

Tentative Outline
Special Issue for CURRENT DRUG Targets
Guest Editor: Anton FICAI

Smart Drug Delivery Systems

Drug delivery systems are extensively studied from design to preclinical and clinical level. The main challenges in this fields are strongly related to the control of the delivery and thus, to try to mimic the ideal drug delivery systems. Unfortunately, the exact amount of the drug the release profiles and rate, the targeted delivery of the active component exclusively into the desired tissue/organ as well as many other characteristics are not yet achieved. The smart drug delivery systems must be able to deliver the targeted amount of active component, at the desired tissue/organ with an adaptive delivery rate which depends on the actual need of the patient. Besides the classical drug delivery systems, new drug delivery devices, fully or partially automated are tested at preclinical and clinical level. In these cases the delivery characteristics can be controlled in a predefined manner or, it can be controlled in an adaptive way. The control of the delivery rate during the treatment is very important especially in the case of toxic active components (cytostatics, antibiotics, etc.). More than, at recent times, the long term influence of many medical devices, materials and formulations are necessary to be studied. The delivery mechanism is extremely important.

Two main delivery mechanisms can be identified, based on the nature of the driving force. Based on this, two mechanisms of delivery/control can be identified:

- internal control or induced by the evolution of the physico-chemical characteristics of the body/organ/tissue (pH changes along with the gastric tract, for instance, can be useful for the targeted delivery in colon instead of stomach or, in the case of pH, the more acidic pH lead to a stronger delivery at the targeted tissue) or
- external control (different sensors are used for monitoring the health status and, based on the obtained results, externally forces are applied to modify the delivery rate, for instance hyperthermia is produces and, due to the increasing temperature, the delivery rate is increased). The information exchange can be done periodically or continuously.

This special issue will be focused on several subtopics, including but not limiting to:

- pH, thermal or ion sensitive drug delivery systems;
- external control of the delivery process;
- targeted delivery of biological active components;
- drug delivery systems for cancer treatment;
- drug delivery systems for antimicrobial applications;
- drug delivery devices: from design to applications;
- surface modification of the filler;
- benefits versus shortcomings related to the use of drug delivery systems.

Key words: drug delivery systems, delivery control, cancer treatment, antimicrobial drug delivery systems, nanomaterials and nanotechnology.

Tentative deadlines:

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