University of Zurich[UZH]

Institute for Regenerative Medicine (IREM)

Colloquium

Clinical Colloquium Regenerative Medicine

Thursday, 5th July 2018 at 1–2pm,
Institute for Regenerative Medicine (IREM),
University of Zurich, Wagistrasse 12,
WAD-904 (Founders Lab), 8952 Schlieren

Prof. Massimo Morbidelli

Institute for Chemical and Bioengineering, Department of Chemistry and Applied Biosciences, ETH Zürich, Switzerland

Versatile Macromolecules and their Biomedical Applications

Polymer reaction and colloidal engineering have reached a level of maturity allowing us to synthesize macromolecules and small particles covering very wide and often even overlapping ranges of sizes and compositions. On the other hand, the number of potential applications in various areas is very large, and the limiting step is probably mostly in our capability to imagine a “certain” structure to solve a “certain” problem. In this presentation we discuss through a number of examples in the biomedical area, how to define the properties that a material should have to solve a certain problem, and then how to synthesize the corresponding macromolecule.

In particular, we focus on a class of polymers exhibiting a comb-like structure, where the pendants have a chemical composition, length and order along the backbone that can be accurately controlled. These materials have high biocompatibility (FDA approved), are biodegradable and therefore do not accumulate in the organism, and their hydrophilicity/hydrophobicity can be tuned so as to maximize their affinity to various drugs. In addition they can be prepared in the form of nano or micro particles to improve their efficacy in drug delivery applications.

Specific applications will be discussed in the area of drug delivery and tissue engineering. For each of them it is shown how the structure of the macromolecules exhibiting the necessary properties can be defined and synthesized.

Organiser: Prof. Dr. Dr. Simon P. Hoerstrup / Prof. Dr. Roger M. Nitsch
Execution/Chair: Dr. Steffen M. Zeisberger / Dr. Christian Tackenberg
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