ELECTRIC AND MECHANICAL PROPERTIES OF IONIC LIPOPLEXES
Carlos I. Ochoa-Sánchez, Juan M. Molina-Jiménez, Ramon A. Iñiguez-Palomares, Ericka Rodríguez-León, Eduardo Larios-Rodríguez, César Rodríguez-Beas

1Physics Department, University of Sonora, Blvd. Luis Encinas and Rosales S/N, Col. Centro, ZIP code: 83000, Hermosillo, Sonora, México.
2Chemical Engineering and Metallurgy Department, University of Sonora, Blvd. Luis Encinas and Rosales S/N, Col. Centro, ZIP code: 83000, Hermosillo, Sonora, Mexico.

Lipoplexes (liposomes/DNA) are the non-viral vectors most used in transfection owing to their protective action on the gene and ability to introduce it into the target cell. However, despite recent progress in relation to the use of lipoplexes in gene therapy, the use of these genetic vehicles is still in an early stage because they have a low transfection capacity with regard to the viral vectors. Nonetheless, a good understanding of the physicochemical properties [1] of the lipoplexes would contribute significantly to the increase in their rates of transfection. Accordingly, the main objective of this work is to carry out an electric and mechanical characterization of both cationic lipoplexes (cationic liposomes (CL)/DNA) [2] and anionic (anionic liposomes (ALs)/cations/DNA) [3], and to know their ability to be used as non-viral delivery vectors. Based on a previous study on CL-DNA lipoplexes [2], the characterization of lipoplexes will be carried out by mixtures of CL (DODAB) with DNA (Calf Thymus) and ALs (DOPS) / zwitterionic lipids (DOPC) with DNA. To this end, calcium (Ca$^{2+}$) cations are used as a linkage between ALs and DNA (both negatively charged). The study of these two systems offers new insight into the interaction between CL/DNA and ALs/Ca$^{2+}$/DNA which in turn, becomes decisive to understand the behaviour of the resulting complexes.

Keywords: Liposomes, DNA, Lipoplexes

References:

Presenting author’s email: cesaragosto@ciencias.uson.mx