Tentative Outline

New trends in gene therapy: multidisciplinary approaches to siRNAs controlled delivery

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Aims & Scope:

Gene therapies (GTs), powerful in principle, can be of great importance for health care applications if and only if effective delivery systems are available. Among the GTs, the one based on siRNAs delivery shows revolutionary potentiality due to the genes silencing mechanism in pathologies. Thus, they have huge therapeutic potentials, even in the treatment of life threatening diseases. However, the use of siRNAs is limited because of some inconveniences: they are large macromolecules, negatively charged, that undergo rapid degradation by plasma enzymes, are subjected to fast renal clearance/hepatic sequestration and can hardly cross cellular membranes. These aspects seriously impair siRNAs usability. The only way to overcome these obstacles is to face out the scientific problems through a multidisciplinary approach, integrating all relevant and necessary expertise.

In this Full-Thematic Issue of the journal Current Drug Delivery, the problem of the siRNAs delivery is described from several points of view, by several research groups which have been jointly working on the subject in the last years.

The Issue will be organized covering:

1) the biomedical aspects of the use of siRNAs, mainly for silencing the transcription factor E2F1 and cyclin D1, these last being involved in the development of human solid tumors and inflammatory diseases;
2) the design and development of innovative technologies (based on new polymers and liposomal structures) able to successfully deliver siRNAs into their target tissues and cells; and
3) some engineering aspects of the problem, such as the advanced characterization of delivery systems, the behavior of vectors in blood flow field, the pharmacokinetics of the vectors and of the drugs, the mathematical modeling of relevant phenomena involved in drug delivery.

Key words:

Gene therapy, controlled release, polymeric nano particles, lipid nano particles, inorganic nano particles, hydrogels, microfluidic, pharmacokinetics

Subtopics of interest include, but are NOT limited to:

(I) Biomedical aspects of siRNA therapy, in-vivo models;
(II) Nano delivery systems: materials and preparation techniques;
(III) Hydrogels in gene therapy;
(IV) Engineering aspects: microfluidic, in-vitro models;
(V) Engineering aspects: pharmacokinetics, in-silico models.

Schedule:

Manuscript submission deadline:	**30 September 2015**
Peer Review Due:	**30 November 2015**
Revision Due:	**20 December 2015**
Notification of acceptance by the Guest Editor:	**31 December 2015**
Final manuscripts due:	**31 January 2016**