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

Proceedings, Abstract
Volume 4, Issue 2, 2022, 68
https://doi.org/10.33263/Proceedings42.068

Mixed Nanomicelles for Co-delivery of Paclitaxel and Nelfinavir: Preparation and *In vitro* Characterization †

Ezequiel Bernabeu [1,5,*], Mariángeles Díaz [2], Jenifer Riedel [1], Silvina Lompardía [2], Eduardo Lagomarsino [3], Juan Lázaro Martinez [4], Liliana Alarcon [5], Marcela Moretton [1,5], Diego Chiappetta [1,5]

1 Universidad de Buenos Aires, Facultad de Farmacia y Bioquímica, Cátedra de Tecnología Farmacéutica I, Buenos Aires, Argentina; bernabeu.uba@gmail.com (E.B.); jenn.driedel@gmail.com (J.R.); marcelamoretton@gmail.com (M.M.); diegochiappetta@yahoo.com.ar (D.C.)
2 CONICET-Universidad de Buenos Aires, Instituto de Estudios de la Inmunidad Humoral (IDEHU), Departamento de Microbiología, Inmunología, Biotecnología y Genética, Buenos Aires, Argentina; mariangeles.ds@gmail.com (M.D.); sil.lompardia@gmail.com (S.L.)
3 Universidad de Buenos Aires, Facultad de Farmacia y Bioquímica, Departamento de Farmacología, Buenos Aires, Argentina; edulagoma@gmail.com (E.L.)
4 CONICET - Universidad de Buenos Aires, Instituto de Química y Metabolismo Del Fármaco (IQUIMEFA), Departamento de Química Orgánica, Facultad de Farmacia y Bioquímica, Buenos Aires, Argentina; jmlazaromartinez@gmail.com (J.L.M.)
5 Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina; lilipaola@gmail.com (L.A.)
* Correspondence: bernabeu.uba@gmail.com (E.B.);
† 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: Drug repurposing represents a growing trend to discover new indications of already existing drugs. Nelfinavir (NFV), an HIV protease inhibitor, has been shown to have potential sensitization effects when co-administered with antineoplastic drugs. In this study, we prepared micelles of Soluplus® and D-α-tocopheryl poly(ethylene glycol) succinate (TPGS) for the co-delivery of paclitaxel (PTX) and NFV to enhance the anti-cancer activity of PTX in human leukemic cell lines (Jurkat, K562 and Kv562). The images from transmission electron microscopy showed that PTX-NFV-loaded (2 mg/mL and 5 mg/mL) micelles were spherical in shape. The average particle size measured by dynamic light scattering was found to be close to 60 nm. The ^{1}H NMR measurements confirmed the incorporation of PTX and NFV into the micelle. A stability study of freeze-dried micelles, which was performed by monitoring drug content and particle size, demonstrated good storage stability for at least 3 months at room temperature. Also, micelles exhibited dose-dependent hemolytic effects in mouse erythrocytes. Assessment of cell viability using MTS assay indicated that drug-resistant Kv562 cells were more sensitive to PTX-NFV-loaded micelles, exhibiting an approximately 7-fold greater decrease in viability than PTX solution, as evaluated by the IC_{50} value ($p < 0.05$) after 48 h. Therefore, Soluplus®-TPGS micelles could be a promising nanocarrier for the co-delivery of PTX and NFV.

Keywords: micelles; Paclitaxel; Nelfinavir; co-delivery; cancer cells.

Funding

This research was funded by Universidad de Buenos Aires, grant UBACyT 20020190200398BA, UBACyT 20020170100362BA and PIDAE 2018 (SP28 – FFYB - CHIA).

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.