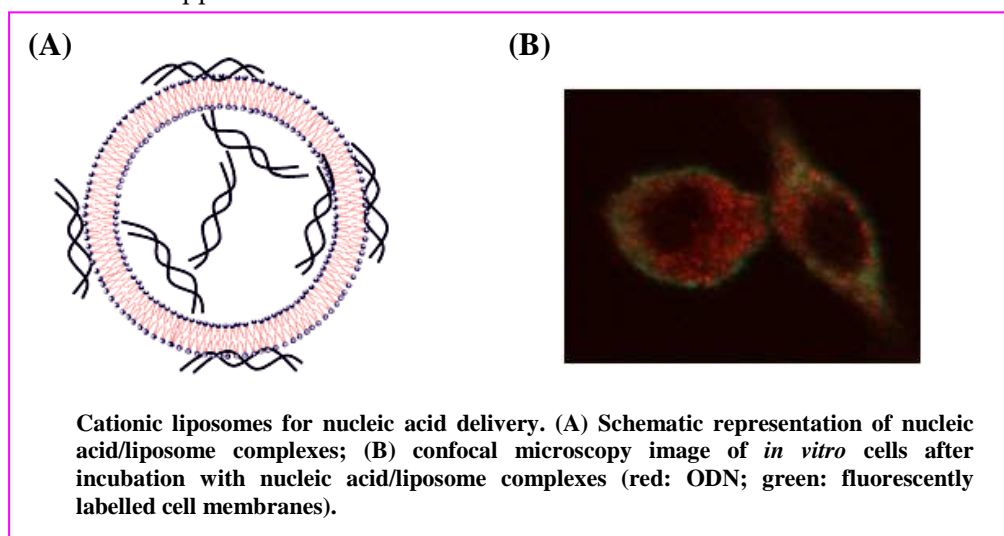


New liposome-based systems for nucleic acid delivery

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The group of Pharmaceutical technology at University of Naples has been developing new liposomal formulations for nucleic acid delivery. Such systems have shown a high cell uptake, together with a limited cytotoxicity, compared with other liposome-based products available on the market. The group is looking for industrial partners or research institutes interested in developing this technology for pharmaceutical, medical or biochemical applications.



1. Description of the product

The product consists on new cationic liposome-based formulations for nucleic acid delivery. In particular, the product has been developed by using newly-synthesized cationic lipids, in association with different *helper lipids*. The use of this product allows to achieve an efficient nucleic acid delivery together with a limited cytotoxicity. In cell culture experiments, an oligonucleotide decoy to transcription factor NF- κ B, complexed with these new cationic liposomes, provided for a significant reduction of NF- κ B activation in activated macrophages. The oligonucleotide, at the same dose or delivered by marketed cationic liposomes, did not show any effect.

2. Innovative aspect of the product

Liposomes for nucleic acid delivery, compared to viral vectors, offer advantages such as easy preparation, limited costs, no risks of allergic reactions or reactivation of the viral vector. Different cationic liposome-based formulations are today on the market. However, their use is today limited to the improvement of nucleic acid delivery in cell culture. This is due to the relatively low nucleic acid uptake into cells, compared with that obtained with viral vectors. Moreover, also toxicity of liposome-based marketed formulations strongly hampers their *in vivo* use. The proposed technology consists in designing and processing of liposomes based on newly-synthesised lipids. These liposomes have been opportunely formulated to conjugate a lower toxicity and a higher nucleic acid cell penetration, compared to other cationic liposome-based formulation present on the market. The technology could be advantageous for biochemical, as well as for biomedical applications.

3. Main advantages of the offer

The proposed technology could represent a valid alternative to marketed cationic liposome-based products as delivery systems for nucleic acids. Moreover, due to the low toxicity, the system can be proposed for further *in vivo* studies.

4. Technology key words

Nucleic acid, Oligonucleotide; Cationic lipids; Cell uptake; Cytotoxicity.

5. Current Stage of Development

Development phase – laboratory tested

6. Intellectual Property Rights

Partnership/other contractual agreements.

Technical and scientific publications

Liposomes based on a new cationic lipid: delivery of a decoy oligonucleotide against NF- κ B transcription factor. G. De Rosa, S. Arpicco, M.C. Maiuri, V. Laguardia, R. Carnuccio, M.I. La Rotonda, E. Fattal. 2005 *Controlled Release Society 32nd Annual Meeting & Exposition*, 18-22 June 2005, Miami Beach, Florida.

Delivery of a decoy oligonucleotide against NF- κ B by new cationic liposomes. G. De Rosa, V. Laguardia, S. Arpicco, M.C. Maiuri, D. De Stefano, R. Carnuccio, M.I. La Rotonda, E. Fattal. *5th World Meeting on Pharmaceutics BioPharmaceutics and pharmaceutical technology*, Geneva, Switzerland 27-30 Marzo 2006.

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