

Polymerteknisk Selskab, PTS

Danish Society for Polymer Technology

Polymers in Drug Delivery

Tuesday 15 June 2010, 9.00 am – 4.00 pm
at IDA, House of Engineers, Kalvebod Brygge 31 – 33, Copenhagen

New technological development in polymer-based encapsulations and controlled drug release systems offers possibilities for optimizing the administration of drugs. These improvements contribute to make medical treatment more efficient and to minimize side effects and other types of inconveniences for patients.

From a commercial point of view it may also be of interest to extend the patent protection of a company's "blockbuster" by inventing new routes of administration of the drug.

The conference brings into focus the exciting and innovative perspectives within polymer-based systems for drug delivery and medical device-drug combination products, including nano-encapsulation of active pharmaceutical ingredients (API), controlled release devices, programmable hydrogels, medical chewing-gum, Danish invented silicone-based medical devices with reduced risk of infection, and much more. You will also get the chance to hear about the huge gap between remarkable laboratory products and commercial success.

The conference program features expert speakers from the chemical and pharmaceutical industries as well as national and international research organisations.

Besides the possibility of gaining knowledge regarding new administration systems of API's, you'll also get a chance for networking and perhaps setting up individual appointments with speakers and other participants during the coffee breaks and lunch.

We look forward to meeting you.

The conference language is English.

Programme:

09.00 **Coffee and registration**

09.25 **Welcome / Professor Søren Hvilsted, DTU**

09.30 **Biological and Synthetic Polymers in Drug-delivery and Biotechnology: State-of-the-art, Challenges and Promises**
Dr. habil. **Jean-François Lutz**, Research Group Nanotechnology for Life Science, Fraunhofer, Institute for Applied Polymer Research

In the present lecture, the importance of natural and synthetic macromolecules in biosciences will be highlighted. In particular, some promising examples of polymer-based systems currently used in drug-delivery, protein-delivery, gene therapy and diagnostics will be described. One important objective of this lecture will be to highlight the gap between fundamental polymer research and “real” marketable systems. Although the number of publications increases every year in this important field of research, the paths between polymer laboratories and clinics remain long and tortuous.

10.15 Polymeric nanoparticles for delivery of gene silencing therapeutics

Associate Professor, **Kenneth Howard**, Interdisciplinary Nanoscience Center (iNANO), Aarhus University

The ability to utilise synthetic small interfering RNA (siRNA) duplexes to interrupt gene expression is an exciting strategy to silence genes implicated in human disease. Delivery, however, is a key determinant in realising the full clinical potential of RNA interference. Nanoparticle-based technology for overcoming extracellular and intracellular barriers to siRNA will be discussed with focus on a chitosan/siRNA nanoparticle system developed at iNANO

11.00 Break.

11.15 PLA-PEO vesicles for drug delivery

Ph.D., Research Scientist, **Michael Stolzenburg**, Chempilots a/s

Amphiphilic block-copolymers synthesized by anionic polymerisation are designed to form vesicles in aqueous solution. These vesicles are used to encapsulate both hydrophilic and hydrophobic compounds. A build-in release mechanism is realised by using lactic acid in the block copolymer structure.

12.00 Lunch

13.00 Smart Hydrogels for drug delivery

Ph.D., Consultant, **Anne Louise Nielsen**, Chemistry & Biotechnology, TI Århus

Hydrogels are polymer-based systems with a variety of fascinating properties due to their high water content and great “flexibility”. They can be used for drug delivery as intelligent/ smart hydrogels with controllable release of drug by exogenous triggers such as heat, light and chemical compounds.

13.30 Considerations in selection of materials for drug delivery, some practical aspects

Ph.D., Research Scientist, **Rüya Eskimergen Nielsen**, Novo Nordisk

Materials in direct or indirect contact with the drug or human tissue should be suitable for sterilization, biocompatible and compatible with the drug. Systematic selection of the best material ensures optimal performance over the product life time and a safe product for the patients/ users. A number of generic screening tests are conducted for comparison of the candidate materials. From this step to final material selection; a good collaboration between the materials specialist, designers, drug experts, toxicologists, leachables & extractables analysis experts, regulatory professionals and materials suppliers, is essential. The presentation aims to give a brief overview of materials selection practices for protein delivery devices at Novo Nordisk.

14.00 Medical chewing gum in drug delivery
Senior Scientist, **Carsten Andersen**, Fertin Pharma A/S

Short presentation of Fertin Pharma A/S.

A presentation of medical chewing gum and the benefits of using it as a delivery system. The presentation will include general information on different types of medical chewing gum, their compositions including the polymer system (the gum bases) used in the formulation. Besides, a number of examples will show more specific how changes in formulation and processing parameters influence different product properties like release, stability and taste.

14.30 Break.

15.00 Spray dried siRNA loaded PLGA nanoparticles for pulmonal delivery
Associate Professor, Ph.D., **Hanne Mørck Nielsen**, Faculty of Pharmaceutical Sciences, University of Copenhagen.

The potential for using small interfering RNA (siRNA) for local treatment of autoimmune diseases and infections is promising due to the specificity and potency of siRNA. In general, several chemical and physiological barriers challenge efficient delivery to the diseased cells and to the target site inside the cells. Nanotechnology-based delivery systems seem to represent a solution for intracellular delivery of siRNA. However, delivery to the appropriate site in the airway system must be dealt with separately. Our nanocomposite delivery system for delivery of siRNA to the lungs will be described.

15:30 Use of sCO₂ for making IPN silicone based medical devices
Project Manager, M.Sc. Chem. Eng., **Robert Lessèl**, Chempilots a/s

Supercritical carbon dioxide (sCO₂) can be used as a “sophisticated” solvent in impregnation processes for manufacture of IPN based polymeric systems. These IPN silicone systems can be used as example in manufacturing of catheters for long-term use. This presentation gives a general introduction to sCO₂ processing, equipment and possibilities. As a specific example, new Danish activities within the field of making medical devices with reduced risk of bacterial infection are discussed.

16:00 Closing remarks and end of the day.

For further details about the conference, please contact:

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Participant Fees:

PTS members	DKK 1.500
IDA members	DKK 1.700
Others	DKK 1.900
IDA-student members and unemployed IDA-members	DKK 100
IDA-senior members	DKK 250

Participation according to IDA rules.

Registration: Not later than Friday 11 June 2010 to IDA at Phone +45 33 18 48 18 or electronically at www.ida.dk – Meeting no. 101489. If you do not understand Danish, you can also register to Helle Borch hbo@ida.dk

If you wish to know more about PTS, please see our website at www.ida.dk/pts

Yours sincerely

The Board of Directors