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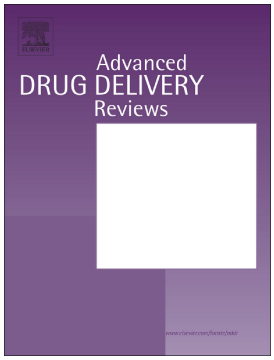

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James P.K. Armstrong, Molly M. Stevens

PII: S0169-409X(18)30156-X
DOI: doi:10.1016/j.addr.2018.06.017
Reference: ADR 13327

To appear in: *Advanced Drug Delivery Reviews*

Received date: 11 March 2018
Revised date: 21 May 2018
Accepted date: 22 June 2018

Please cite this article as: James P.K. Armstrong, Molly M. Stevens , Strategic design of extracellular vesicle drug delivery systems. Adr (2018), doi:10.1016/j.addr.2018.06.017

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Strategic design of extracellular vesicle drug delivery systems

James PK Armstrong[1] & Molly M Stevens[1*]

[1] Department of Materials, Department of Bioengineering, and Institute for Biomedical Engineering, Imperial College London, London, SW7 2AZ, United Kingdom.

* Corresponding author email address: m.stevens@imperial.ac.uk

ABSTRACT

Extracellular vesicles (EVs), nanoscale vectors used in intercellular communication, have demonstrated great promise as natural drug delivery systems. Recent reports have detailed impressive *in vivo* results from the administration of EVs pre-loaded with therapeutic cargo, including small molecules, nanoparticles, proteins and oligonucleotides. These results have sparked intensive research interest across a huge range of disease models. There are, however, enduring limitations that have restricted widespread clinical and pharmaceutical adoption. In this perspective, we discuss these practical and biological concerns, critically compare the relative merit of EVs and synthetic drug delivery systems, and highlight the need for a more comprehensive understanding of *in vivo* transport and delivery. Within this framework, we seek to establish key areas in which EVs can gain a competitive advantage in order to provide the tangible added value required for widespread translation.

KEY WORDS

Drug Delivery; Extracellular Vesicles; Exosomes; Microvesicles; Liposomes

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