

MicroRNA releasing lipoplexes as potential nanosystems against COVID 19

Original

MicroRNA releasing lipoplexes as potential nanosystems against COVID 19 / Nicoletti, Letizia; Paoletti, Camilla; Tarricone, Giulia; Divieto, Carla; Andreana, Ilaria; Stella, Barbara; Arpicco, Silvia; Mattu, Clara; Chiono, Valeria. - ELETTRONICO. - (2020), pp. 24-24. ((Intervento presentato al convegno Virtual FISV Symposium on SARS CoV 2 Biology and COVID 19: Current research and perspectives.

Availability:

This version is available at: 11583/2872069 since: 2021-02-19T18:50:17Z

Publisher:

Federazione Italiana Scienze della Vita

Published

DOI:

Terms of use:

openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

MicroRNA-releasing lipoplexes as potential nanosystems against COVID-19

L. Nicoletti^{1,2,3}, Camilla Paoletti^{1,2,3}, G. Tarricone^{1,2,3}, C. Divieto⁴, I. Andreana⁵, B. Stella⁵, S. Arpicco⁵, C. Mattu^{1,2,3}, V. Chiono^{1,2,3}

¹Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Turin, Italy

²Interuniversity Center for the promotion of the 3Rs principles in teaching and research, Turin, Italy

³POLITO Biomedlab, Politecnico di Torino, Turin, Italy

⁴Division of Metrology for Quality of Life, Istituto Nazionale di Ricerca Metrologica, Turin, Italy

⁵Department of Drug Science and Technology, University of Turin, Turin, Italy

Coronavirus disease 2019 (COVID-19) has become a global pandemic. Currently, in the lack of COVID-19 treatments and vaccines, the therapeutic potential of microRNAs as anti-viral can be exploited. Here, we developed new miRNA-loaded lipoplexes for efficient encapsulation and gradual miRNA release as nanosystem against COVID-19. Lipoplexes containing negmiR were formulated at different N/P ratios from 3.0 to 0.35 showing encapsulation efficiency of 99%, an average hydrodynamic diameter ranging from 372 nm to 876 nm and an average zeta potential ranging from +40 mV to -26 mV by decreasing the N/P ratios. Based on stability experiments at different temperatures, lipoplexes with 3 N:P ratio was selected for *in vitro* test, showing biocompatibility and efficient *in vitro* miRNA release, as compared to a commercial agent. In conclusion, new lipoplexes were developed showing efficient miRNA delivery to cells. In future, miRNA-loaded lipoplexes will be evaluated as potential therapeutic nanosystems against COVID-19. This project is supported by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 772168).