

The Creation of a New Journal in the Crucial Field of Drug Delivery

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Editorial

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EDITORIAL

With an ever-growing number of drug candidates and therapeutic agents in the pre-clinical pipeline, drug delivery has become perhaps the most important checkpoint during the drug development process. In the recent years, large hydrophobic molecules increasingly emerge with strong therapeutic potential, but unfortunately limited by their low aqueous solubility, subsequently resulting to slow intestinal absorption, rapid blood elimination, short *in vivo* half-life, and non-specific activity. Drug delivery comes to answer these unmet needs, by providing innovative solutions with novel drug carriers, protecting and delivering molecules with unfavorable physicochemical properties, while reducing their potential toxicity and side effects, through enhanced tissue specificity and active targeting. Furthermore, alternative routes of administration have been utilized as viable solutions for administering topically or systemically compounds, such as nasal, pulmonary and transdermal delivery that in the recent years have been receiving significant attention ^[1,2].

Among the several drug delivery approaches, micro- and nanotechnology have emerged as game changers and have permitted us to envision new ways for the treatment of several types of diseases and, most importantly, for the control of cancer. An example of these innovative methodologies are the microneedle patches, which have provided solutions regarding the topical and/or systemic administration of molecules that would otherwise be impossible to diffuse through and across the stratum corneum and the skin barrier ^[3].

On another important research area, drug delivery has made significant contributions on gene therapy, which in turn has revolutionized our understanding and the treatments of numerous diseases, including cancer. Our recent understanding of molecular biology and the use of nucleic acid-based treatments to directly modify pathway activation by introducing, modifying or regulating the expression of genes, has allowed us to complement traditional chemotherapies and develop novel approaches to treat or potentially prevent diseases. However, gene delivery was limited by poor bioavailability, short half-life and limited transfection efficiency *in vivo* ^[4]. Viral and non-viral gene delivery approaches, such as cationic liposomes and polymers, overcame many of these limitations, eventually leading to clinical trials ^[5-7]. Undeniably, these drug delivery approaches are the instrumental tool for the successful translation of gene therapy to patient treatment.

Another example that demonstrates the importance of drug delivery is the delivery of molecules to the brain, molecules that would otherwise not cross the blood-brain-barrier (BBB), a number of physiological, and biochemical obstacles that prevent molecules from entering the brain area. Drug modification, drug encapsulation inside nanocarriers, and targeting of certain receptors, such as the Transferrin receptors, have allowed for new molecules to more readily cross the BBB and opened new therapeutic avenues ^[8,9].

All of the aforementioned examples briefly demonstrate the vast importance that drug delivery has and will continue to have for drug development and patient treatment. It is evident that the creation of the new journal "Research & Reviews: Drug Delivery" comes at a time of intensive research on drug delivery technologies. This journal's goal to be a source for new research and review papers will be instrumental in the development of new methodologies and their clinical translation. More importantly, the open-access nature of the Journal will significantly help on the dissemination of the newly acquired knowledge and the experience of seasoned researchers.

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