISSN 2668-6384)

Proceedings, Abstract
Volume 4, Issue 2, 2022, 2
https://doi.org/10.33263/Proceedings42.002

pH-sensitive Microcapsules Containing Clarithromycin-loaded Lipid Nanocarriers for the Treatment of *H. pylori* in Gastric Diseases †

Sofía V. Sánhez [1,2,3], Eva. C Arrua [2], Valeria Trincado [1], Javier O. Morales [1,2,3,*]

[1] Drug Delivery Laboratory, Departamento de Ciencias y Tecnología Farmacéuticas, Universidad de Chile
[2] Advanced Center for Chronic Diseases (ACCDiS)
[3] Center of New Drugs for Hypertension (CENDHY)
* Correspondence: jomorales@ciq.uchile.cl (J.O.M.);
† Presented at The Sixth International Meeting of Pharmaceutical Sciences (RICiFa), November 10-12, 2021, Córdoba, Argentina

Received: 26.04.2022; Revised: 4.05.2022; Accepted: 6.05.2022; Published: 8.05.2022

Abstract: *Helicobacter pylori* (*H. pylori*) is a bacterium involved in the pathogenesis of severe gastric diseases being the most frequent cause of infection-induced cancer worldwide. *H. pylori* colonizes the gastric mucosa increasing its pH from 1-3 to 5-7. Antimicrobial agents, such as clarithromycin (CLA), are essential to eradicate *H. pylori* infection. Thus, the objective of this research is to develop and characterize CLA-loaded lipid nanocarriers (CLA-LNC), incorporate them into alginate-carrageenan microcapsules for pH-specific localized release of CLA, determine the entrapment efficiency (%EE) and the *in vitro* release at pH 2 and pH 4.CLA-LNC was successfully developed by the phase inversion-based process. The physicochemical characteristics of CLA-LNC, such as size (110.2nm), PdI (0.022), and zeta potential (-16.96mV), suggest a stable system with suitable characteristics for drug delivery. pH-sensitive alginate-carrageenan microcapsules containing CLA-LNC were obtained by complex coacervation. The %EE of CLA in the LNC was 85.73%, and microcapsules were able to encapsulate 76.87% of CLA-LNC, revealing high incorporation of CLA in both systems. Moreover, the poor release of CLA from microcapsules at pH 2 (about 20%) and the effective release at pH 7.4 suggest that this is a promising formulation for the administration of CLA to *H. pylori* treatment in gastric diseases.

Keywords: clarithromycin; lipid nanocarriers; pH-sensitive microcapsules; gastric diseases.

Funding

This work was funded by Regular FONDECYT Project 1181689, ANID/PIA/ACT192144, ANID/PCI/REDI170653, FONDAP Project 15130011, National Doctoral Scholarship 21201831, all granted by Chilean National Agency for Research and Development (ANID).

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.