Soft self-assembled nanostructured nanoparticles for gene and drug delivery

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Abstract

Formulations based in lipid systems (e.g. liposomes) hold the promise of becoming safe and efficient delivery systems for drugs and genes in therapeutic applications [1]. Yet, the efficiency of such systems is still relatively low and further progress in the technology is needed to achieve the required performance for therapeutic applications.

In this presentation I will talk about our recent advances in the development of novel methodologies capable of making soft self-assembled nanoparticles of controlled size and nanostructure, and which are capable of incorporating polar and apolar drugs simultaneously.

Particular emphasis is placed on the development of novel microfluidic-based methods to aid in the assembly process. These devices allow not only a versatile and automated way of producing nanocarrier particles of controlled size and distribution, but also to take advantage of the out-of-equilibrium nature of flow to further manipulate the materials and produce novel complex structures of therapeutic interest.

References

[1] T.M. Allen, P.R. Cullis, Adv. Drug Deliv. Rev., 65 (2013) 36