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Model of Nanoparticles Transport across the human Blood-Brain-Barrier Microvasculature

Original

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Delivering Therapeutics Across Biological Barriers (E1)

Organizer(s) David Brayden, Claus-Michael Lehr and Kathryn Whitehead

May 6—9, 2019

Royal Dublin Society • Dublin 4, Ireland

Discounted Abstract Deadline: Jan 8, 2019

Abstract Deadline: Feb 6, 2019

Scholarship Deadline: Jan 8, 2019

Discounted Registration Deadline: Mar 6, 2019

Organized in Collaboration with Science Foundation Ireland

Sponsored by Astellas Pharma Inc.

Summary of Meeting:

The multi-disciplinary theme of crossing of biological barriers encompasses biology, chemistry, pharmaceutical formulation, polymeric and materials science, advanced cell biology imaging, microfluidics, and drug-device combination research. This conference occurs at the interface between cell biology and the use of technologies to exploit such understanding in order to translate therapies to patients. The program comprises leading researchers from academia, institutes, as well as from the pharmaceutical and medical device industry. The goal of the conference is to profile cutting edge research in specific areas of achieving drug delivery across biological barriers where a large translational impact would result for both industry and patients. By inviting cell biologists, technology developers, and formulators to the same conference, this will provide in depth discussions and offer a thorough perspective on the tissue and cell barriers that must be crossed in order to help guide technology approaches to achieve these breakthrough treatments.

View Scholarships/Awards ([index.cfm?e=Web.Meeting.PastScholarships&Meetingid=1647](https://tks.kestonesymposia.org/index.cfm?e=Web.Meeting.PastScholarships&Meetingid=1647))

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Conference Program [Print](#) | [View meeting in 24 hr \(international\) time \(index.cfm?e=Web.Meeting.Program&MeetingID=1647&pTime=international\)](#)

The meeting will begin on Monday, May 6 with registration from 16:00 to 20:00 and a welcome mixer from 18:00 to 20:00. Conference events conclude on Thursday, May 9 with a closing plenary session from 17:00 to 19:15, followed by a social hour and entertainment. We recommend return travel on Friday, May 10 in order to fully experience the meeting.

MONDAY, MAY 6

4:00—8:00 PM

Arrival and Registration

Concert Hall Foyer

This meeting took place in 2019

For a complete list of the meetings for the upcoming/current season, see our **meeting list** (<https://www.kestonesymposia.org/ks/Online/Conferences/Online>) or search for a meeting.

6:00—8:00 PM

Welcome Mixer

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Hall 6

TUESDAY, MAY 7

8:00—8:30 AM

Poster Setup

Hall 6

8:30 AM—7:00 PM

Poster Viewing

Hall 6

8:30—8:40 AM

Welcoming Remarks (Organizers)

8:40—11:30 AM

Delivery Across Mucosal Sites: Oral and Pulmonary

Concert Hall

* **Claus-Michael Lehr**, Helmholtz-Institute for Pharmaceutical Research Saarland, Germany

David Brayden

(<https://people.ucd.ie/david.brayden>),

University College Dublin, Ireland

Oral Peptide Delivery Using Intestinal

Permeation Enhancers and

Nanoparticle Technology

Stephen Timothy Buckley, Novo

Nordisk A/S, Denmark

Short Talk: Gastric Absorption of a Fatty

Acid-Acylated Analog of Glucagon-Like

Peptide-1 (GLP-1)

Anja Boisen

(<http://www.idun.dtu.dk>), Technical

University of Denmark, Denmark

Oral Drug Delivery Using Micro Devices

Coffee Break**Chris Porter**, Monash University,

Australia

Lipidated Drugs and Lipid-Based

Formulations to Improve Solubility and

Oral Bioavailability of BCS Class II

Molecules

Anthony J. Hickey, University of North

Carolina at Chapel Hill, USA

Biopharmaceutical Considerations in

Pulmonary Drug Delivery

Daria Anna Korejwo, University of

Fribourg, Switzerland

Short Talk: Interaction of Graphene-

Related Materials with Cells of the

Human Alveolar Tissue Barrier

11:30 AM—12:30 PM

Lunch

Hall 6

12:00—2:30 PM

Poster Session 1

Hall 6

2:30—4:30 PM

Workshop 1: Nanoparticles in Discovery: Characterization and Mode of Action

Concert Hall

* **Caitriona O'Driscoll**, University

College Cork, Ireland

Kenneth A. Dawson, University
College Dublin, Ireland
*Characterization Techniques for
Nanoparticles*

Orlagh Feeney, Monash University,
Australia
*Breaking Down Barriers: The Impact of
Stromal Remodification on Nanoparticle
Distribution in vivo*

Morag Rose Hunter, AstraZeneca, UK
*Investigating the Role of the
Phosphatidylinositol Pathway in Lipid
Nanoparticle Delivery*

Shrey Sindhwani
(<http://inbs.med.utoronto.ca>),
University of Toronto, Canada
*How Do Nanoparticles Enter Solid
Tumours?*

Muthiah Manoharan, Alnylam
Pharmaceuticals, Inc., USA
*Translation Aspects: The First Approved
RNAi Therapeutic: Delivery of
ONPATPRO (patisiran)*

4:30—5:00 PM

Coffee Available

Hall 6

5:00—7:00 PM

**Nanoparticles and Polymers for the Efficient
Crossing of Biological Barriers**

Concert Hall

Dan Peer, University of Tel Aviv, Israel
*A Universal Platform for RNA
Therapeutics*

Giulia Brachi, Politecnico di Torino,
Italy
*Short Talk: Nanoparticles Transport in
Glioblastoma from Intracranially-
Administered Thermosensitive
Hydrogels*

Simple Kumar, Georgia Institute of
Technology, USA
*Short Talk: Serum Effects on
Nanoparticle-Mediated Photoporation
for Enhanced Macromolecular Delivery*

Renata Pasqualini, Rutgers University,
USA
*Ligand-Directed Targeting and
Molecular Imaging Based on Vascular
Zip Codes Revealed by in vivo Phage
Display*

Maria J. Vicent
(<http://www.VicentResearchLab.com>),
Centro de Investigación Príncipe Felipe,
Spain
*Polypeptide-Based Conjugates as
Versatile Drug Delivery Carriers*

7:00 PM

On Own for Dinner

WEDNESDAY, MAY 8

8:30—11:45 AM

Materials and Devices for Diagnostics and Therapeutic Delivery**Concert Hall**

* **Clive Prestidge**, University of South Australia, Australia

Tanja Weil, Max Planck Institute for Polymer Research, Germany
Quantum Materials, Customized and Adaptive Macromolecules for Precision Sensing and Therapy

Paula T. Hammond
(<http://hammondlab.mit.edu/>),
Massachusetts Institute of Technology, USA
Electrostatic Assembly for Nanoparticle Targeting of Cells and Tissues

Crystal Shin, Baylor College of Medicine, USA
Short Talk: Cerium Oxide Nanowafer to Treat Corneal Neovascularization

Coffee Break

Joke A. Bouwstra, Leiden University, Netherlands
Drug Device Combinations for Vaccine Delivery

Vipul Yadav
(<http://www.intractpharma.com/>),
Intract Pharma Limited, UK
Short Talk: Soteria®: Delivery of Antibodies in an Easy to Swallow Oral Pill

Julie A. Champion, Georgia Institute of Technology, USA
Developing Therapeutic Protein Materials: Controlling and Understanding Protein Particle Self-Assembly

Cathal J. Kearney
(<https://www.rcsi.com/people/profile/cathalkearney>),
Royal College of Surgeons in Ireland, Ireland
Short Talk: On-Demand Delivery Scaffolds for Tissue Engineering

11:45 AM—5:00 PM

On Own for Lunch

11:45 AM—1:00 PM

Poster Setup

1:00—10:00 PM

Poster Viewing**Hall 6**

4:30—5:00 PM

Coffee Available**Hall 6**

5:00—7:00 PM

Overcoming the Blood-Brain Barrier to Treat CNS Disease**Hall 6****Concert Hall**

* **Kinam Park**, Purdue University, USA

Carl I. Webster, MedImmune, UK
Brain Delivery and Intracellular Sorting

of Affinity Variants of the Anti-TfR
Antibody OX26

Marco Campisi, Politecnico di Torino,
Italy
*Short Talk: Model of Nanoparticles
Transport Across the Human Blood-
Brain Barrier Microvasculature*

Danica Stanimirovic, National
Research Council of Canada, Canada
*Novel Targets and Antibodies for
Delivery of Therapeutics across the
Blood-Brain Barrier*

Florencia Natalia Linero
(<http://www.vib.be/en/research/scientists/Pages/Roos-Vandenbroucke-Lab.aspx>), VIB-
University of Gent, Belgium
*Short Talk: Breaking Down Barriers:
Nanobodies to Deliver Therapeutics
Across the Blood-Cerebrospinal Fluid
Barrier*

Matthew Campbell, Trinity College
Dublin, Ireland
*Dose-Dependent Expression of
Claudin-5 at the BBB*

7:00—8:00 PM

Social Hour with Lite Bites

No registration fees are used to fund alcohol served at this function.

7:30—10:00 PM

Poster Session 2

Hall 6

Hall 6

THURSDAY, MAY 9

8:30—11:30 AM

Delivery Solutions for Gene Medicines

Concert Hall

* **Sally-Ann Cryan**, Royal College of
Surgeons in Ireland, Ireland

David V. Schaffer, University of
California, Berkeley, USA
*Directed Evolution of New Viruses for
Therapeutic Gene Delivery*

Ross Wilson
(<http://www.rosswilsonlab.org>),
University of California, Berkeley, USA
*Short Talk: Delivery of an Endosomolytic
CRISPR-Cas9 RNP via Receptor-
Mediated Endocytosis for Cell-Targeted
Genome Editing*

Khalid A. Hajj, Carnegie Mellon
University, USA
*Enabling the Medicines of Tomorrow:
Lipid Nanoparticles for Enhanced Co-
Delivery of RNAs*

Coffee Break

Elias Fattal (<http://www.fattal.fr>),
Université Paris-Sud, France
CD44-Targeted Delivery of siRNA

Anna K. Blakney
(<https://annablakney.com/>),
Imperial College London, UK

Short Talk: The Skin You're In: Design of Experiments Optimization of LNP saRNA Formulations in Human Skin Explants

Caitriona O'Driscoll, University College Cork, Ireland
Short Talk: Formulation and Characterisation of Nanoparticles Prepared by Co-Formulation of Cationic and Anionic Amphiphilic Cyclodextrins as Promising siRNA Delivery Systems

11:30 AM—5:00 PM

On Own for Lunch

11:30 AM—12:00 PM

NIH Grant Process: From Submission to Review: A Roundtable for Trainees and Young Faculty**Concert Hall**

* **Bita Nakhai**, NIA, National Institutes of Health, USA

2:30—4:30 PM

Workshop 2: Academic Drug Delivery Writing and Publishing in Top Journals**Concert Hall**

* **Alison L. Reynolds**, University College Dublin, Ireland

Stephen Timothy Buckley, Novo Nordisk A/S, Denmark
Academic Writing on Drug Delivery for Top Journals: A Case Study

Gonzalo Cordova, Springer Nature B.V., Netherlands
What Editors Are Looking for in Delivery Papers

4:30—5:00 PM

Coffee Available**Hall 6**

5:00—6:45 PM

Human Cell and Tissue Models of Biological Barriers to Assist Translation**Concert Hall**

* **David Brayden**, University College Dublin, Ireland

Claus-Michael Lehr, Helmholtz-Institute for Pharmaceutical Research Saarland, Germany
Modeling Biological Barriers to Drug Delivery in Infection Research

Ludivine Claude Delon
 (<http://bionanoengineering.com/members/postgraduate-students/>), University of South Australia, Australia
Short Talk: Systematic Investigation of the Effect of Shear Stress in a Microfluidic Intestine-on-a-Chip Model to Study Oral Particle Delivery

Helena Kandarova
 (<http://www.helenakandarova.com>), Slovak Toxicology Society SETOX, Slovakia
Reconstructed Human Skin Equivalents to Model the Transport and Toxicology of the Skin Barrier

Josué Sznitman, Technion - Israel
Institute of Technology, Israel
*Advanced in vitro Lung-on-Chip
Platforms for Inhalation Screening
Assays*

6:45—7:15 PM

Summary and Analysis**Concert Hall**

* **David Brayden**, University College
Dublin, Ireland

* **Claus-Michael Lehr**, Helmholtz-
Institute for Pharmaceutical Research
Saarland, Germany

Kinam Park, Purdue University, USA
*An Assessment of the Current and
Likely Impact of the Science of
Crossing Biological Barriers on
Medicine*

7:15—8:15 PM

Social Hour with Lite Bites

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8:15—11:00 PM

Entertainment

Entertainment is not subsidized by conference registration fees nor any U.S. federal
government grants. Funding for this expense is provided by other revenue sources.

Hall 6**Hall 6****FRIDAY, MAY 10**

Departure

*Session Chair †Invited, not yet responded.

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