



CRS Annual Meeting & Exposition
July 22-24, 2018 | New York City, NY, U.S.A.



COLLABORATE • CONNECT • INNOVATE

2018 PROGRAM

2018.controlledreleasesociety.org

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Dear Attendees,

Welcome to New York City! We are thrilled to have you at the 45th Controlled Release Society Annual Meeting and Exposition (#CRSNYC).

Over the next 3 days, you will have access to world-renowned speakers, cutting-edge research, 100+ educational offerings, and endless networking opportunities with the best and brightest in delivery science.

I am also thrilled to announce the significant re-invigoration that will be launching right here at the annual meeting, CRS Focus Groups. The focus groups are centered around the areas of **Ocular Drug Delivery (OcDD)**, **Oral Drug Delivery (OrDD)**, **Nanomedicine and Nanoscale Drug Delivery (NNDD)**, **Gene Delivery and Gene Editing (GDE)**, **Bioinspired and Biomimetic Drug Delivery (BBDD)**, and will provide leadership opportunities for young scientists. The initiator and frontrunner of this re-invigoration is Steven R. Little (University of Pittsburgh, U.S.A.).

I am extremely grateful for the tremendous work of the members of the Program Committee in preparing an outstanding 2018 CRS Annual Meeting. Committee includes: Chair – Hamid Ghandehari (University of Utah, U.S.A.); Co-Chairs - Twan Lammers (RWTH Aachen University, Germany), Yu-Kyoung Oh (Seoul National University, South Korea); Members - Thierry Vandamme (Université de Strasbourg, France), Tapashi Sengupta (Monsanto Company, U.S.A.), Kaushalkumar Dave (United States Food and Drug Administration, U.S.A.).

The Controlled Release Society is, in my opinion, one of the most respected and unique societies that covers new technologies and science in the multi-disciplinary delivery fields. CRS has succeeded in fostering significant progress

in the areas of bioengineering, drug delivery, material science, pharmaceuticals, consumer and diversified products, and veterinary science. With members in more than 30 countries, as well as 15 local chapters throughout the world, our excellent annual meetings, and two prestigious CRS journals, the *Journal of Controlled Release* (impact factor in 2018 of 7.877, Editor-in-Chief Kinam Park) and the recently established journal *Drug Delivery and Translational Research* (impact factor in 2017 of 3.094, Editor-in-Chief Vinod Labhasetwar), we can look to the Society's future with deserved optimism.

If you're not already a member, now is the ideal time to become a part of the Controlled Release Society. Through our collective efforts, we can raise CRS and the existing science and technology we are involved in to a new level.

I look forward to connecting with you here in New York City.

Sincerely,

Tamara Minko, Ph.D.

President of the CRS



GENERAL MEETING INFORMATION



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CRS BOARD OF DIRECTORS

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CRS Headquarters Staff is Ready to Serve You!

CRS headquarters staff values current members and meeting participants and future members and meeting attendees. Our goal is to consistently provide you outstanding service, products, and programs. Use the following quick reference list to reach the appropriate persons in areas in which you may need assistance. Please call the general number for assistance Monday through Friday during the office hours of 08:30 AM – 4:30 PM Eastern Time. Remember, you can leave a voice mail or e-mail message at any time. We look forward to hearing from you!

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GENERAL MEETING INFORMATION

All events will take place at the New York Hilton Midtown in New York City, July 22 – 24, 2018

Registration Hours

The registration desk will be open during the following hours: (Hours are subject to change)

Saturday, July 21st – 7:00 AM – 5:00 PM

Sunday, July 22nd – 7:00 AM – 5:00 PM

Monday, July 23rd – 7:00 AM – 5:00 PM

Tuesday, July 24th – 7:00 AM – 4:00 PM

Use of CRS Scientific Program Content

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Speaker Ready Room Hours:

Saturday, July 21st – 7:00 AM – 5:00 PM

Sunday, July 22nd – 7:00 AM – 5:00 PM

Monday, July 23rd – 7:00 AM – 5:00 PM

Tuesday, July 24th – 7:00 AM – 4:00 PM

The Speaker Ready Room is located in Holland Room. The Speaker Ready Room is provided for presenters to prepare for their presentations and to ensure a seamless integration of a wide variety of audiovisual technologies in the various meeting rooms. By checking in at the Speaker Ready Room and following these simple guidelines, speakers will greatly contribute to the success of the meeting. CRS requests all presenters to use **PowerPoint™ Presentations**. All meeting rooms will have presentation computers and will be networked from a central computer located in the Speaker Ready Room. Presentations will be downloaded from the Speaker Ready Room and sent to the respective meeting room on a secured intranet circuit approximately 45 minutes prior to the start of each session. Presenters are encouraged to review their presentations or make any last minute changes. **All speakers must check into the Speaker Ready Room.**

Access the Abstracts

CRS annual meeting abstracts can easily be accessed on the CRS Meeting App. Within the app, click on the Posters icon to begin viewing poster abstracts, and view podium abstracts directly from the schedule. The abstracts will be available on the CRS website after the meeting.

Electronic Devices

As a courtesy to other meeting attendees, please turn off or silence all electronic devices during all workshops, sessions, and presentations.

Photography

Photography is not permitted in the session rooms, exhibit hall, or poster sessions.

Photo Release

By virtue of your attendance, you agree to the Controlled Release Society's use of your likeness in promotional media.

Children and the CRS Annual Meeting & Exposition

The CRS Annual Meeting & Exposition is a professional, scientific meeting. CRS does not permit anyone under the age of 18 to attend the scientific sessions, poster sessions, exposition, and social events. For safety reasons, only registered exhibitors and poster presenters are permitted in the exposition/poster hall during set-up and take-down hours. Anyone 18+ must register and buy applicable individual tickets if not attending/registering as a student.

CRS Antitrust Policy

It is the undeviating policy of the Controlled Release Society (CRS) to comply strictly with the letter and spirit of all United States federal laws, as well as state, and applicable international trade regulations and antitrust laws. Any activities of CRS or related actions of its staff, officers, trustees, or members that violate these laws and regulations are detrimental to the interests of CRS and are unequivocally contrary to CRS' policy.

The implementation of the antitrust compliance policy of CRS shall include, but not be limited to the following:

- a. All the association activities or discussions shall be avoided that might be construed as tending to: (1) raise, lower, or stabilize prices; (2) allocate markets; (3) encourage boycotts, (4) foster unfair trade practices; or (5) in any way violate US federal, state, or applicable international trade regulations and antitrust laws.
- b. No officer, director, or member of CRS shall make any representation in public or in private, orally or in writing, that states, or appears to state, an official policy or position of CRS without specific authorization to do so
- c. CRS members, officers, or directors who participate in conduct that the Board of Directors, by a two-thirds majority vote, determine to be contrary to the CRS Antitrust Policy shall be subject to disciplinary measures up to, and including, termination.

GENERAL MEETING INFORMATION



Exhibits

The exhibits are an integral part of the complete education experience and will feature the latest in research products in the field of osteoarthritis. Please make time during the meeting to visit the exhibits during their open hours. They are located in **Rhineland Gallery**.

Monday 9:00 AM – 4:30 PM
5:00 PM – 6:00 PM

Tuesday 9:00 AM – 4:00 PM

Our Sunday evening opening reception will be held in the exhibit hall as well as all breaks beginning on Monday.

Poster Sessions

Posters are located in Rhineland Gallery, Gramercy, and Murray Hill Rooms, on the second floor of the hotel. All posters must be removed during Poster Take-Down or they will be discarded. The poster viewing area will be secured overnight. Photographing posters is not permitted.

The Posters Sessions are an important educational event of this meeting. We hope you support and attend these scientific presentations. Poster board numbers correspond with the poster numbers in CRS Mobile App.

Posters will be displayed during the entire meeting. Listed below is the schedule when authors are to be present with their poster.

Monday, July 23, 2018 – Authors will be with the posters
Odd Posters 12:30 PM – 1:30 PM

Tuesday, July 24, 2018 – Authors will be with the posters
Even Posters 12:30 PM – 1:30 PM

Monday, July 23, 2018

POSTER PUB – 5:00 PM – 6:00 PM

All posters presented – All Authors will be with the posters

**ALL POSTERS MUST BE TAKEN DOWN BY 5:00 PM
ON TUESDAY, JULY 24TH OR THEY WILL BE REMOVED
AND DISCARDED.**

the next pediatric formulation challenge...

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Multiparticulate formulation strategies are increasingly utilized in pediatric medicines due to their flexibility in dosing, administration and dispensing, as well as their proven stability and suitability for modified release.

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2018 CRS AWARDS & RECOGNITION

Congratulations to the 2018 Award Winners

CRS is honored to continue the tradition of recognizing the excellence of our members. Please be sure to attend the award ceremony on Sunday, July 22, 2018, in the Grand Ballroom at 12:30 PM and personally congratulate the awardees on their well-earned commendation. Find full biographies of awardees on the CRS website.

Distinguished Service Award

The Distinguished Service Award is presented to a CRS member who has exhibited exceptional commitment and service to the society and is selected by the Board of Directors.



Ruth Schmid, PhD
SINTEF Industry

College of Fellows

The College of Fellows recognizes those members who have made outstanding contributions to the field of delivery science and technology over a minimum of 10 years. Contributions may have been technical, scientific, and/or managerial in one or more fields of research, commercial development, education, and/or leadership within the areas of interest to CRS. Fellowship is the most prestigious level of membership in CRS.



Maria José Alonso, PhD
University of Santiago de Compostela



Ben J. Boyd, PhD
Monash Institute of Pharmaceutical Sciences



Alexander Kabanov, PhD, DSC
University of North Carolina, Chapel Hill



Mark Prausnitz, PhD
Georgia Institute of Technology



Mark A. Tracy, PhD
Tracy BioConsulting, LLC

Founders Award

The society grants this honor to a current CRS member who is internationally recognized for outstanding contributions in the science and technology of controlled release.



Maria José Alonso, PhD
University of Santiago de Compostela

CRS T. Nagai Postdoctoral Research Achievement Award

This award recognizes an individual postdoc who has recently completed postdoctoral research in controlled release science and technology and the postdoc's advisor, who played an integral role in the achievements.



Raghu Ganugula – Post-Doc
Texas A&M University



Ravikumar Majeti, PhD – Sponsor
Texas A&M University

Young Investigator Award

This award recognizes a CRS member who has made outstanding contributions in the science of controlled release and is 40 years of age or younger in the year the award is presented.



Steven R. Little, PhD
University of Pittsburgh

Transdermal Delivery Kydonieus Foundation



Richard H. Guy, PhD
University of Bath

Drug Delivery and Translational Research Outstanding Paper Award Co-Sponsored by Springer



Nina Derby

Co-Authors: Nina R Derby, Meropi Aravantinou, Jessica Kenney, Shweta R. Ugaonkar, Asa Wesenberg, Jolanta Wilk, Larisa Kizima, Aixa Dones Rodríguez, Shimin Zhang, Olga A Mizenina, Keith Levendosky, Michael L. Cooney, Samantha Seidor, Agegnehu Gettie, Brooke Grasperge, James D. Blanchard, Michael J. Piatak, Jeffrey D Lifson, José A Fernández-Romero, Thomas M. Zydowsky, Melissa Robbiani

An intravaginal ring that releases three antiviral agents and a contraceptive blocks SHIV-RT infection, reduces HSV-2 shedding, and suppresses hormonal cycling in rhesus macaques

2018 CRS AWARDS & RECOGNITION



**Jorge Heller Journal of Controlled Release
Outstanding Paper Award**
Co-Sponsored by Elsevier

*Multifunctional liposomes delay phenotype progression
and prevent memory impairment in a presymptomatic
stage mouse model of Alzheimer disease*



Massimo Masserini

Co-Authors: Simona Mancini, Cladia Balducci,
Edoardo Micotti, Daniele Tolomeo, Gianluigi Forloni,
Francesca Re

CRS BOARD *and* COMMITTEE MEETINGS

FRIDAY, JULY 20 th	TIME	ROOM
CRS Strategic Planning Session	9:00 AM – 3:00 PM	Hilton Board Room
SATURDAY, JULY 21 st	TIME	ROOM
CRS Board of Directors Meeting	8:00 AM – 6:00 PM	Hilton Board Room
SUNDAY, JULY 22 nd	TIME	ROOM
Leadership Forum	9:00 AM – 11:00 AM	Nassau East
2019 AMPC Planning Meeting	10:30 AM – 12:30 PM	Hilton Board Room
Local Chapters Meet & Greet	11:00 AM – 12:30 PM	Nassau West
MONDAY, JULY 23 rd	TIME	ROOM
Elsevier Editorial Board Meeting – JCR	12:00 PM – 1:30 PM	Bryant Room
TUESDAY, JULY 24 th	TIME	ROOM
C&DP Division Meeting	7:00 AM – 8:00 AM	Morgan Room
Springer Editorial Board Meeting – DDTR	7:00 AM – 8:30 AM	Bryant Room
Industry Advisory Meeting	12:00 PM – 1:30 PM	Clinton Room
Elsevier Editorial Board Meeting – ADDR	12:00 PM – 1:30 PM	Bryant Room
CRS Board Meeting	4:30 PM – 6:00 PM	New York

Saturday, July 21 | Program

PRE-MEETING WORKSHOPS

Oral Peptide Delivery: A Follow-Up From CRS 2014 (Part 1)

8:30 AM – 5:00 PM | Sutton South

Sponsored by:  AstraZeneca  Boehringer Ingelheim  Catalent
 GATTEFOSSÉ  Lonza Pharma & Biotech  Lilly  Novo Nordisk  MERCK INVENTING FOR LIFE

Basic Concepts of Oral Drug Delivery: What You Need to Know

9:00 AM – 5:00 PM | Sutton Center

Sponsored by:  Dow  Colocon  GATTEFOSSÉ  BASF We create chemistry
 Ashland always solving

Nanomedicine From Bench To Bedside – Facilitating Research Translation To Clinics Young Scientist Workshop

1:00 PM – 5:00 PM | Beekman Room

This CRS-YSC organized Scientific Workshop aims to provide researchers an opportunity to gain knowledge and understanding of clinical translation of nanomedicines. The workshop will bring together experts and scientists in nanomedicine to discuss a range of topics including:

- Lab scale development to industrial scale up, manufacturing and translation
- Standardization and characterization from basic research to clinical development
- Preclinical, clinical, and safety considerations in the development process
- Regulatory challenges for development and commercialization

**All workshops require a paid ticket to attend. Tickets can be purchased at the registration desk.*

Sunday, July 22 | Morning Program

PRE-MEETING WORKSHOPS

Oral Peptide Delivery: A Follow-Up From CRS 2014 (Part 2)

8:00 AM – 12:30 PM | Sutton South

Sponsored by:  AstraZeneca  Boehringer Ingelheim  Catalent
 GATTEFOSSÉ  Lonza Pharma & Biotech  Lilly  Novo Nordisk  MERCK INVENTING FOR LIFE

Young Scientist Professional Development Workshop: Enhancing your Networking and Communication Skills

8:00 AM – 11:30 AM | Regent Room

Have you ever felt you could get more out of your career? Are you close to graduating, about to start a new job, or just thinking about making a change? If so, this workshop is for you! This interactive session will discuss key factors for professional success, including effective communication skills, successful networking strategies, establishing professional collaborations, and improving your leadership skills. In this workshop, you will receive tips on how to boost your career in these areas, and be given the opportunity to practice some strategies that will help you pave the way for a bright future, full of achievements.

TECHNOLOGY FORUMS*

8:30 AM – 12:15 PM

**Please see page 9 for Technology Forum details*

LOCAL CHAPTERS MEET & GREET

11:00 AM – 12:30 PM | Nassau West

YOUNG SCIENTIST MEET & GREET WITH A LUMINARY Rakesh Jain

11:30 AM – 12:30 PM | Beekman Room

OPENING SESSION & AWARDS CEREMONY

12:30 PM – 1:30 PM | Grand Ballroom

President: Tamara Minko, Rutgers University, U.S.A.

PLENARY SESSION 1

Moderated by: Yoon Yeo, Purdue University, U.S.A.

A Long Walk to PLGA

1:30 PM – 2:30 PM | Grand Ballroom

Kinam Park

Purdue University, U.S.A.



Followed by An Interactive Session with Kinam Park

2:30 PM – 3:00 PM | Grand Ballroom

At the end of the lecture, attendees can meet and greet with Kinam Park to ask questions related to the scope of the talk, the science discussed, career advice, etc. This will be done in an informal and interactive setting.

REFRESHMENT BREAK

2:30 PM – 3:00 PM | 2nd Floor Promenade

CONCURRENT SESSIONS

3:00 PM – 5:00 PM

See pages 10 & 11 for details.

Sunday, July 22 | Technology Forums

Open to all registered attendees on a complimentary basis, these forums offer in-depth coverage of technologies and services hosted by the presenting companies. Detailed descriptions of the individual forums can be found on the CRS Meeting App.

8:30 AM to 9:30 AM



Single Particle Zeta Potential Characterization of Biological Nanoparticles using Tunable Resistive Pulse Sensing (TRPS)

Madison Room



Meeting the Formulation Challenges of Bitter Tasting Drugs

Morgan Room



Designing Patient Friendly Dosage Forms to Target the Unique Therapeutic Needs of the ever-increasing Geriatric – “Silver Tsunami” - Patient Population

Clinton Room

9:45 AM to 10:45 AM



EUDRAGIT® Solid Dispersions as Carriers for Solubility Enhancement of Poorly Water Soluble Drugs

Bryant Room



High-Throughput or Well-Characterized? Light Scattering Tools for Rapid Screening and Deep Characterization of Therapeutic Nanoparticles

Morgan Room



Characterizing Controlled Release Vehicles

Madison Room



Innovations in Drug Delivery

Clinton Room

11:15 AM to 12:15 PM



EUDRATEC® PEP - An Innovative Smart Oral Delivery Technology for Proteins and Peptides

Bryant Room



Trends in Small Volume Dissolution 2018

Morgan Room



Strategies for the Formation and Coating of Multiparticulates for use in modified release products using the Conical Rotor Processor

Madison Room



Use of canine PK/ PD models in the development of differentiated drug products.

Clinton Room

Sunday, July 22 | 3:00 PM – 5:00 PM

BEEKMAN ROOM

SCIENTIFIC SESSION:

Delivery Technologies in Cosmetics, Personal Care, and Household Products

Moderated by: Alireza Abbaspourrad & Parizad Adil Elchidana

Session Chair: Tapashi Sengupta

3:00 PM

- I-1** *Engineering Of Bioadhesive Nanoparticles To Produce Broad-spectrum, Non-penetrating Sunscreens*
Mark Saltzman, Yale University, U.S.A.

3:30 PM

- I-2** *Skin Penetration and Release - Overcoming Obstacles and Methods to confirm Targeted Delivery*
Peter Landa, Estee Lauder, U.S.A.

4:00 PM

- 1** *Ocular Diabetic Theranosis Using Smart Contact Lens*
S. Hahn, D. Keum; POSTECH, Pohang, Republic of Korea

4:10 PM

- 2** *Randomised, Split-Face Study Of The Efficacy Of Microneedle Patches With Accelerated Absorption Of Hyaluronic Acid For Reduction Of Static Lateral Canthus Rhytides*
N. De Mello¹, R. Bamsey²; ¹Swansea Univ., Swansea, United Kingdom, ²Innoture Limited, Swansea, United Kingdom

4:20 PM

- 3** *Localised Skin Delivery Of Cosmetic Actives And The Effect Of Formulation, Using Mass Spectrometry Imaging For Both In Vivo And Ex Vivo Sample Analysis*
N. Starr¹, J. Hicks², C. Elms², M. Bell², L. Pérez-García¹, D. Scurr¹; ¹Univ. of Nottingham, Nottingham, United Kingdom, ²Walgreens Boots Alliance, Nottingham, United Kingdom

4:30 PM

- 4** *Comparison of Skin Delivery of methyl Amino Levulinic Acid following Pretreatment with Three Physical Penetration Enhancement Technologies*
H. Benson¹, Y. Jhanker¹, M. Mbano¹, T. Prow²; ¹Curtin Univ., Perth, Australia, ²Univ. of South Australia, Adelaide, Australia

4:40 PM

Panel Discussion

SUTTON NORTH

SCIENTIFIC SESSION:

Micro- and Nanoparticle Delivery

Moderated by: Fakhrol Ahsan

Session Chair: You Han Bae

3:00 PM

- pH Transistor Nanoparticles for Cancer Imaging and Surgery*
Jinming Gao, UT Southwestern Texas, USA

3:30 PM

- I-3** *Using Lipid Nanocapsules To Translate Promising Molecules Into Therapies For Central Nervous System Diseases*
Anne des Rieux, Univ Catholique de Louvain, Belgium

4:00 PM

- 5** *Specific Targeting Of The Inflamed Myocardium By Mesenchymal Stem Cells-derived Nano-ghosts*
N. Letko Khait, M. Machluf; Technion - Israel Inst. of Technology, Haifa, Israel

4:10 PM

- 6** *Targeted Combination Therapy To Treat Breast Cancer*
S. Lee, B. Law, M. Han, C-H. Tung; Weill Cornell Med., New York, NY, U.S.A.

4:20 PM

- 7** *The Development And Evaluation Of Novel Radiolabeled Niosomes As A Potential Passive Targeting Nanocarriers In Breast Cancer Murine Xenografts.*
L. De Silva¹, L-H. Chuah¹, T-T. Htar¹, J-Y. Fu², A. Kasbollah³, S. Muniyandy⁴; ¹Monash Univ. Malaysia, Subang Jaya, Malaysia, ²Malaysian Palm Oil Board, Bandar Baru Bangi, Malaysia, ³Malaysian Nuclear Agency, Kajang, Malaysia, ⁴Fatima Coll. of Hlth.Sci., Ajman, United Arab Emirates

4:30 PM

- 8** *Effect Of Temperature Elevation On Short Duration Focused Ultrasound Hyperthermia Mediated Drug Delivery Using Thermosensitive Liposomes And In Vivo Two-photon Microscopy*
M. A. Santos, D. E. Goertz, K. Hynynen; Univ. of Toronto, Toronto, ON, Canada

4:40 PM

Panel Discussion

SUTTON CENTER

FOCUS GROUP SCIENTIFIC SESSION:

Bioinspired and Biomimetic Drug Delivery (BBDD) Focus Group Scientific Session

Session Chair: Zhen Gu

Session Co-Chair: Zhuang Liu

3:00 PM

- Bioinspired and Biomimetic Strategies for Drug Delivery*
Samir Mitragori, Harvard University, U.S.A.

3:30 PM

- 218** *Synthetic Cells Produce Protein Medicines Inside Tumors*
A. Schroeder; Technion - Israel Inst. of Technology, Haifa, Israel
BBDD Focus Group Young Investigator Award Winner

3:55 PM

- 265** *Bacteria-inspired Surface Modification With Polygamaglutamic Acid For Biocompatibility Of Nanomaterials*
G. Shim, D. Kim, J. Kim, M. Suh, Y-K. Oh; Seoul Natl. Univ., Seoul, Republic of Korea

4:15 PM

- 14** *Extracellular Vesicle-based Hydrogels As Efficient Machinery For Anti-inflammatory Therapeutics Synthesis*
G. Fuhrmann¹, R. Chandrawati², P. A. Pamar³, T. J. Keane³, S. Bertazzo⁴, M. M. Stevens³; ¹Helmholtz-Inst. for Pharmaceutical Res., Saarbrücken, Germany, ²The Univ. of Sydney, Sydney, Australia, ³Imperial Coll., London, United Kingdom, ⁴Univ. Coll., London, United Kingdom

4:30 PM

- 177** *Polymeric Nanoparticles Encapsulating TLR7/8 Agonist For NK Cell-mediated Cancer Immunotherapy*
H. Kim, T. A. Kucaba, P. Larson, V. Khanna, D. M. Ferguson, T. S. Griffith, J. Panyam; Univ. of Minnesota, Minneapolis, MN, U.S.A.

4:45 PM

- 613** *Nature-inspired Peptide-based Virus Mimics For Plasmid DNA Delivery*
R. Ni, Y. CHAU; Hong Kong Univ. of Sci. and Technology, Kowloon, Hong Kong

Sunday, July 22 | 3:00 PM – 5:00 PM (continued)

<p>SUTTON SOUTH</p> <p>FOCUS GROUP SCIENTIFIC SESSION: Gene Delivery and Gene Editing Focus Groups Scientific Sessions</p> <p>Session Chair: Dan Siegwart Session Co-Chair: Gaurav Sahay</p>	<p>REGENT ROOM</p> <p>MINI-SYMPOSIUM: 3D Printing in Drug Delivery</p> <p>Session Co-chairs: Abu Serajuddin & Akm Khairuzzaman</p>	<p>GRAND BALLROOM</p> <p>INDUSTRY ROUND TABLE: Delivering Meaningful Value to Rare Disease Patients through Innovation & Partnership</p> <p>Moderated by: Patrick Lim Soo</p>
<p>3:00 PM <i>Nanoformulations for delivery of RNA and genome editing complexes</i> Daniel Anderson, MIT, Boston, U.S.A.</p> <p>3:30 PM <i>Cancer-specific And Biologically-informed Biomaterials for gene- and drug-delivery</i> Natalie Artzi, Harvard Medical School, Boston, U.S.A. GDE Focus Group Young Investigator Award Winner</p> <p>3:50 PM 10 <i>Nonviral Genome Editing Via CRISPR/cas9 Delivery By Membrane-disruptive And Endosomolytic Helical Polypeptide</i> H-X. Wang¹, Z. Song², Y-H. Lao¹, J. Gong¹, M. Li¹, L. Yin², J. Cheng², K. W. Leong¹; ¹Columbia Univ., New York, NY, ²Univ. of Illinois at Urbana-Champaign, Champaign, IL, ³Soochow Univ., Suzhou, China</p> <p>4:10 PM 594 <i>Pre-Treatment Of Brain Tissue With Pulsed Focused Ultrasound Enhances Brain-penetrating Nanoparticle-Mediated Transfection Via Mechanosensitive TRPA1 Channel Activation</i> B. Mead¹, C. Curley¹, N. Kim², J. Song¹, G. Miller¹, W. Garrison¹, J. W. Mandell¹, A. Klibanov¹, J. Suk², J. Hanes², R. J. Price¹; ¹Univ. of Virginia, Charlottesville, VA, ²Johns Hopkins Univ., Baltimore, MD, U.S.A.</p> <p>4:20 PM 598 <i>In Vivo Bone Marrow Nucleic Acid Delivery Systems for Therapeutic Targeting of Multiple Myeloma-Microenvironment Interactions</i> M. J. Mitchell; Univ. of Pennsylvania, Philadelphia, PA, U.S.A.</p> <p>4:30 PM 600 <i>Lipid Nanoparticle Ionization At Endosomal pH Is A Cell-free Predictor Of mRNA Delivery Efficacy In Vivo</i> K. A. Hajj, K. A. Whitehead; Carnegie Mellon Univ., Pittsburgh, PA, U.S.A.</p> <p>4:40 PM 645 <i>Development Of Polymeric Micelles For mRNA Delivery Through Complexation With Flexible Block Ionomers</i> T. Miyazaki, S. Uchida, H. Cabral; The Univ. of Tokyo, Tokyo, Japan</p> <p>4:50 PM 595 <i>Immunogene Therapy of Infections Using Fusogenic Porous Silicon Nanoparticles</i> B. Kim; Univ. of California, San Diego, La Jolla, CA, U.S.A.</p>	<p>3:00 PM <i>Formulation of 3D-printed tablets</i> Abu Serajuddin St. John's University, U.S.A.</p> <p>3:30 PM <i>3D-printed drug products</i> Akm Khairuzzaman Food & Drug Administration Center for Drug Evaluation & Research, U.S.A.</p> <p>4:00 PM <i>Challenges and directions of 3D-printed drug delivery</i> Lifeng Kang University of Sydney, Australia</p> <p>4:30 PM <i>Challenges and Directions of 3D-Printed Drug Delivery</i> Dennis Douroumis, University of Greenwich, Finland</p>	<p>Sponsored by:</p>  <p>Paul McCormac Executive Director, Medicinal Sciences at Pfizer</p> <p>Manuel Sanchez-Felix Senior Fellow, Novel Delivery Technologies at Novartis</p> <p>David H. Thompson Purdue University</p> <p>Christian Girard Orphan Drugs Industry Advisory & Intelligence</p>

OPENING RECEPTION WITH EXHIBITORS

5:00 PM – 7:00 PM | Rhinelander Gallery

PSAH NETWORKING EVENT*

7:30 PM – 9:30 PM | Off-site Event (The Three Monkeys Bar)

YOUNG SCIENTIST NETWORKING EVENT*

6:30 PM – 9:30 PM | Off-site Event (Tir-na-Nog)

**Ticket purchase required. Tickets can be purchased at registration while supplies last.*

Monday, July 23 Morning Program

FOCUS GROUP MEMBERSHIP MEETINGS

7:00 AM – 8:00 AM

CRS is proud to announce the formation of five, new Focus Groups that are built on the concept of providing you opportunities that were not previously available to you including networking with field leaders, getting exposure for your research program, and becoming (and remaining) a vital part of your research community. All members of CRS who are interested in learning more about a specific focus group are invited to attend these membership meetings.

Ocular Drug Delivery (OcDD)

Bryant Room

Biomimetic and Bio Inspired Drug Delivery (BBDD)

Morgan Room

Oral Drug Delivery (OrDD)

Madison Room

Gene Delivery and Gene Editing (GDE)

Clinton Room

Nanomedicine and Nanoscale Drug Delivery (NNDD)

Nassau East

YOUNG SCIENTISTS START WITH A LUMINARY*

7:00 AM – 8:00 AM | Nassau West

Throwback the sheets, gulp down some coffee and head to this early morning event that will provide young scientists an opportunity to get to know and network with luminaries in the CRS community. This session aims to inspire the next generation of young scientists by giving direct access to established scientists that are internationally recognized for outstanding contributions in the science and technology of controlled release and have promoted the advancement of the field. Questions about their story, how they got to where they are today, what they would do differently and what advice would they give to early career scientists today can all be answered in this informal and relaxed setting. Bring plenty of business cards and plan on starting connections that could last a lifetime.

Luminaries: Steven Schwendeman, Justin Hanes, Mark Saltzman & Molly Stevens

EXHIBIT HALL OPEN

9:30 AM – 4:30 PM

PLENARY SESSION 2

Moderated by: Twan Lammers, RWTH Aachen University, Germany

Re-engineering the Tumor Microenvironment to Improve Cancer Treatment

8:00 AM – 9:00 AM | Grand Ballroom

Rakesh Jain
Harvard Medical School and Massachusetts General Hospital, U.S.A.



Pancreatic Cancer: A Survivor's Journey

9:00 AM – 9:30 AM | Grand Ballroom

Lora Kelly
Central PA Chapter of the National Pancreas Foundation (NPF), U.S.A.



Followed by An Interactive Session with Rakesh Jain & Lora Kelly

9:30 AM – 10:00 AM | Grand Ballroom

At the end of the lecture, attendees can meet and greet with Rakesh Jain & Lora Kelly to ask questions related to the scope of the talk, the science discussed, career advice, etc. This will be done in an informal and interactive setting.

EXHIBIT HALL OPEN

9:00 AM – 4:30 PM

REFRESHMENT BREAK

9:30 AM – 10:00 AM | Rhinelander Gallery

CONCURRENT SESSIONS

10:00 AM – 12:00 PM

See pages 14 & 15 for details.

LUNCH IN EXHIBITION HALL

12:00 PM – 1:30 PM

A complimentary boxed lunch will be served in the Exhibition Hall (Rhinelander Gallery)

C&DP Lunch Networking Event

12:00 PM – 1:30

Sponsored by:



CONCURRENT SESSIONS

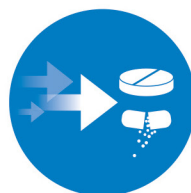
1:30 PM – 3:30 PM

See pages 16 & 17 for details.

**Ticket purchase required. Tickets can be purchased at registration while supplies last.*



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Monday, July 23 | 10:00 AM – 12:00 PM

BEEKMAN ROOM

SCIENTIFIC SESSION:

Nucleic Acid Delivery

Moderated by: Arash Hatefi**Session Chair:** Yu-Kyoung Oh**10:00 AM****I-5** *Nucleic Acid Carrier Optimization By Bioinspired Chemical Evolution***Ernst Wagner**, Ludwig Maximilians Univ., Germany**10:30 AM****I-6** *Controlled Intracellular Trafficking and Selective Tissue Targeting by Multifunctional Envelope-type Nano Device for Nucleic Acid Nanomedicine***Hideyoshi Harashima**, Hokkaido Univ., Japan**11:00 AM****9** *Using Calcium Phosphate Lipid-Coated Nanoparticles to Deliver Antisense Oligonucleotides to Motor Neurons in Amyotrophic Lateral Sclerosis***K. L. Vine¹**, C. Watson¹, L. Chen¹, M. Morsch², N. J. Cole³, D. N. Saunders⁴, J. Yerbury¹; ¹Illawarra Hlth. and Med. Res. Inst., Univ. of Wollongong, Wollongong, Australia, ²Dept. of BioMed. Sci., Macquarie Univ., Sydney, Australia, ³Dept. of BioMed. Sci., Faculty of Med. and Hlth. Sci., Macquarie Univ., Sydney, Australia, ⁴Sch. of Med. Sci., Univ. of New South Wales, Sydney, Australia**11:10 AM****10** *Nonviral Genome Editing Via CRISPR/cas9 Delivery By Membrane-disruptive And Endosomolytic Helical Polypeptide***H-X. Wang¹**, Z. Song², Y-H. Lao¹, J. Gong¹, M. Li¹, L. Yin³, J. Cheng², K. W. Leong¹; ¹Columbia Univ., New York, NY, ²Univ. of Illinois at Urbana-Champaign, Champaign, IL, ³Soochow Univ., Suzhou, China**11:20 AM****11** *Presaturating Kupffer Cells With Nanoprimers Improves Tumor Delivery of mRNA Nanoparticles In Vivo***M. S. Paolini¹**, F. Mpambani², M. Bergere², O. S. Fenton¹, A. K. Patel¹, L. Poul², R. S. Langer¹, M. Germain²; ¹MIT, Cambridge, MA, ²Nanobiotix, Paris, France**11:30 AM****12** *Lipid-polymer Hybrid Nanoparticles (LPNS) For Efficient Pulmonary Delivery Of Nucleic Acids: Lessons Learnt From Quality-by-design Based Optimization, Immunogenicity Studies, In Vitro Release Experiments, In Vivo Biodistribution And Efficacy Studies***K. Thanki¹**, A. Thakur¹, A. M. d. Groot², A. Geyer³, J. Fraire⁴, E. Falkenberg¹, H. V. Eygen¹, E. Putteman¹, D. C. v. Bijnen², X. Zeng¹, H. Sami³, S. Gehrig³, S. Justesen¹, H. Franzky¹, F. Broere², W. v. Eden², A. J. Sijts², M. Ogris³, H. M. Nielsen¹, K. Braeckmans⁴, C. Foged¹; ¹Univ. of Copenhagen, Copenhagen, Denmark, ²Utrecht Univ., Utrecht, Netherlands, ³Univ. of Vienna, Vienna, Austria, ⁴Ghent Univ., Ghent, Belgium**11:40 AM**

Panel Discussion

SUTTON CENTER

SCIENTIFIC SESSION:

Regional Delivery

Moderated By: Abraham Rubinstein**Session Chair:** Brian Amsden**10:00 AM****I-7** *Local Drug Delivery***Daniel Kohane**, Boston Children's Hospital, U.S.A.**10:30 AM****I-8** *Cancer-specific And Biologically-informed Biomaterials***Natalie Artzi**, Brigham and Women's Hospital, Harvard Medical School, U.S.A.**11:00 AM****13** *Leveraging Decreased Non-specific Adhesivity, Receptor-targeted (dart) Nanoparticles For Treatment Of Invasive Brain Tumors***A. Wadajkar¹**, J. Dancy¹, N. Connolly¹, N. Gorelick², B. Tyler², J. Winkles¹, G. Woodworth¹, A. Kim¹; ¹Univ. of Maryland Sch. of Med., Baltimore, MD, ²Johns Hopkins Univ. Sch. of Med., Baltimore, MD, U.S.A.**11:10 AM****14** *Extracellular Vesicle-based Hydrogels As Efficient Machinery For Anti-inflammatory Therapeutics Synthesis***G. Fuhrmann¹**, R. Chandrawati², P. A. Pamar³, T. J. Keane³, S. Bertazzo⁴, M. M. Stevens³; ¹Helmholtz-Inst. for Pharmaceutical Res., Saarbrücken, Germany, ²The Univ. of Sydney, Sydney, Australia, ³Imperial Coll., London, United Kingdom, ⁴Univ. Coll., London, United Kingdom**11:20 AM****15** *Ocular Pharmacokinetics Of A Dexamethasone-eluting Contact Lens***J. B. Ciolino¹**, B. Salvador-Culla¹, L. C. Bengani², R. Tulsan², A. E. Ross², D. S. Kohane³; ¹Massachusetts Eye & Ear/Harvard Med. Sch., Boston, MA, ²Schepens Eye Res. Inst. at Massachusetts Eye & Ear/Harvard Med. Sch., Boston, MA, ³Boston Children's Hosp./Harvard Med. Sch., Boston, MA**11:30 AM****16** *Electrospun Composite Scaffolds For Controlled Release Of The Bioactive Lipid, Siponimod To Augment Bone Regeneration***Z. Sartawi**, C. Waeber, K. Ryan; Univ. Coll. Cork, Cork, Ireland**11:40 AM**

Panel Discussion

BEEKMAN ROOM

MINI-SYMPOSIUM:

Advanced Immunotherapy For Neuro-Oncology

Session Chair: Julia Y. Ljubimova**10:00 AM****I-9** *Harnessing the host-immune system for glioma therapeutics: Impact of the tumor genotype***Maria Graciela Castro**, University of Michigan, U.S.A.**10:30 AM****I-10** *Superparamagnetic Iron oxide nanoparticles (SPIONs) for magnetic resonance imaging of macrophages in gliomas: at the interface between nanomedicine and innate immunity***Dmitri Simberg**, University of Colorado, U.S.A.**11:00 AM****I-11** *Nano immunology approach for the treatment of brain tumors: importance of brain local immune system activation***Julia Y. Ljubimova**, Cedars-Sinai Medical Center, U.S.A.**11:30 AM****I-12** *Cancer Nanotechnology – Current Status and Emerging Opportunities***Piotr Grodzinski**, National Cancer Institute, U.S.A.

Monday, July 23 | 10:00 AM – 12:00 PM (continued)

<p>SUTTON SOUTH</p> <p>INDUSTRY ROUNDTABLE: Pediatric Formulation Technologies and Considerations</p> <p>Moderated by: Sven Stegemann</p>	<p>GRAND BALLROOM</p> <p>SPECIAL SESSION: Development & Commercialisation of Nanomedicines - An Industry Perspective</p> <p>Session Co-Chairs: Marianne Ashford & Anand Subramony</p>	<p>SUTTON NORTH</p> <p>C&DP ROUNDTABLE: What's new beyond pharmaceuticals?</p> <p>Sponsored by:  MONSANTO</p> <p>Session Chair: Jeff Wu</p> <p>Moderated by: Doug Dale</p>
<p>Sponsored by:  Lonza Pharma & Biotech</p> <p>Sven Stegemann Professor for Patient-Centric Drug Development & Manufacturing, Graz University of Technology</p> <p>Karen Thompson Senior Principal Scientist, Preclinical Development, Merck</p> <p>Skylar Wolfe Manager, Clinical Supply External Manufacturing, BMS</p> <p>Matt Shaffer Senior Research Engineer, Lonza Pharma & Biotech</p>	<p>Marianne Ashford Astrazeneca, U.K.</p> <p>Anand Subramony MedImmune, U.S.A.</p> <p>Greg Troiano Pfizer, U.S.A.</p> <p>Scott McNeill Frederick National Laboratory for Cancer Research, U.S.A.</p> <p>Michelle Bradbury Memorial Sloan Kettering Cancer Center, U.S.A.</p>	<p><i>Encapsulation Technologies and Delivery Systems – An IP Perspective</i> Dr. Qingrong Huang Rutgers University, U.S.A.</p> <p><i>Novel Nanoencapsulation Technologies for Functional Food Applications</i> Shreya Dua Dolcera, U.S.A.</p> <p><i>Encapsulation & Release of Soluble Actives</i> Dr. Robert K. Prudhomme Princeton University, U.S.A.</p> <p><i>Challenges and Solutions for Delivery of Enzymes in Industrial Products</i> Dr. Doug Dale Dupont, U.S.A.</p> <p><i>VaporGrip – controlling the volatility potential of Dicamba</i> Dr. William Abraham Monsanto, U.S.A.</p>



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Monday July 23 | 1:30 PM-3:30 PM

<p>SUTTON NORTH</p> <p>INDUSTRY ROUNDTABLE: Inflection Point of Drug Formulation: Advanced in Silico Applications for Rational Drug Development</p> <p>Moderated By: Ronak Savla, Pharm.D., Ph.D. Catalent</p>	<p>BEEKMAN ROOM</p> <p>SPECIAL SESSION: Interactive Session with the World Molecular Imaging Society: Combining imaging and targeted drug delivery to create clinical impact</p> <p>Moderated By: Twan Lammers, RWTH Aachen University, Germany</p>	<p>SUTTON SOUTH</p> <p>SCIENTIFIC SESSION: Oral Delivery for Food and Pharma</p> <p>Moderated By: Venkatta Yelleppedi Session Chair: Ben Boyd</p>
<p>Sponsored by:</p>  <p><i>Simulation and Modeling Drug-Polymer Interaction and Drug Transport/Release through Excipient Polymer Gels presented by Ronald G. Larson</i> Department of Chemical Engineering, University of Michigan</p> <p><i>Integrated pharmacokinetic modelling to guide formulation development</i> Jan Neelissen Catalent Pharma Solutions</p>	<p>James Basilion Case Western Reserve University, U.S.A.</p> <p>Jan Grimm Memorial Sloan Kettering Cancer Center, U.S.A.</p> <p>Fabian Kiessling RWTH Aachen University, Germany</p> <p>Thomas Reiner Memorial Sloan Kettering Cancer Center, U.S.A.</p>	<p>1:30 PM I-13 <i>Specific High Uptake And Systemic Transport Of Nanoparticles At The Distal Ileum By Oral Dosing</i> You Han Bae, University of Utah, U.S.A.</p> <p>2:00 PM I-14 <i>Oral Peptide Delivery: The Potential Of Combining Nanoparticle Constructs With Permeation Enhancers</i> David Brayden, University of College Dublin, Ireland</p> <p>2:30 PM I-15 <i>Controlling The Release From Bioresponsive Platforms</i> Alireza Abbaspourrad, Cornell University, U.S.A.</p> <p>3:00 PM 17 <i>Multifunctional Nanoparticles Enable Efficient Oral Delivery of Biomacromolecules via Altering Transcytosis Pathway</i> Y. Zheng, Y. Huang; Sichuan Univ., Chengdu, China</p>

MONDAY • JULY 23



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Monday July 23 | 1:30 PM-3:30 PM (continued)

<p>REGENT ROOM</p> <p>MINI-SYMPOSIUM: Digitally Controlled Drug Delivery</p>	<p>SUTTON CENTER</p> <p>FOCUS GROUP SCIENTIFIC SESSION: Ocular Drug Delivery (OcDD)</p> <p>Session Chair: Morgan Fedorchak Session Co-Chair: Thakur Raghu Raj Singh</p>	<p>GRAND BALLROOM</p> <p>FOCUS GROUP SCIENTIFIC SESSION: Nanomedicine and Nanoscale Drug Delivery (NNDD)</p> <p>Session Chair: Bruno Sarmento Session Co-Chair: Helena Florindo</p>
<p>1:30 PM <i>Smart soft lens for diagnosis and delivery</i> Sei Kwang Hahn Department of Materials Science and Engineering, POSTECH, Republic of Korea</p> <p>2:00 PM <i>Smart bandage for precise dose control</i> Ali Tamayol University of Nebraska-Lincoln, U.S.A.</p> <p>2:30 PM <i>Opportunities and challenges in ingestible biosensors</i> Phillip Nadeau Analog Garage, U.S.A.</p> <p>3:00 PM <i>An ingestible bacterial-electronic system to monitor gastrointestinal health</i> Mark Kyle Mimee, Research Laboratory of Electronics, U.S.A.</p>	<p>1:30 PM <i>Complex Drug Products for Ocular Delivery</i> Uday Kompella, University of Colorado, U.S.A.</p> <p>2:00 PM 28 <i>Mucoadhesive Micelles For The Treatment Of Ocular Conditions</i> F. Lasowski, B. Muirhead, T. Rambarran, H. Sheardown; McMaster Univ., Hamilton, ON, Canada</p> <p>2:20 PM 306 <i>Gelatinized Core Liposomes: A New Trojan Horse For The Development Of A Novel Glaucoma Medication</i> R. M. Hathout, H. A. Gad, S. M. Abdel-Hafez, N. Nasser, N. Khalil, T. Ateyya, A. Amr, N. Yasser, S. Nasr, A. A. Metwally; Faculty of Pharmacy - Ain Shams Univ., Cairo, Egypt</p> <p>2:34 PM 230 <i>Investigation Of The Impacts Of Pegylation On The Intravitreal Distribution Of The Intravitreal Nanocarriers.</i> X. HUANG, Y. CHAU; Hong Kong Univ. of Sci. and Technology, Hong Kong, Hong Kong</p> <p>2:48 PM 57 <i>Laser-Assisted Microportation to Enhance Ocular Drug Delivery</i> R. Singh¹, S. Adwan², R. Donnelly¹; ¹Queens Univ. Belfast, Belfast, United Kingdom, ²Sch. of Pharmacy, Zarqa Univ., Zarqa, Jordan</p> <p>3:02 PM 656 <i>A Modified Hyaluronic Acid Based Instillable Hydrogel For The Treatment Of Dry Eye Syndrome In Dog Patients</i> Y. Yu¹, D. Chow², Y. Chau¹; ¹The Hong Kong Univ. of Sci. and Technology, Hong Kong, China, ²Vet. Specialty Hosp., Hong Kong, China</p> <p>3:16 PM 551 <i>Evaluation Of Antifibrotic Drug Nanowafers To Prevent Corneal Scarring</i> C. S. Shin, M. Zaheer, A. Zhu, R. Lee, J. Kim, G. Acharya; Baylor Coll. of Med., Houston, TX</p>	<p>1:30 PM I-16 <i>A Molecular Platform for RNA Therapeutics</i> Dan Peer, Tel Aviv University, Israel</p> <p>2:00 PM 260 <i>Machine Learning Processes to Develop Targeted Nanomedicines</i> D. A. Heller, Y. Shamay, J. Shah, M. Isik, J. D. Chodera; Mem. Sloan Kettering Cancer Ctr., New York, NY NNDD Focus Group Young Scientist Awardee</p> <p>2:20 PM 223 <i>Orally Delivered Butyrate-functionalized Nanovehicles To Overcome Multiple Barriers And Insight Into "Easy Entry, Hard Exit" Of Active Targeting System In Intestinal Absorption</i> L. Wu, Y. Huang; Sichuan Univ., Chengdu, China</p> <p>2:40 PM 225 <i>Multicellular Spheroids As Novel Tools For The Evaluation Of Melanoma Nano-vaccines And Braf-mek-targeted Nanomedicines.</i> A. Scomparin¹, S. Pozzi¹, E. Yeini¹, J. Connot², S. Koshrovski¹, E. Pisarevsky¹, H. Florindo², R. Satchi-Fainaro¹; ¹Tel Aviv Univ., Tel Aviv, Israel, ²Univ. of Lisbon, Lisbon, Portugal</p> <p>2:52 PM 226 <i>Biodegradable Polymalic Acid Conjugated To Angiopep-2 And Tri-leucine Traverses The Blood-brain-barrier And Distributes Throughout The Mouse Brain</i> L. L. Israel, O. Braubach, A. Galstyan, A. Chiechi, E. Shatalova, Z. Grodzinski, H. Ding, K. L. Black, J. Ljubimova, E. Holler; Cedars Sinai Med. center, Los Angeles, CA</p> <p>3:04 PM 255 <i>Tumor Penetration Promoting Polymeric Micelles Stabilized By π-π Stacking</i> X. Bai¹, G. Storm², W. Hennink², F. Kisseling¹, T. Lammers¹, Y. Shi¹; ¹RWTH Aachen Univ. Clinic, Aachen, Germany, ²Utrecht Univ., Utrecht, Netherlands</p> <p>3:16 PM 433 <i>Nanoparticle-based Vaginal Combination Therapy For The Prevention Of Inflammation-induced Preterm Birth</i> H. Zierden¹, J. Ortiz Ortiz¹, S. Bensouda¹, V. Laney¹, Y. Zou², J. Maziarz², J. Hanes¹, M. Mahendroo³, G. Wagner², L. Ensign¹; ¹Johns Hopkins Univ., Baltimore, MD, ²Yale Univ., New Haven, CT, ³Univ. of Texas Southwestern, Dallas, TX</p>

Monday July 23 *(continued)*

REFRESHMENT BREAK

3:30 PM – 4:00 PM | Rhinelander Gallery

PEARLS OF WISDOM

Targeted Nano-Drugs

4:00 PM – 5:00 PM | Grand Ballroom

In this session, two world-leading scientists will present different views and discuss controversies in the targeted nanomedicine field. The session will start with two short presentations, followed by 15 minutes of 1-on-1 discussion and 15 minutes of interactive discussion with the audience. Please make sure to join us for the memorable event.

Moderated by: Twan Lammers, RWTH Aachen University, Germany

"Should we be Disappointed?"

Gert Storm, Utrecht University, Netherlands



"Can we be Optimistic?"

Warren Chan, University of Toronto, Canada



POSTER PUB

5:00 PM – 6:00 PM | Rhinelander Gallery

Grab a drink and some face-time with poster presentations at this year's Poster Pub. The exhibit hall will be open at this time.

WOMEN IN SCIENCE NETWORKING EVENT*

6:00 PM – 7:00 PM | Regent Room

Honoring Molly Stevens
Imperial College London, U.K.



Focus Group Social Event

8:30 PM – 10:00 PM | Beekman Room

**Ticket purchase required. Tickets can be purchased at registration while supplies last.*

Tuesday, July 24 Morning Programming

PLENARY SESSION 3

Moderated by: Christine Allen, University of Toronto, Canada

I-17 Exploring and Engineering the Cell-material Interface for Drug Delivery

8:30 AM – 9:30 AM | Grand Ballroom

Molly Stevens
Imperial College London, U.K.



*Followed by An Interactive Session with Molly Stevens
9:30 AM – 10:00 AM | Grand Ballroom*

At the end of the plenary lecture, attendees can meet and greet with Molly Stevens to ask questions related to the scope of the talk, the science discussed, career advice, etc. This will be done in an informal and interactive setting.

REFRESHMENT BREAK

9:30 AM – 10:00 AM | Rhinelander Gallery

CONCURRENT SESSIONS

10:00 AM – 12:00 PM

See pages 19 & 20 for details.

LUNCH ON OWN

12:00 PM – 1:30 PM

CONCURRENT SESSIONS

1:30 PM – 3:30 PM

See pages 21 & 22 for details.



Tuesday, July 24 | 10:00 AM – 12:00 PM

<p>BEEKMAN</p> <p>SCIENTIFIC SESSION: Tropical and Transdermal Delivery</p> <p>Moderated By: Ying Chau & Bozena Michniak-Kohl Session Chair: Mark Prausnitz</p>	<p>SUTTON NORTH</p> <p>SCIENTIFIC SESSION: Delivery of Proteins, Peptides and Vaccines</p> <p>Moderated By: James Moon & Steven P. Schwendeman Session Chair: Tapashi Sengupta</p>	<p>SUTTON CENTER</p> <p>SCIENTIFIC SESSION: Encapsulation for Industrial Applications</p> <p>Moderated by: Yvonne Perrie Session Chair: Cornell Stamorman</p>
<p>10:00 AM</p> <p>I-18 <i>Controlled Transdermal Drug Delivery based on Onboard Wearable Biosensors</i> Dae-Hyeong Kim, Seoul National University, Seoul, Republic of Korea</p> <p>10:30 AM</p> <p>I-19 <i>Glucose-Responsive Smart Insulin Patch</i> Zhen Gu, University of North Carolina at Chapel Hill, U.S.A.</p> <p>11:00 AM</p> <p>18 <i>Microneedle Patches for Transdermal Antibiotic Delivery: Potential to Overcome Resistance.</i> R. Donnelly; Queen's Univ. Belfast, Belfast, United Kingdom</p> <p>11:10 AM</p> <p>19 <i>pH-sensitive Vancomycin Nanofibers for Localized Antimicrobial Applications: In Vitro And In Vivo Assessments</i> L. M. Abdel Rahman¹, H. M. M. Eltaher², K. Abdel-Raouf³, M. Bahey El-Din², C. Ismail², E. S. Kenawy⁴, L. K. El-Khordagui²; ¹Alexandria Pharmaceutical Company, Alexandria, Egypt, ²Alexandria Univ., Alexandria, Egypt, ³Hartford Hosp., Hartford, CT, ⁴Tanta Univ., Tanta, Egypt</p> <p>11:20 AM</p> <p>20 <i>Investigation Of The Permeation Of Solid Lipid Nanoparticles Loaded With Ketoconazole Into Skin Layers Using Spectroscopic Imaging Techniques</i> s. Gourion-Arsiquaud¹, S. Trehan², K. Wyluda¹, Q. Zhang¹, B. Michniak-Kohn², I. Pal Kaur³; ¹TRI Princeton, Princeton, NJ, ²Ctr. for Dermal Res., Rutgers Univ., Piscataway, NJ, ³Univ. Inst. of Pharmaceutical Sci., Chandigarh, India</p> <p>11:30 AM</p> <p>21 <i>Living Bacteria in Thermo-Responsive Gel For Treating Fungal Infections</i> M. Luton, E. Corem-Salkmon, B. Mizrahi; Technion, Haifa, Israel</p> <p>11:40 AM Panel Discussion</p>	<p>10:00 AM</p> <p>I-20 <i>Engineering Macrophage-derived Exosomes For Targeted Paclitaxel Delivery To Cancer Cells</i> Elena Batrakova, University of North Carolina at Chapel Hill, U.S.A.</p> <p>10:30 AM</p> <p>I-21 <i>The Power Of Chemoselectivity: Functional Antibody-conjugates For Extra- And Intracellular Targeting</i> Christian Hackenggerger, Leibniz-Forschungsinstitut für Molekulare Pharmakologie, Berlin, Germany</p> <p>11:00 AM</p> <p>22 <i>Polymeric Nanoparticles By Inverse Flash NanoPrecipitation: Formulation Design To Modify Release Of Biologics</i> C. E. Markwalter, R. F. Pagels, R. K. Prud'homme; Princeton Univ., Princeton, NJ, U.S.A.</p> <p>11:10 AM</p> <p>23 <i>Dendritic Cell-targeted Nano-vaccines Synergize With Immune Checkpoint Modulators For Melanoma Treatment</i> J. Conniot¹, A. Scomparin², C. Peres¹, E. Yeini², S. Pozzi², E. Zupancic³, S. Jung³, R. Satchi-Fainaro², H. F. Florindo¹; ¹Faculty of Pharmacy, Univ. of Lisbon, Lisbon, Portugal, ²Dept. of Physiology and Pharmacology, Sackler Faculty of Med., Tel Aviv Univ., Tel Aviv, Israel, ³Dept. of Immunology, The Weizmann Inst. of Sci., Rehovot, Israel</p> <p>11:20 AM</p> <p>24 <i>Calcitriol peptide Liposomes Suppress Antigen specific Autoreactive T Cell Expansion And Memory Differentiation To Regulate Autoimmune Arthritis</i> M. Talekar; Univ. of Queensland, 4102, Australia</p> <p>11:30 AM</p> <p>25 <i>Subcutaneous Elastin-like Polypeptides (ELP) Loaded With Rapamycin Alleviate Dacryoadenitis In A Model Of Sjögren's Syndrome</i> C. Lee¹, H. Guo¹, W. Klingam¹, S. Janga², F. Yarber², M. Edman², S. Peddi¹, S. F. Hamm-Alvarez², J. A. MacKay¹; ¹Dept. of Pharmacology and Pharmaceutical Sci., Sch. of Pharmacy, Univ. of Southern California, Los Angeles, CA, ²Dept. of Ophthalmology, Roski Eye Inst. and Keck Sch. of Med., Univ. of Southern California, Los Angeles, CA</p> <p>11:40 AM Panel Discussion</p>	<p>10:00 AM</p> <p>I-22 <i>A Novel, Continuous Microencapsulation Process for Industrial Applications</i> Steve Thomas, Cambridge Consultants, United Kingdom</p> <p>10:30 AM</p> <p>26 <i>Effect Of Encapsulation Of DNA On Lipidic Cubic Phase</i> S. Sarkar; RMIT, Melbourne, Australia</p> <p>10:40 AM</p> <p>27 <i>Systemic Study of Solvent-assisted Active Loading of Gambogic Acid Into Liposomes and Its Formulation Optimization for Improved Delivery</i> W-L. Tang, S-D. Li; Univ. of British Columbia, Vancouver, BC, Canada</p> <p>10:50 AM</p> <p>28 <i>Mucoadhesive Micelles For The Treatment Of Ocular Conditions</i> F. Lasowski, B. Muirhead, T. Rambarran, H. Sheardown; McMaster Univ., Hamilton, ON, Canada</p> <p>11:00 AM</p> <p>29 <i>Stabilization Of Bioinspired Non-spherical Cell Membrane-coated Nanoparticles By Lyophilization</i> B. M. Haryadi; Ludwig-Maximilians-Univ. München, Munich, Germany</p> <p>11:10 AM</p> <p>30 <i>Single-dose Azithromycin-loaded Nanoparticles-in-nanofibers Insert As A Therapy For Ocular Bacterial Infection</i> I. Khalil¹, I. G. Ali², I. M. El-Sherbiny³; ¹Misr Univ. for Sci. and Technology, Roxbury, MA, ²Nanomaterials Lab, Ctr. of Material Sci. (CMS), Zewail City of Sci. and Technology, Cairo, Egypt, ³Nanomaterials Lab., Ctr. of Material Sci. (CMS), Zewail City of Sci. and Technology, Cairo, Egypt</p> <p>11:20 AM</p> <p>31 <i>The Effect Of Processing Conditions On The Loading And Release From PLGA Microparticles</i> A. Otte¹, B. Soh², G. Yoon², K. Park¹; ¹Purdue Univ., West Lafayette, IN, ²Chong Kun Dang Pharmaceutical/Purdue Univ., West Lafayette, IN, U.S.A.</p> <p>11:30 AM</p> <p>32 <i>BAR-Encapsulated And BAR-Modified Nanoparticles For Oral Biofilm Applications</i> M. Y. Mahmoud, D. R. Demuth, J. M. Steinbach-Rankins; Univ. of Louisville, Louisville, KY, U.S.A.</p> <p>11:40 AM Panel Discussion</p>

Tuesday, July 24 | 10:00 AM – 12:00 PM *(continued)*

<p>SUTTON SOUTH</p> <p>SPECIAL SESSION: Toward an Improved Understanding of Complex Drug Substances and Complex Formulations Through GDUFA Regulatory Research Program</p> <p>Moderated by: Michail Kastellorizios & Lisa C. Rohan</p>	<p>REGENT ROOM</p> <p>MINI-SYMPOSIUM: Polymer Therapeutics Clinical Translation: Challenges and Opportunities</p> <p>Session Co-Chairs: Ronit Satchi-Fainaro & Maria Vicent</p>	<p>GRAND BALLROOM</p> <p>MINI-SYMPOSIUM: Antibody-Drug Conjugates</p> <p>Session Co-Chairs: Shawn C. Owen & Dhaval K. Shah</p>
<p>10:00 AM <i>Challenges and Opportunities for Innovation in Complex Generic Drug Product Development</i> Xiaohui (Jeff) Jiang, U.S. FDA, CDER, Office of Generic Drugs, U.S.A.</p> <p>10:25 AM <i>Development of Generic Long Acting Injectable and Implantable Drug Products: Regulatory Challenges and Considerations</i> Yan Wang, U.S. FDA, CDER, Office of Generic Drugs, U.S.A.</p> <p>10:55 AM <i>Dissecting Drug Release from Emulsions: A Balance Between Kinetics and Equilibrium</i> Xiaoming Xu, U.S., FDA, CDER, Office of Pharmaceutical Quality, USA</p> <p>Followed by a roundtable discussion.</p>	<p>10:00 AM I-23 <i>Reverting Cancer's Poor Prognosis Using Precision Nanomedicines Based On Molecular Fingerprints Of Long-term Versus Short-term Survivors</i> Marianne Ashford AstraZeneca, U.K.</p> <p>10:20 AM I-24 <i>Reverting Cancer's Poor Prognosis Using Precision Nanomedicines Based On Molecular Fingerprints Of Long-term Versus Short-term Survivors</i> Ronit Satchi-Fainaro Tel Aviv University, Israel</p> <p>10:40 AM I-25 <i>Polymeric Micelles at the Clinical Stage</i> Alexander Kabanov UNCH University of North Carolina Chapel Hill, U.S.A.</p> <p>11:00 AM I-26 <i>Control Architecture And Supramolecular Assembly In Polypeptide-based Conjugates</i> Maria Vicent CIPF Centro de Investigación Príncipe Felipe, Spain</p> <p>11:20 AM I-27 <i>Clinical Challenges towards Next Generation Polymeric Nanomedicines</i> Horacio Cabral University of Tokyo, Japan</p>	<p>10:00 AM <i>Strategies to Potentiate Antibody Drug Conjugates</i> Shawn C. Owen University of Utah</p> <p>10:20 AM <i>Role of PK/PD in ADC Development</i> Dhaval K. Shah University at Buffalo, U.S.A.</p> <p>10:40 AM I-28 <i>Application of the ClassicDiels-Alder Reaction for Production of Antibody-Drug Conjugates</i> R. James Christie Medimmune, U.S.A.</p> <p>11:00 AM I-29 <i>Development Of Potent And Efficacious Maytansinoid ADCs</i> Thomas Nittoli Regneron Pharmaceuticals, U.S.A.</p> <p>11:20 AM <i>Drugging intractable targets with antibodies</i> David A. Scheinberg Memorial Sloan Kettering Cancer Center, U.S.A.</p>



Tuesday July 24 | 1:30 PM – 3:30 PM

<p>BEEKMAN</p> <p>SCIENTIFIC SESSION: Parenteral Controlled Release</p> <p>Moderated By: Anna Schwendeman Session Chair: Diane Burgess</p>	<p>SUTTON NORTH</p> <p>SCIENTIFIC SESSION: Manufacture, Characterization, Measurement, and Stability</p> <p>Moderated By: Richard A. Gemeinhart Session Chair: Ali Rajabi-Siahboomi</p>	<p>REGENT ROOM</p> <p>MINI-SYMPOSIUM: Cells as Delivery Vehicles</p> <p>Session Co-chairs: Jana Portnow & Zhenjia Wang</p>
<p>1:30 PM</p> <p>I-31 <i>Engineering Microneedles For Stimulating and Sampling Immunity</i> Darrell Irvine, MIT, U.S.A</p> <p>2:00 PM</p> <p>I-31 <i>Targeting inflammation and immune dysregulation in neonatal and pediatric CNS disorders</i> Sujatha Kannan, John Hopkins University, U.S.A.</p> <p>2:30 PM</p> <p>33 <i>Harnessing Fibroblast Growth Factor-inducible 14 (fn14) For Targeting Metastatic Triple Negative Breast Cancer</i> J. G. Dancy, A. S. Wadajkar, G. F. Woodworth, J. A. Winkles, A. J. Kim; Univ. of Maryland Sch. of Med., Baltimore, MD</p> <p>2:40 PM</p> <p>34 <i>Computationally-designed Nanotherapeutics For Targeting Immunosuppressive Cells In The Tumor</i> A. Kulkarni¹, S. Natarajan², V. Chandrasekar², S. Sengupta²; ¹Univ. of Massachusetts Amherst, Amherst, MA, ²Brigham and Women's Hosp., Cambridge, MA</p> <p>2:50 PM</p> <p>35 <i>Controlled Drug Releasing System Using Biodegradable Temperature-responsive Injectable Polymers Containing Liposome</i> Y. Yoshizaki¹, H. Yamamoto², A. Kuzuya³, Y. Ohya³; ¹ORDIST, Kansai Univ., Osaka, Japan, ²Faculty of Chemistry, Materials and Bioengineering, Kansai Univ., Osaka, Japan, ³CEMP, Kansai Univ., Osaka, Japan</p> <p>3:00 PM</p> <p>36 <i>Long Acting Injectable Suspension with High Drug Load Aided by Inorganic Nanoshells</i> J. Hellrup, E. Mårtensson, A. Johansson, M. Rooth; Nanexa AB, Uppsala, Sweden</p> <p>3:10 PM Panel Discussion</p>	<p>1:30 PM</p> <p>I-32 <i>Nanostructured Carriers For Controlled Release - Characterization And Stability</i> Maria Lundin Johnson, Research Institutes of Sweden, Sweden</p> <p>2:00 PM</p> <p>37 <i>Design And Physicochemical Characterization Of Fenofibrate Solid Dispersion By Supercritical Antisolvent Process</i> J. Ahn, S-E. Lee, J-S. Park, K-S. Heo, C-S. Myung; Chungnam Natl. Univ., Daejeon, Republic of Korea</p> <p>2:10 PM</p> <p>38 <i>Dispersibility Of Phospholipids In Supercritical Carbon Dioxide For Preparation Of Liposomes</i> F. Maqbool, P. M. Moyle, J. R. Falconer; The Univ. of Queensland, Brisbane Australia, Brisbane, Australia</p> <p>2:20 PM</p> <p>39 <i>Radiolabeling Of Cell Membrane-Based Nano-Carriers Facilitates Robust And Sensitive Quantification Of Their Biodistribution And Pharmacokinetics</i> N. Letko Khait, M. Machluf; Technion - Israel Inst. of Technology, Haifa, Israel</p> <p>2:30 PM</p> <p>40 <i>Fabrication And Physico chemical Characterization Of Biodegradable Intra ocular Implant Of Budesonide</i> F. Abedin Dorkoosh; Tehran Univ. of Med. Sci., Tehran, Islamic Republic of Iran</p> <p>2:40 PM</p> <p>41 <i>Thermal Analysis By Structural Characterisation (TASC) As A Novel Preformulation Tool For Drug-polymer Miscibility Screening</i> M. Alhijaj¹, P. Belton², L. Fabian¹, N. Wellner³, M. Reading⁴, S. Qi¹; ¹Sch. of Pharmacy / Univ. of East Anglia, Norwich, United Kingdom, ²Sch. of Chemistry / Univ. of East Anglia, Norwich, United Kingdom, ³Quadram Inst. BioSci., Norwich Res. Park, Norwich, United Kingdom, ⁴Cyversa, Norwich, United Kingdom</p> <p>2:50 PM</p> <p>42 <i>Advanced Fluorescent pH-Sensitive PLGA Particles for Controlled Targeted Therapeutic Delivery and Mapping Microenvironmental Biochemical Parameters</i> V. M. Chauhan, M. Al-Natour, A. A. Selo, D. J. Scurr, R. Markus, C. Alexander, J. W. Aylott; Univ. of Nottingham, Nottingham, United Kingdom</p> <p>3:00 PM</p> <p>43 <i>Very Large Scale Droplet Microfluidic Integration For Industrial Scale Production Of Biodegradable Microparticles.</i> S. Yadavali; Univ. of Pennsylvania, Philadelphia, PA</p> <p>3:10 PM Panel Discussion</p>	<p>1:30 PM</p> <p><i>Neural stem cells as delivery vehicles</i> Jana Portnow, City of Hope National Medical Center, U.S.A.</p> <p>2:00 PM</p> <p><i>Neutrophils for drug delivery to inflammation and infection</i> Zhenjia Wang, Washington State University, U.S.A.</p> <p>2:30 PM</p> <p><i>Red blood cells for delivery of drugs, biologicals, and nanoparticles</i> Vladimir Muzykantov, Department of Systems Pharmacology and Translational Therapeutics, U.S.A.</p> <p>3:00 PM</p> <p><i>Remotely controlled red blood cells for cancer targeted delivery</i> Zhuang Liu, Institute of Functional Nano & Soft Materials (FUNSOM), The Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices, Soochow University, China</p>

Tuesday July 24 | 1:30 PM – 3:30 PM (continued)

<p>SUTTON CENTER</p> <p>SPECIAL SESSION: Implant Formulation Optimization and In Vivo Performance</p> <p>Moderated by: Thierry Vandamme</p>	<p>GRAND BALL ROOM</p> <p>SPECIAL SESSION: CRS 45th Anniversary Celebration</p> <p>Moderated by: Mark Prausnitz</p>	<p>SUTTON SOUTH</p> <p>FOCUS GROUP SCIENTIFIC SESSION Oral Drug Delivery (OrDD)</p> <p>Session Chair: Katie Whitehead Session Co-Chair: Aaron Anselmo</p>
<p>Diane Burgess University of Connecticut, U.S.A.</p> <p>Long acting injections and implants improve therapy, enhance patient compliance, improve dosing convenience, and are the most appropriate formulation choice for drugs that undergo extensive first pass metabolism or that exhibit poor oral bioavailability. An intriguing variety of technologies have been developed to provide long acting injections and implants. Many considerations need to go into the design of these systems in order to translate a concept from the lab bench to actual therapy for a patient. Implants formulation optimization will be discussed and illustrated with in vitro and in vivo performance as well as performance testing.</p>	<p>This year, the Controlled Release Society is hosting its 45th Annual Meeting and are celebrating by taking a look at the past - present - and future of CRS.</p> <p>1:40 PM Nicholas Peppas Former CRS President 1987-1988</p> <p>2:10 PM Ron Siegel Former CRS President 1997-1998</p> <p>2:30 PM Diane Burgess Former CRS President 2009-2010</p> <p>2:50 PM Martyn Davies Former CRS President 2011-2012</p> <p>3:05 PM Panel discussion on the status of Controlled Release Science and CRS activities in the future. Moderated by Maria Jose Alonso</p>	<p>1:30 PM I-33 Overcoming Barriers to Oral Protein Delivery Randall Mrsny, University of Bath, United Kingdom</p> <p>2:00 PM 32 BAR-Encapsulated And BAR-Modified Nanoparticles For Oral Biofilm Applications M. Y. Mahmoud, D. R. Demuth, J. M. Steinbach-Rankins; Univ. of Louisville, Louisville, KY OrDD Focus Group Young Investigator Award Winner</p> <p>2:25 PM 455 Development Of A Microstructured In Vitro 3D Model Of The Small Intestine Epithelium Using Poly(ethylene) Glycol Diacrylate Scaffolds M. Garcia-Diaz, A. G. Castaño, N. Torras, G. Altay, E. Martinez; IBEC - Inst. for Bioengineering of Catalonia, Barcelona, Spain</p> <p>2:45 PM 459 Oral Permeability And Pharmacokinetics Of A Pediatric Formulation For The Treatment Of Cerebral Palsy V. K. Yellepeddi¹, R. Mohammadipur¹, C. Sayre², S. Khambampati³, M. Mishra³, R. Kannan³, H. Ghandehari¹; ¹Univ. of Utah, Salt Lake City, UT, ²Roseman Univ. of Hlth. Sci., Salt Lake City, UT, ³Johns Hopkins Univ., Baltimore, MD, U.S.A.</p> <p>3:00 PM 133 Potential Of Hydrophobic Amino Acid Tryptophan As An Absorption Enhancer For The Oral Delivery Of Biopharmaceuticals N. Kamei, H. Tamiwa, M. Miyata, M. Takeda-Morishita; Kobe Gakuin Univ., Kobe, Japan</p> <p>3:15 PM 462 Mechanistic Modeling And Prediction Of The Effect Of Food On Oral Drug Absorption O. Rezhdo, L. S. Speciner, R. L. Carrier; Northeastern Univ., Boston, MA, U.S.A.</p>

REFRESHMENT BREAK

3:30 PM – 4:00 PM | Rhinelander Gallery

AWARDS AND CLOSING CEREMONY

4:00 PM – 4:30 PM | Grand Ballroom

Awards will be given out for best poster and oral presentations.

Passport 2 Prizes game winners will be announced, winners must be present to win

Exposition Hall (Rhineland Gallery)

The CRS Exposition is the place to CONNECT and discover the latest delivery science and technology trends! Meet face-to-face with leading companies from around the world—learn about new products, discuss industry challenges, and build your network. *2018 Exhibitors as of (6/1/2018)*

Detailed description of current Exhibitors and the schedule of Exposition hours can be found in the CRS Meeting App.

Exhibit Hall Hours

Sunday 5:00 PM - 7:00 PM

Monday 9:00 AM - 4:30 PM
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