2016 PROGRAM

Controlled Release Society Annual Meeting & Exposition

July 17–20, 2016 • Seattle, Washington, U.S.A.

CRS
Leading
Delivery Science
and Technology

#CRSseattle

controlledreleasesociety.org/meeting

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2016 CRS Meeting App

- Program Guide
- Abstracts
- Appointment Maker
- Exposition
- Personal Schedule & To-do List
- Local Seattle Attractions, Restaurants & More!

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Search "CRS Meeting" in your app store.

WiFi access in the convention center:

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Password: science1

Table of Contents

2016 Annual Meeting Program Committee

Thank you to this year's Annual Meeting Program Committee for their time and talents in planning this outstanding program.

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Purdue University, U.S.A.

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University College Dublin, Ireland

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University College London, United Kingdom

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KIST, Korea

Samir Mitragotri
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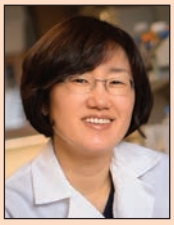
Claudio Ortiz
Colgate Palmolive, U.S.A.

Mark Tracy
Tracy BioConsulting, LLC, U.S.A.

Hong Wen
FDA, U.S.A.

Jennifer Wong
University of Sydney, Australia



Yoon Yeo
Purdue University, U.S.A.

General Meeting Information

Share Your Photos & Experiences

#CRSseattle

Registration

The CRS Central and self-serve kiosks are located in the Atrium Lobby on Level 4. You can modify your registration and print your badges at the self-serve kiosks. Name badges can only be printed at the kiosk one time. CRS staff will be available at the CRS Central.

Your CRS name badge must be worn at all times in the convention center and at all scheduled CRS events.

Access the Abstracts

CRS Annual Meeting abstracts can easily be accessed using the **CRS Meeting App** and the CRS website. Within the app, click on the Presenters icon to view abstracts. Sign into the **CRS website** to view and search the abstracts, available to all registered attendees.

Exposition Location

The Exposition is located in Room 4AB on Level 4. The detailed schedule of Exposition activities can be found via the CRS Meeting App.

Poster Sessions

The posters are located in the Exhibit Hall, Room 4AB on Level 4. Details on when poster authors will be present can be found via the CRS Meeting App. All posters must be removed during Poster Take-Down or they will be removed and discarded. The poster viewing area will be secured overnight. Photographing posters is not permitted.

Speaker Preparation Room

The Speaker Preparation Room is located in Room 303 on Level 3 and is available for PowerPoint previewing and uploading presentation materials. Speakers are to upload presentations one day prior to their presentation date (e.g., if you speak on Monday, July 18, you will upload your presentation on Sunday, July 17). Presenters are not allowed to use their own laptops to give their presentations. Detailed hours of when the Speaker Ready Room is open can be found in the CRS Meeting App.

Electronic Devices

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

Photography

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

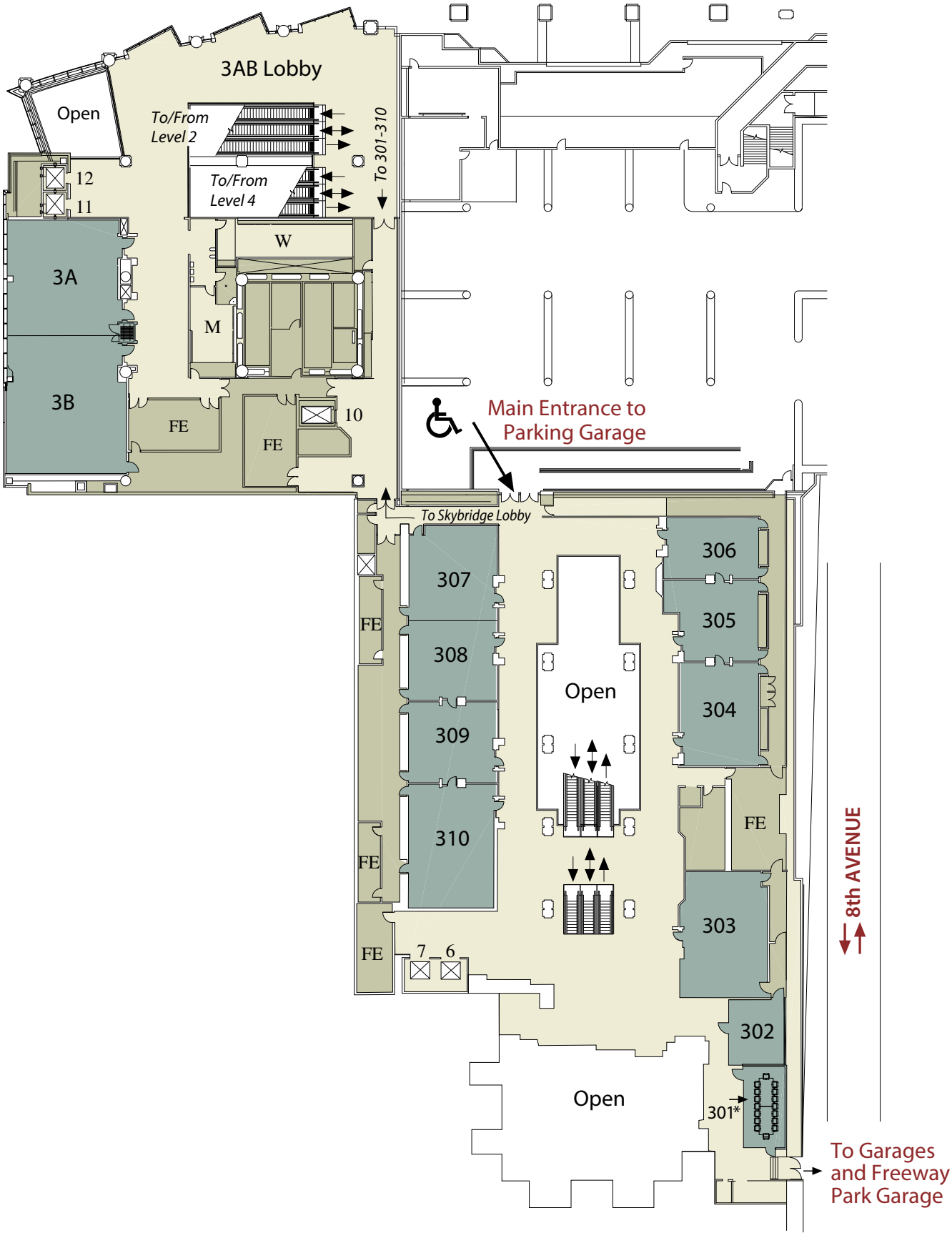
Photo Release

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

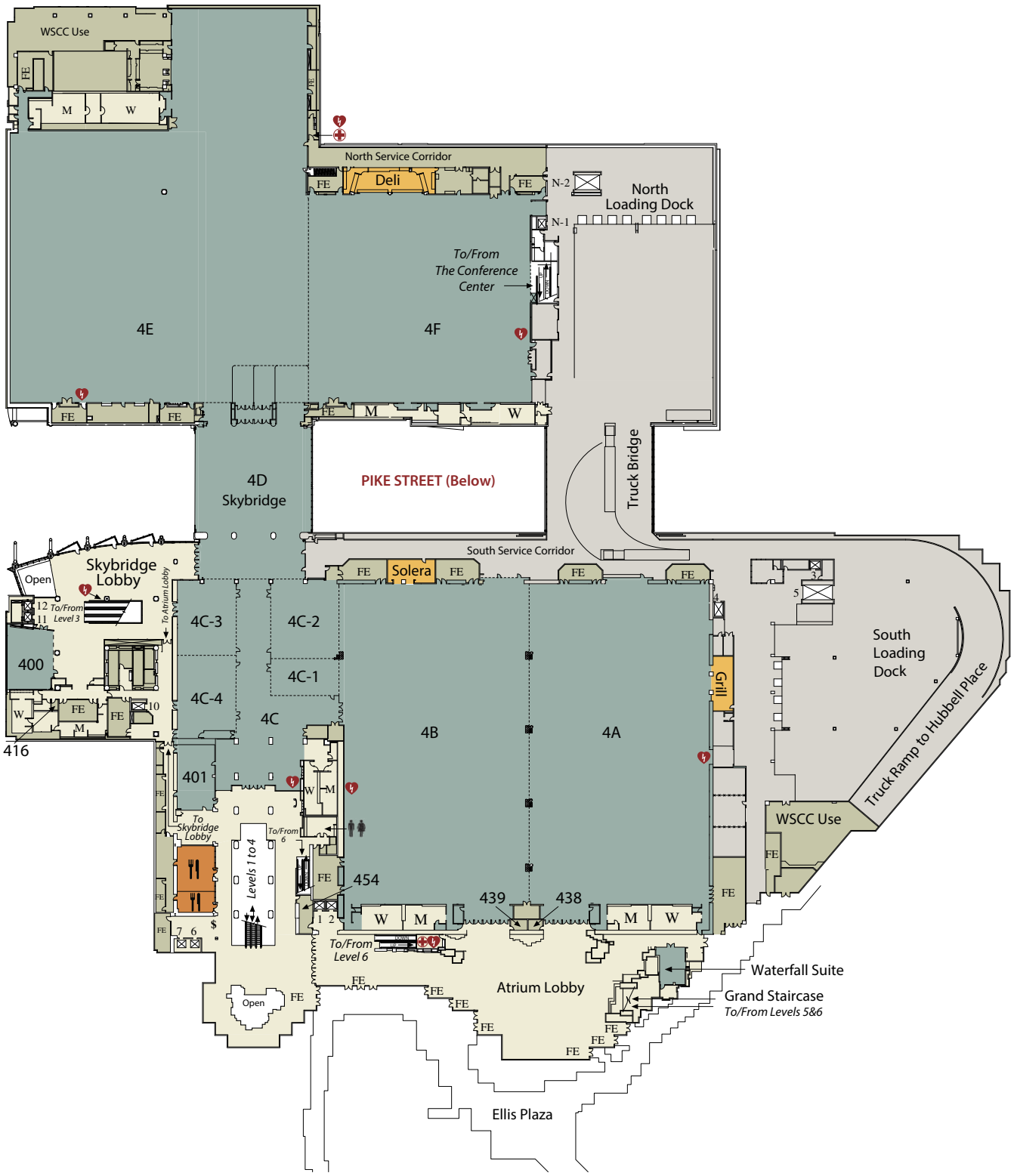
Children and the CRS Annual Meeting & Exposition

The CRS Annual Meeting & Exposition is a professional, scientific meeting. CRS does not permit children 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. Children 18+ must register and buy applicable individual tickets if not attending/registering as a student.

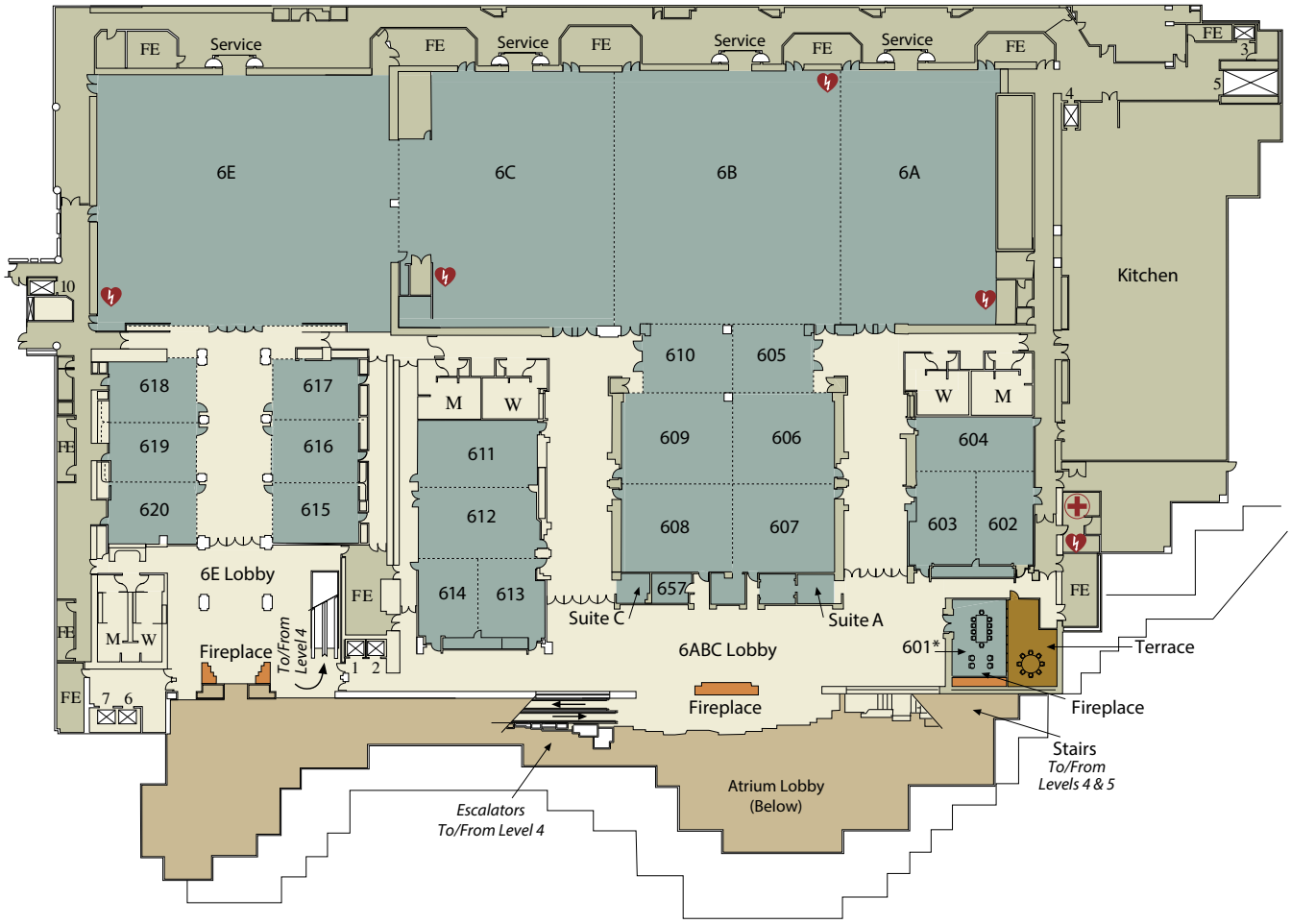
Washington State Convention Center – Level Three



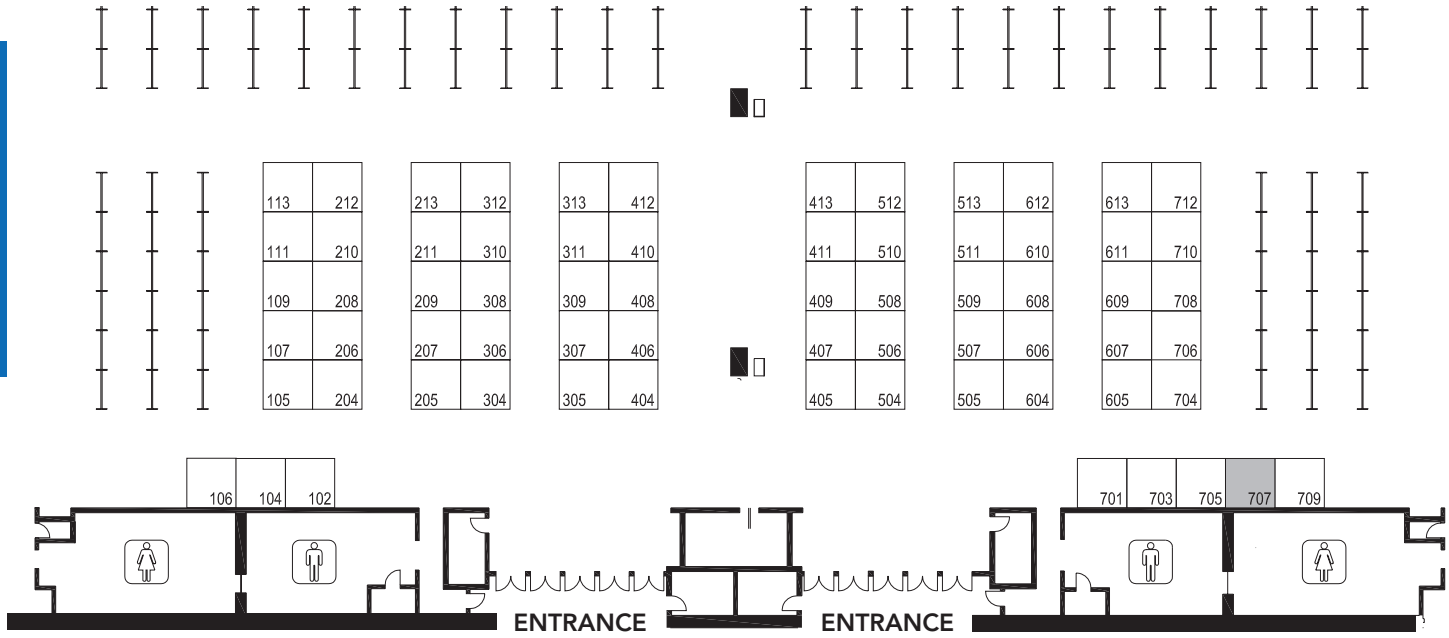
Washington State Convention Center – Level Four Exhibit Halls



Washington State Convention Center – Level Six
Ballrooms & Meeting Rooms



Washington State Convention Center
Exposition



102 O'Hara Technologies Inc.
104 Springer
105 Agilent Technologies
106 Elsevier
107 Quotient Clinical
113 PharmaCircle LLC
204 Certara
205 Patheon
207 Anton Paar USA
208 Advanced Polymer Materials Inc.
209 ProMed Pharma LLC
210 ISPG, Inc.
211 Sirius Analytical, Inc.
212 CordenPharma
213 Oakwood Labs
304 PolyMicrospheres-Advanced Nanotech
305 Malvern Instruments
306 FlackTek, Inc.
307 Simulations Plus, Inc.
308 Freund-Vector Corp.
309 MedPharm
310 Shin-Etsu Chemical Co., Ltd.
311 Suven Life Sciences Limited
312 Hanson Research Corp.
313 Corbion Purac Biomaterials
404 Evonik Corporation
405 Gattefossé
406 Avanti Polar Lipids, Inc.
407 SOTAX
408 Wyatt Technology Corporation
409 Celanese
410 Southwest Research Institute
411 MilliporeSigma
412 Catalent Pharma Solutions
413 DURECT Corporation/Lactel Absorbable Polymers
504 Capsugel
505 Lipoid, LLC
506 Akina, Inc.: PolySciTech Division
507 Polymun Scientific Immunbiologische Forschung GmbH
508 LCI Corporation
509 Gaylord Chemical Company
510 NanoImaging Services, Inc.
511 Texture Technologies Corp.
512 Colorcon
513 Precision NanoSystems Inc.
604 TRANSFERRA Nanosciences Inc.
605 InSitu Biologics
606 IMA North America, Inc.
607/609 Fuji Health Science, Inc.
608 Logan Instruments Corp.
610 Ashland Inc.
611 NOF Corporation
612 Spraybase
613 Microfluidics International Corporation
701 LTS Lohmann Therapy Systems
703 Taylor & Francis Group
704 Adhesives Research/ARx, LLC
705 Pantec Biosolutions AG
706 EmulTech b.v.
707 Absorption Systems
709 Mikron Automation
712 3M Drug Delivery Systems

As of June 20, 2016

Saturday, July 16

Schedule-at-a-Glance

8:00 a.m. – 12:00 p.m.	CRS Board of Directors Meeting • Westin Hotel, Puget Sound
8:00 a.m. – 5:00 p.m.	Exposition Set-Up • Room 4AB
11:30 a.m. – 5:00 p.m.	CRS Registration Open • Atrium Lobby, Level 4
11:30 a.m. – 5:00 p.m.	Speaker Preparation Room Open • Room 303

Program Highlights

Premeeting Workshop*

Regulatory Landscape of Complex Drug Products*
8:30 a.m. – 5:00 p.m. • Room 608–609

Young Scientist Programming

Young Scientist Professional Development Workshop: Finding Your Career Edge
12:30 – 5:00 p.m. • Room 611–612

Young Scientist Speed Mentoring Event
5:00 – 6:00 p.m. • Room 604

Sunday, July 17

Schedule-at-a-Glance

7:30 a.m. – 5:00 p.m.	Speaker Preparation Room Open • Room 303
7:30 a.m. – 6:30 p.m.	CRS Registration Open • Atrium Lobby, Level 4
8:00 a.m. – 1:00 p.m.	Scientific Program
8:00 a.m. – 2:00 p.m.	Exposition and Poster Set-Up • Room 4AB
9:00 a.m. – 1:00 p.m.	Technology Forums
1:30 – 2:00 p.m.	Opening Session and Award Ceremony • Room 6B
2:00 – 2:45 p.m.	CRS Founders Award Lecture - Hans Junginger • Room 6B
2:00 – 4:30 p.m.	Scientific Program
4:30 – 6:30 p.m.	Exposition Grand Opening & Reception with Poster Viewing • Room 4AB

Program Highlights

Premeeting Workshops

Innovative Formulation Approaches to Improve Early Stage Development*
Sponsored by Catalent Pharma Solutions
8:00 a.m. – 1:00 p.m. • Room 608-609

Young Scientist Programming

Protecting Your Innovation: A Joint VOLD-YSC Workshop on Key Concepts of Intellectual Property
9:00 a.m. – 12:00 p.m. • Room 611–612

Young Scientist Meet & Greet – NEW!
12:00 – 1:00 p.m. • Room 611–612

CRS Founders Award Lecture

Forks of Crossroads – or – Failures and Successes in a Scientific Life
2:00 – 2:45 p.m. • Room 6B

Hans Junginger
Retired Leiden University, Germany
Moderator: Alexander Florence

Industry Roundtable

Drug Delivery in the Context of Global Health
Sponsored by Pfizer
3:00 – 4:30 p.m. • Room 6A

Other Program Highlights

First Timers' Meeting
1:00 – 1:30 p.m. • Room 6A

Opening Session and Awards Ceremony
1:30 – 2:00 p.m. • Room 6B

Exposition Grand Opening and Welcome Reception
4:30 – 6:30 p.m. • Room 4AB

Young Scientist Networking Event*
9:00 – 11:00 p.m. • Rhein Haus (offsite)

**Additional registration, payment, and ticket required*

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CRS
Leading Delivery Science and Technology

Technology Forums – Sunday, July 17

These forums are open to all registered attendees on a complimentary basis, offering in-depth coverage of delivery and release technologies and services, hosted by the following companies. Detailed descriptions of the individual forums can be found on the CRS Meeting App.

Fuji Chemical Industries Co.,Ltd.

The Use of Inorganic Excipients for the Development of Oral Solid Dosage Forms by Means of Extrusion Processes
9:00 – 10:00 a.m. • Room 605

Agilent Technologies

Tools of the Trade: Agilent 280-DS and Enhanced Mechanical Qualification of the Dissolution Apparatus
9:00 – 10:00 a.m. • Room 610

EVONIK INDUSTRIES

Debunking the Myths of Complex PLG Formulations
9:00 – 10:00 a.m. • Room 613

WYATT TECHNOLOGY

The Light Scattering Toolkit for Characterization and Formulation of Drug Delivery Nanoparticles
9:00 – 10:00 a.m. • Room 614

sotax
Solutions for Pharmaceutical Testing

A Novel Method for the Elution of Sirolimus (Rapamycin) in a Drug-Eluting Device
10:30 – 11:30 a.m. • Room 605

SUVEN Life Sciences

Preclinical Pharmacokinetic Services for Formulation Development of 505(b)(2) and ANDA Products
10:30 – 11:30 a.m. • Room 610

EVONIK INDUSTRIES

EUDRATEC® – Innovative Formulation Technologies for Advanced Drug Delivery
10:30 – 11:30 a.m. • Room 613

Colorcon®

Approaches to Taste Masking of Particles for Oral Application and Examination of a Novel Biorelevant Dissolution Testing Methodology
10:30 – 11:30 a.m. • Room 614

CAMBRIDGE DESIGN PARTNERSHIP

Smarter Combination Products: Development Strategies to Reduce Risk and Shorten Time to Launch
12:00 – 1:00 p.m. • Room 605

NCL Nanotechnology Characterization Laboratory

Nanoparticle Characterization and Reformulation Opportunities
12:00 – 1:00 p.m. • Room 610

EmulTech
ADD CONTROL TO YOUR EMULSION

Development and Manufacturing of Sustained Release Microspheres Using Microfluidic Encapsulation
12:00 – 1:00 p.m. • Room 613

GRÜNENTHAL

INTAC – A Versatile Hot-Melt Extrusion Platform to Create Outstanding Product Performance
12:00 – 1:00 p.m. • Room 614

Scientific Program • Monday 8:30 – 10:00 a.m.

Room 608–609

Delivery Technologies in Cosmetics, Personal Care, and Household Products

Moderator: Ron Veršič
Session Chairs: Claudio Ortiz and Fanwen Zeng

Invited Speaker

8:35 AM **2**
Bijel capsules – a novel architecture for simultaneous delivery of hydrophilic and hydrophobic materials
Job Thijssen, The University of Edinburgh, United Kingdom

Research Highlight Talks

9:15 AM **60**
Engineering Chitosan-Calcium Tripolyphosphate Composite Microparticles: From Core/Shell to Coated Matrix and Coated Reservoir Microencapsulation System
Fideline Tchuenbou-Magaia, University of Birmingham, United Kingdom

9:23 AM **64**
Amine-modification of Silica Nanoparticles Reduces Lung Inflammation in Mice
Angie Morris, University of Iowa. U.S.A.

9:31 AM **61**
Rheological Characterization and In Vitro Permeation of Menthol Gels for Topical Application
Mahima Manian, Mercer University, U.S.A.

9:39 AM **63**
Evaluation of in vitro evaporation profile of a natural insect repellent (citronella oil) impregnate in mesoporous silica
Nestor Mendoza Munoz, University of Colima, Mexico

9:47 AM **65**
The Effect of Aldehydes on Polyurea Encapsulated Fragrance for Consumer Products
Timothy Evans-Lora, Symrise Inc., U.S.A.

Room 611–614

Integration of Imaging and Drug Delivery

Moderator: Ick Chan Kwon
Session Chairs: Michael Dunne and Twan Lammers

Invited Speaker

8:35 AM **5**
Current and future opportunities for image-guided nanotherapy
Katherine Ferrara, University of California-Davis, U.S.A.

Research Highlight Talks

9:15 AM **129**
Monitoring disposition of lipid-based formulations for sustained release using X-ray CT imaging
Ben Boyd, Monash University, Australia

9:23 AM **130**
Real-Time Volumetric Imaging of Nanoparticle Transport in the Rat Cortex
Justin Rosch, Cornell University, U.S.A.

9:31 AM **125**
Dual-Targeting Immunoliposomes Conjugated with Anti-CD133 mAb and Angiopep-2 for GSCs
Jung Seok Kim, Sookmyung Women's University, South Korea

9:39 AM **124**
Augmenting drug-carrier compatibility improves tumor nanotherapy efficacy
Yiming Zhao, Icahn School of Medicine at Mount Sinai, U.S.A.

9:47 AM **110**
A Nanomedicine Biodegradable Platform for Image-Guided Surgery and Intraoperative Phototherapy for Ovarian Cancer Treatment
Oleh Taratula, Oregon State University, U.S.A.

Room 6B

Oral Delivery

Moderator: Cornell Stamoran
Session Chairs: Hong Wen and Yan Wang

Invited Speakers

8:35 AM **16**
Recent developments in locally acting gastrointestinal drugs with an emphasis on how to determine local drug dissolution
Mansoor Khan, Texas A&M Health Science Center, U.S.A.

9:00 AM **17**
Understanding Critical Excipient Properties to Ensure Consistent Quality of Amorphous Solid Dispersion and Extended-Release Products
Yihong Qiu, AbbVie, U.S.A.

Research Highlight Talks

9:08 AM **327**
ROS-scavenging Nanoparticle Increases Chemotherapeutic Effect with Reducing Gastrointestinal Toxicity of Conventional Drugs
Binh Long Vong, University of Tsukuba, Japan

9:16 AM **384**
Development of a gastro-resistant (GR) formulation of a weak acid drug and evaluation of its pharmacokinetic (PK) impact
Pedro Barrocas, BIAL - Portela & Co., S.A., Portugal

9:24 AM **383**
Application of Fused Deposition Modeling (FDM) 3D printing in the fabrication of pharmaceutical oral solid dispersions for the delivery of poorly soluble drugs
Sheng Qi, University of East Anglia, United Kingdom

9:32 AM **391**
Combining Lipophilic Prodrugs and Lipid Based Nanomedicine to Convert Injectable to Oral Chemotherapy
Clive Prestidge, University of South Australia, Australia

Room 6A

Enabling Patient Centric Products through Drug Delivery Technologies Industry Roundtable

Sponsored by

MedImmune
A member of the AstraZeneca Group

Moderator: Anand Subramony

The session will focus on controlled release of peptides/proteins as well as the utility of nanomedicines for the development of innovative medicines. Nanomedicines can enable novel drug products by changing a molecule's drug distribution and releasing at the site/tissue of interest. The biodistribution change in combination with controlled release from a nanoparticle has the potential to improve the therapeutic index. While the controlled release of small molecules is well understood, technologies for the programmed release of large molecules has been challenging due to the physicochemical aspects of such molecules particularly size and hydrophobic nature. Emerging approaches in the area of nanoparticles for targeted delivery and sustained release of large molecules will be reviewed.

Invited Speakers

8:30 AM
Anand Subramony, MedImmune

8:50 AM
Alexander Schwarz, MedImmune

9:10 AM
Marianne Ashford, AstraZeneca

9:30 AM
Moderated Discussion

Schedule-at-a-Glance

7:30 a.m. – 6:30 p.m.	CRS Registration Open • Atrium Lobby, Level 4
8:00 a.m. – 5:00 p.m.	Speaker Preparation Room Open • Room 303
8:30 – 10:00 a.m.	Scientific Program
10:15 – 11:15 a.m.	Plenary Session • Room 6B
11:15 a.m. - 1:00 p.m.	Exposition and Poster Session – Lunch included – **NEW!**
12:00 – 12:30 p.m.	Even Numbered Poster Authors Present
12:30 – 1:00 p.m.	Odd Numbered Poster Authors Present

Program Highlights

Industry Roundtables

Enabling Patient Centric Products through Drug Delivery Technologies
Sponsored by MedImmune
8:30 – 10:00 a.m. • Room 6A

Plenary Session

Dr. Allan Hoffman and the Allan Hoffman Student Travel Grant awardees will be recognized in this session.

Application of Controlled Release and Drug Delivery Technology to Address Global Health Needs
10:15 – 11:15 a.m. • Room 6B

Susan Hershenson
The Bill and Melinda Gates Foundation, U.S.A.
Moderator: Vince Lee

Room 611–614

Manufacture, Characterization, Stability, and Regulatory Aspects

Moderator: Ruth Schmid
Session Chairs: Craig Bunt and Nicole Papen-Botterhuis

Invited Speakers

1:20 PM **7**
High-throughput synthesis and characterization of microcapsules
Johan Paul, Flamac, a division of SIM, Belgium

1:45 PM **8**
Characterization of the Mechanical Strength, Adhesion and Leakage of Microcapsules for Developing Consumer Products
Zhibing Zhang, University of Birmingham, United Kingdom

Research Highlight Talks

2:10 PM **226**
A scalable microfluidics platform for the development of lipid nanoparticles
Ray Lockard, Precision NanoSystems, Inc., Canada

2:18 PM **220**
Effect of Manufacturing Process on Critical Quality Attributes of Nlatrexone Microspheres
Janki Andhariya, University of Connecticut, U.S.A.

2:26 PM **235**
Print-Drying: Monodisperse Droplet Spray-Drying & High Quality Powder Production
Joris Salari, TNO, The Netherlands

2:34 PM **215**
Physical Characteristics of Non-Ionic Surfactant Vesicles Prepared Using Different Manufacturing Methods
Mohammad Obeid, University of Strathclyde, United Kingdom

Room 6B

Parenteral Systemic Delivery of Biopharmaceuticals: Overcoming Product Development and Regulatory Challenges

Moderator: Emmanuel Ho
Session Chairs: Stephanie Choi and David Chen

Invited Speakers

1:20 PM **20**
Transforming the State-of-the-Art for Manufacturing Biotherapeutics: Increasing quality and affordability for a global market
Bruce Kerwin, Just Biotherapeutics, U.S.A.

1:45 PM **21**
Challenges with High Concentration Protein Solutions: Viscosity, Delivery of Large Volumes, and Device Considerations
William Lambert, Omeros, U.S.A.

Research Highlight Talks

2:10 PM **486**
PRINT: A protein bioconjugation method with exquisite N-terminal specificity
Surojit Sur, Johns Hopkins Kimmel Cancer Center, U.S.A.

2:18 PM **484**
A Novel Microfabricated Drug Delivery Platform with Pulsatile Release Kinetics
Kevin McHugh, Massachusetts Institute of Technology, U.S.A.

2:26 PM **488**
Chemistry, Manufacturing, and Control Deficiencies in Liposomal Drug Product Submissions
Mamta Kapoor, US Food and Drug Administration, U.S.A.

2:34 PM **475**
Ex-Vivo Intraocular Model to Investigate Long-Term Protein stability in the Vitreous Humor
Sulabh Patel, Pharmaceutical, F. Hoffmann-La Roche Ltd, Switzerland

608–609

Developing Therapeutic Options for Combatting Cancer: A "One Health" Challenge for Humans and Dogs Mini Symposium

Sponsored by

zoetis

Moderator: Marilyn Martinez
Session Chair: David Brayden

The One Health concept is based upon an appreciation of the inextricable link between animal and human health (www.onehealthinitiative.com). This initiative has revitalized the parallel development of therapeutics and delivery systems for the treatment of diseases common to humans and animals. The Preclinical Sciences & Animal Health Division will conclude a One Health year-long initiative in the CRS Newsletter with a mini-symposium with renowned speakers.

Invited Speakers

1:15 PM **9**
Defining the Value of Comparative Oncology: The NCI Comparative Oncology Program and Companion Species Clinical Trials
David Vail, University of Wisconsin-Madison, U.S.A.

2:15 PM
Abstract not available
Thomas Andresen, Technical University of Denmark, Denmark

6A

Improving Complex Oral Development – New Modified Release Technologies and Accelerated Development Programs Industry Roundtable

Sponsored by

Catalent

Join the discussion on solutions across a number of formulation technologies with topics to include oral controlled release capabilities and softgel controlled release capabilities.

Schedule-At-A-Glance

1:15 – 2:45 p.m.	Scientific Sessions Program
1:15 – 2:45 p.m.	Poster Viewing (authors not present)
3:00 – 4:00 p.m.	Exposition and Poster Session – Authors Present
3:00 – 3:30 p.m.	Odd Numbered Poster Authors Present
3:30 – 4:00 p.m.	Even Numbered Poster Authors Present
4:00 – 5:00 p.m.	Research Highlight Talk Sessions – **NEW!**
4:00 – 5:00 p.m.	Preclinical Sciences & Animal Health (PSAH) Division Meeting • Room 606
5:15 – 6:30 p.m.	Exposition and Poster Pub – **NEW!**
8:00 – 9:30 p.m.	Preclinical Sciences & Animal Health Networking Event*

Program Highlights

Preclinical Sciences & Animal Health (PSAH) Mini-Symposium

Developing Therapeutic Options for Combatting Cancer: A "One Health" Challenge for Humans and Dogs
Sponsored by Zoetis, LLC
1:15 – 2:45 p.m. • Room 608–609

Industry Roundtable

Improving Complex Oral Development – New Modified Release Technologies and Accelerated Development Programs
Sponsored by Catalent Pharma Solutions
1:15 – 2:45 p.m. • Room 6A

Small Company Session

Emerging Companies and Technologies
4:00 – 5:00 p.m. • Room 6A

Other Highlighted Events

Poster Pub – NEW!
Sponsored by Akina, Inc: Poly Sci Tech Division
5:15 – 6:30 p.m. • Room 4AB

Awards for the Graduate Research Advances in Delivery Science (GRADS), sponsored by Merck, will be announced during the Poster Pub.

Preclinical Sciences & Animal Health (PSAH) Networking Event*
8:00 – 9:30 p.m. • Kells Irish Pub (offsite)

**Additional registration, payment, and ticket required*

Poster Pub

Sponsored by PolySciTech®

Monday, July 18

Connect with poster presenters on the latest techniques, breakthroughs, and applications in delivery science—All over your favorite drink!

Research Highlight Talk Sessions • Monday 4:00 – 5:00 p.m.

Room 6B
Group A

Includes the following session categories: Physical Oncology, Integration of Imaging and Drug Delivery, and Parenteral Systemic Delivery of Biopharmaceuticals

Session Chair: David Peeler

4:04 PM **483**
Liposomes Reloaded: A novel strategy for loading "unloadable" drugs into stealth liposomes
Surojit Sur, Johns Hopkins Medical Institutions, U.S.A.

4:11 PM **541**
Hyperthermia-induced Triggered Release of Cisplatin from Thermosensitive Liposomes and Changes in Tumor Microenvironment in Non-Small Cell Lung Carcinoma
Yannan Nancy Dou, University of Toronto, Canada

4:18 PM **132**
Investigating tumor cell specificity of a nanoparticle with a surface-converting coating by multimodal imaging
Francois Day, Icahn School of Medicine at Mount Sinai, U.S.A.

4:25 PM **547**
Nano-CaCO3 as a pH sensitive therapeutic platform for modulating the tumor extracellular environment
Avik Som, Washington University in St. Louis, U.S.A.

4:32 PM **118**
In-vitro and In-vivo Uptake of Liposomal Quantum Dots by Phagocytic Cells: Effective Approach for Imaging of Inflammation
Gershon Golomb, The Hebrew University of Jerusalem, Israel

4:39 PM **471**
Binding of Human Serum Albumin to Liposomes Studied by Fluorescence Correlation Spectroscopy
Kasper Kristensen, Technical University of Denmark, Denmark

4:46 PM **477**
Intravenous albumin-based formulation of rifabutin: toxicological evaluation
Nadezhda Osipova, Drugs Technology LLC, Russia

4:53 PM **480**
Effect of Polymer Source on the In Vitro Release Characteristics of In Situ Forming Implants
Min Sung Suh, University of Connecticut, U.S.A.

Room 611–614
Group B

Includes the following session categories: Oral Delivery and Local Drug Delivery

Session Chairs: Daniel Bar-Shalom and Tony Listro

4:04 PM **332**
Development of injection-molded capsular devices for pulsatile and colonic delivery through the application of fused deposition modeling (FDM) 3D printing
Alice Melocchi, Università degli studi di Milano, Italy

4:11 PM **334**
New Approaches on SNEDDS Dosing Regimens: In Vitro and In Vivo Evaluations
Scheyla Siqueira, University of Copenhagen, Denmark

4:18 PM **378**
Controlled suspensions as a method for small scale dissolution of poorly water-soluble compounds
Sara Andersson, Uppsala University, Sweden

4:25 PM **365**
Development and Optimization of PLGA Nanoparticles as a Carrier System for Oral Delivery of Gemcitabine to Treat Breast Cancer
Guanyu Chen, University of Auckland, New Zealand

4:32 PM **364**
DHP107, the first-generation oral paclitaxel delivery system
In-Hyun Lee, Dae Hwa Pharm. Co., South Korea

4:39 PM **152**
Nanocrystal-Polymer Particles: a Novel Approach to Treat Osteoarthritis
Pierre Maudens, University of Geneva, Switzerland

4:46 PM **186**
Therapeutic potential of thermosensitive liposomes for treatment of solid tumors: particle accumulation versus intravascular drug release
Wouter Lokerse, Ludwig Maximilians University, Germany

4:53 PM **170**
A systematic development of liposomes to enhance lymphatic drug targeting
Swapnil Khadke, Aston University, United Kingdom

Room 608–609
Group C

Includes the following session categories: Taking Stock of Progress and Challenges in Drug Delivery and Targeting; "Thinking Outside the Box" Delivery Technologies: Nanocarriers from Nature; and Tissue Engineering

Session Chairs: Gerrit Borchard and Gary Liu

4:04 PM **574**
Cancerous SKOV-3 Exosomes Can Be Detected by Using Specific LXY30 Targeting Peptide
Tatu Rojalin, University of Helsinki, Finland

4:11 PM **581**
CD44-Targeted Calcium Phosphate Nanoparticles for Anticancer Drug Delivery
Min Sung Suh, University of Connecticut, U.S.A.

4:18 PM **582**
Improvement of cellular uptake and antitumor efficacy of liposomal doxorubicin by targeting the CD133 marker
Leila Arabi, Mashhad University of Medical Sciences, Iran

4:25 PM **586**
Endosomal FcRn-dependent Trafficking of Albumin
Maja Thim Larsen, Aarhus University, Denmark

4:32 PM **587**
Long circulating Ferritin Nanocage with 'Protein cloud'
Na Kyeong Lee, Korea Institute of Science and Technology, South Korea

4:39 PM **606**
Injectable Self-assembled Gelatin Cell Constructs for Tissue Engineering
Yi-You Huang, National Taiwan University, Taiwan

4:46 PM **600**
In vitro and In vivo Evaluation of Controlled Payload Release using Acoustically-Responsive Scaffolds
Alexander Moncion Baez, University of Michigan, U.S.A.

4:53 PM **597**
Novel thin heparin-functionalized hydrogel-coatings for controlled VEGF release
Christiane Claassen, University of Stuttgart, Germany

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Capsugel Dosage Form Solutions CRS Industry Roundtable
"Current Trends in Bioavailability Enhancing Technologies"
Wednesday, July 20, 8:00am - 9:30am
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Scientific Program • Tuesday 8:00 – 9:30 a.m.

Room 608–609

"Thinking Outside the Box" Delivery Technologies: Nanocarriers from Nature

Moderator: Claus-Michael Lehr
Session Chairs: Laura Ensign and Alexander Florence

Invited Speaker
8:05 AM **28**
Exosome mimetics-based platform technology for targeted drug delivery and adjuvant-free vaccine
Yong Song Gho, POSTECH, Korea

Research Highlight Talks
8:45 AM **584**
Dendritic cells derived extracellular vesicles for the combinational therapy against tumor
Zhiping Zhang, Huazhong University of Science and Technology, China

8:53 AM **585**
Neutrophil membrane-formed Nanovesicles for Vascular Targeting Delivery
Zhenjia Wang, Washington State University, U.S.A.

9:01 AM **588**
Enzymatic and Anti-Tumorigenic Effect of PH20-Expressing Exosome
Yeonsun Hong, Korea Institute of Science and Technology, Korea

9:09 AM **591**
Fusogenic exosomes as a platform for therapeutic applications
Yoosoo Yang, Korea Institute of Science and Technology, Korea

9:17 AM **590**
Timeresolved fluorescence microscopy imaging of paclitaxel loaded extracellular vesicles in prostate cancer cells
Liisa Niemi, University of Helsinki, Finland

Room 611–614

Tissue Engineering

Moderator: Buddy Ratner
Session Chairs: Hyun Joon Kong and Todd Hoare

Invited Speakers
8:05 AM **29**
The Tissue Engineering-Drug Delivery Intersection
Buddy Ratner, University of Washington, U.S.A.

8:30 AM **30**
Modular Inductive High-Density Cell Culture Systems for Engineering Complex Tissues
Eben Alsberg, Case Western Reserve University, U.S.A.

Research Highlight Talks
8:55 AM **607**
Engineering the Microenvironment of Lymphoid Tissue to Promote Antigen-specific Immune Tolerance
Christopher Jewell, University of Maryland, U.S.A.

9:03 AM **602**
Blebbistatin-Loaded Poly (D,L lactide-co-glycolide) Particles For Treating Arthrofibrosis
Keerthi Atluri, University of Iowa, U.S.A.

9:11 AM **608**
3DCellMakers: Thermogelling Polymers for 3D Cell Culture
Justin Hadar, Akina, Inc., U.S.A.

9:19 AM **598**
A bioabsorbable composite patch for esophageal reconstruction
Rossella Dorati, University of Pavia, Italy

Room 6B

Transdermal Delivery

Moderator: Mark Prausnitz
Session Chair: Samir Mitragotri

Invited Speaker
8:05 AM **31**
Bio-responsive Smart Microneedle Patches
Zhen Gu, University of North Carolina, U.S.A.

Research Highlight Talks
8:45 AM **615**
Carboxylated nanodiamond as a topical drug delivery vehicle: stability and permeation-enhancing effect
Dae Gon Lim, Dongguk University, South Korea

8:53 AM **618**
A novel gel formulation with nanoscale cavitation nucleation agent and OVA for ultrasound-assisted transdermal vaccine delivery and generation of anti-OVA antibodies in mice
Robert Carlisle, University of Oxford, United Kingdom

9:01 AM **617**
Thermoresponsive nanogel mediated protein replacement therapy restores skin-barrier function to full-thickness skin models derived from Transglutaminase 1 deficient patients
Guy Yealland, Free University of Berlin, Germany

9:09 AM **637**
Evaluation of Fractional Laser Ablation for the Controlled Transdermal Delivery of Paliperidone and the Development of a Mathematical Model for Laser-Assisted Drug Transport
Cesar Eulogio Serna Jimenez, University of Geneva, Switzerland

9:17 AM **635**
Bacillus subtilis alkaline protease as a potential biological skin permeation enhancer
Mohamed Nounou, Appalachian College of Pharmacy, U.S.A.

Room 6A

Precision Medicine: Discovery and Development of Advanced Therapy Medicinal Products Industry Roundtable

Sponsored by

Boehringer Ingelheim

Moderator: Keith Horspool

With data collected from individuals on genetic factors, environment and lifestyle, researchers are able to find innovative ways to prevent, treat and monitor disease. Join this discussion to learn how our speakers are revolutionizing the way to improve health on a personal basis.

Invited Speakers:
Pieter Cullis, University of British Columbia, Canada
Peter Senter, Seattle Genetics, U.S.A.

Schedule-at-a-Glance

7:00 – 8:00 a.m.	Finance Committee Meeting • Water Falls Suite, Level 4
7:30 a.m. – 5:00 p.m.	Speaker Preparation Room Open • Room 303
7:30 a.m. – 6:00 p.m.	CRS Registration Open • Atrium Lobby, Level 4
8:00 – 9:30 a.m.	Scientific Program Poster Viewing (authors not present) • Room 4AB
9:30 – 11:15 a.m.	Exposition with coffee break and Poster Sessions
10:15 – 10:45 a.m.	Odd Numbered Poster Authors Present
10:45 – 11:15 a.m.	Even Numbered Poster Authors Present
11:15 a.m. – 12:15 p.m.	Plenary Session • Room 6B

Program Highlights

Industry Roundtable

Precision Medicine: Discovery and Development of Advanced Therapy Medicinal Products
Sponsored by Boehringer Ingelheim Pharmaceuticals, Inc.
8:00 – 9:30 a.m. • Room 6A

Plenary Session

Turning Science to Entrepreneurship: A Journey of Passion
11:15 a.m. – 12:15 p.m. • Room 6B

Jun Keun Chang
CreActive Health Holdings, Korea
Moderator: Kinam Park

Scientific Program • Tuesday 1:30 – 3:00 p.m.

Room 608–609

Delivery Technologies in Nutraceuticals, Food, and Oral Products

Moderator: Yoav Blatt
Session Chairs: Ken Carson and James Oxley

Invited Speaker

1:35 PM **3**
Stabilization of water-in-water emulsions
Robert Tromp, NIZO Food Research, The Netherlands

Research Highlight Talks

2:15 PM **73**
Oxidative Stability Prediction of Microencapsulated Flavor Using an Accelerated Oxidation Test and True Particle Density
Rutger van Sleeuwen, Firmenich, Inc., U.S.A.

2:23 PM **68**
Food Grade Gelatin/Gum Arabic Capsules for In-Dough Extruded Snack/Cereal Applications Anticancer Drug for Colon Targeting
Julie Wieland, International Flavors & Fragrances, U.S.A.

2:31 PM **75**
Taste Masking Strategies Using Ion Exchange Excipients
Amie Gehris, The Dow Chemical Company, U.S.A.

2:39 PM **77**
The Phytochemical Chlorogenic Acid Rescues Oxidative Damage in a Zebrafish Model
Arlene McDowell, University of Otago, New Zealand

2:47 PM **70**
Microencapsulated Diindolylmethane (DIM): Optimizing Formulation Performance and Market Appeal
Irwin Jacobs, Jacobs Controlled Release Consulting, LLC, U.S.A.

Room 6B

Ocular Drug Delivery

Moderator: Kannan Rangaramanujam
Session Chairs: Hong Wen and Yan Wang

Invited Speakers

1:35 PM **11**
Silicon-Based Nanomaterials for Ocular Drug Delivery
Michael Sailor, University of California, San Diego, U.S.A.

2:00 PM **12**
Bridging Product Design and Performance for Bioequivalence: A Journey through the Eye
Xiaoming Xu, FDA, U.S.A.

2:25 PM **13**
An Update on FDA's Research Program for Ophthalmic Generic Products
Stephanie Choi, FDA, U.S.A.

Research Highlight Talks

2:50 PM **274**
Retinylamine Modified Multifunctional Lipid DNA Delivery System for the Treatment of LCA2
Da Sun, Case Western Reserve University, U.S.A.

2:58 PM **269**
Smart Wireless Contact Lens for Ocular Theranosis
Dohee Keum, POSTECH, Korea

Room 611–614

Physical Oncology: Modulating Tumor Microenvironment for Drug Delivery

Moderator: Hamid Ghandehari
Session Chairs: In-San Kim and Tatiana Bronich

Invited Speakers

1:35 PM **23**
Enhancing Blood Perfusion in Tumor Tissue by preventing Tumor associated Thrombosis using oral Heparin to improve the Distribution of Anti-cancer drugs
Youngro Byun, Seoul National University, Korea

Research Highlight Talks

2:15 PM **538**
Enhancement of EPR effect in nanomedicine with nitric oxide-releasing liposome
Yoshiki Katayama, Kyushu University, Japan

2:23 PM **542**
Role of Cancer-Associated Fibroblasts on Drug Response of Pancreatic Cancer Using Tumor-Microenvironment-on-Chip
Bumsoo Han, Purdue University, U.S.A.

2:31 PM **544**
Junction opener protein increases nanoparticle accumulation in solid tumors in a size-dependent manner
Christine Wang, University of Washington, U.S.A.

2:39 PM **533**
High Intensity Focused Ultrasound Hyperthermia for Enhanced Macromolecular Delivery
Nick Frazier, University of Utah, U.S.A.

2:47 PM **540**
Designed protein therapeutics for enhancing anti-tumor immune response
Eun Jung Lee, Korea Institute of Science and Technology, South Korea

Tuesday, July 19 – Afternoon

Schedule-at-a-Glance

12:15 – 1:30 p.m.	*Journal of Controlled Release* Editorial Board Meeting • Room 306
12:30 – 1:30 p.m.	C&DP Luncheon* • Room 602–604
1:30 – 3:00 p.m.	Scientific Program
3:00 – 4:15 p.m.	Exposition and Poster Sessions
3:15 – 3:45 p.m.	Even Numbered Poster Authors Present
3:45 – 4:15 p.m.	Odd Numbered Poster Authors Present
4:15 – 5:15 p.m.	2017 CRS Annual Meeting Program Committee Meeting • Room 306
4:15 – 7:00 p.m.	Exposition Take-Down
4:30 – 5:00 p.m.	CRS Award Lecture • Room 608-609
4:30 – 5:30 p.m.	Research Highlight Talk Sessions - **NEW!**
5:30 – 7:00 p.m.	Women in Science Networking Event* • Room 6A
7:30 – 10:00 p.m.	Beyond the Science: A Night Out!

Program Highlights

Industry Roundtable

Challenges and Opportunities: Subcutaneous Delivery of High Volume/High Viscosity Biologic Formulations from Combination Devices
Sponsored by MERCK
1:30 – 3:00 p.m. • Room 6A

Young Investigator Award Lecture

Hydrogel-forming Microneedles for Drug Delivery and Patient Monitoring
4:30 – 5:30 p.m. • Room 608–609

CRS T. Nagai Postdoctoral Research Achievement Award Lecture

Bio-inspired Materials and Carriers for Small RNA Delivery
4:30 – 5:30 p.m. • Room 608–609

Women in Science Networking Event*

My Academic Journey: Lessons Learned
5:30 – 7:00 p.m. • Room 6A
Speaker: Helen Burt, University of British Columbia, Canada

Beyond the Science: A Night Out!

7:30 – 10:00 p.m. • Pike Place Market/Pikes Brewing Co. (offsite)

**Additional registration, payment, and ticket required*

Room 6A

Challenges and Opportunities: Subcutaneous Delivery of High Volume/High Viscosity Biologic Formulations from Combination Devices Industry Roundtable

Sponsored by

MERCK

Moderator: Philip Green

Over the last few years there has been a dramatic increase in the market for monoclonal antibody drugs. These drugs are typically administered intravenously in hospital or office settings. For certain chronic diseases that require frequent injection over prolonged periods, there is a growing interest in subcutaneous delivery to enhance the convenience for a healthcare professional or to facilitate self-administration by patients at home. A major challenge is that the high doses required can result in large liquid volumes (>1.5 mL) or viscous formulations that are typically difficult to administer in a single injection.

A number of leading biopharmaceutical thought leaders have been assembled to outline the opportunities and challenges in this area. The panelists will discuss recent data and outline various device strategies that are being explored in this exciting new area.

Invited Speakers
Shawn Davis, Amgen
Justin Wright, Eli Lilly and Company
J. Anand Subramony, MedImmune

Research Highlight Talk Sessions • Tuesday 4:30 – 5:30 p.m.

Room 6B

Group D

Includes the following session categories: Delivery Technologies in Cosmetics, Personal Care, and Household Products; Delivery Technologies in Nutraceuticals, Food, and Oral Products; Encapsulation and Controlled Release for Industrial Applications; and Manufacture, Characterization, Stability, and Regulatory Aspects

Session Chair: Richard Korsmeyer

4:34 PM **217**
New Single Microparticle Technique for Forming and Characterizing Polymer Microsphere-Drug Encapsulation and Dissolution: Initial Tests for Ibuprofen-PLGA-DCM
Koji Kinoshita, University of Southern Denmark, Denmark

4:41 PM **225**
Jet dispensing as a high throughput method for rapid screening and manufacturing of cocrystals
Dennis Douroumis, University of Greenwich, United Kingdom

4:48 PM **253**
ElectroNanospray™: Realizing the Benefits of Being Nano-Sized and Amorphous
Christian Wertz, Nanocopoeia, U.S.A.

4:55 PM **263**
Functional Polymers for Drug Delivery Applications
Gangadhar Panambur, MilliporeSigma, U.S.A.

5:02 PM **59**
Coffee silverskin and hyaluronic acid as anti-wrinkles ingredients: An in vivo comparison study
Francisca Rodrigues, Inovapotek, Portugal

5:09 PM **69**
A Simple and Improved Active Loading Method to Efficiently Encapsulate Staurosporine into Lipid-Based Nanoparticles for Enhanced Therapy of Multidrug Resistant Cancer
Wei-Lun Tang, University of British Columbia, Canada

5:16 PM **98**
Prediction of Dissolution-Diffusion Controlled Drug Release from Coated Multi-particulate Dosage Forms with Consideration of Interfacial Drug Partition between Layers
Xiao Yu Wu, University of Toronto, Canada

5:23 PM **101**
Injectable Hydrogel from Synthetic Cyclic Vinyl Polymers for Cell Therapy
Tianyu Zhao, University of Washington, U.S.A.

Room 611–614

Group E

Includes the following session categories: Comparative Pharmacokinetics in Preclinical Sciences; Ocular Drug Delivery; and Preclinical Science Challenges to Drug Delivery

Session Chairs: Laura Ensign and Todd Hoare

4:34 PM **277**
OpsiSporin -Development of Controlled Release Cyclosporin for the treatment of posterior uveitis
Katherine Bamsey, Midatech Pharma, United Kingdom

4:41 PM **271**
Ultrasound-responsive nanobubbles for enhanced posterior eye delivery of therapeutics
Sachin Thakur, University of Queensland, Australia

4:48 PM **278**
Dextran Sulfate Wafer as an Anti-Angiogenic Polymer Therapeutic
Crystal Shin, Baylor College of Medicine, U.S.A.

4:55 PM **281**
Controlled Release of Avastin® from the Tethadur™ Biodegradable Matrix
Catherine Kelly, PsiMedica, United Kingdom

5:02 PM **53**
A phospholipid-based phase separation gel for the prolonged delivery of octreotide
Yao Fu, Sichuan University, China

5:09 PM **57**
Wet-milled nanoparticulate suspensions (Wnano) of compound A formulated in subcutaneous pumps for in vivo sustained release in preclinical studies
Tao Zhang, Pfizer Inc., U.S.A.

5:16 PM **131**
Effect of Phospholipase A2 Receptor (PLA2R) Expression on Tumorgenesis and Performance of Lipid-Nanomedicines in Prostate Cancer
Robert Arnold, Auburn University, U.S.A.

5:23 PM **551**
In vitro-ex vivo correlations between a novel cell-laden hydrogel and mucosal tissue for screening composite delivery systems
Anna Blakney, University of Washington, U.S.A

Room 606–607

Group F

Includes the following session categories: Oligonucleotide Delivery: New Applications and Opportunities; Peptides, Proteins, and Vaccines; and Overcoming Biological Barriers in Drug Delivery

Session Chairs: Anthony Kim and Jung-Soo Suk

4:34 PM **292**
Investigating the Interior of Lipid Nanoparticles for mRNA Delivery by Surface Enhanced DNP-NMR
Staffan Schantz, AstraZeneca R&D Mölndal, Sweden

4:41 PM **495**
Affinity improvement of interleukin-4 receptor binding peptides using NeutrAvidin/biotin complexes and its effect on signaling and survival of tumor cells
Cheong-wun Kim, Kyungpook National University, South Korea

4:48 PM **493**
Selection of triple negative breast cancer cell-binding peptides using phage display
Yun-ki Lee, Kyungpook National University, South Korea

4:55 PM **509**
Formulation and characterization of a hexagonal liquid crystalline drug delivery system
Ellina Mun, Purdue University, U.S.A.

5:02 PM **442**
Hydrophobized Microgels for the Delivery of Antipsychotic Drugs to the Brain
Madeline Simpson, McMaster University, Canada

5:09 PM **415**
Smart Design of Antibody Therapeutics for Treatment of Rheumatoid Arthritis
Sei Kwang Hahn, POSTECH, Korea

5:16 PM **430**
Non-specific Binding and Steric Hindrance Thresholds for Penetration of Nanoparticles in Tumor Tissue
Jimena Perez Bermudez, University of Maryland Baltimore, U.S.A.

5:23 PM **407**
Polymer Architecture and Chain Length Influence Macrophage Response to Micelles
Richard Gemeinhart, University of Illinois, U.S.A.

Room 608–609

Group G

Features: Award lectures from the CRS T. Nagai Postdoctoral Research Achievement and the Young Investigator awardees, and session categories: Preclinical Science Challenges to Drug Delivery; Transdermal Delivery.

Session Chairs: Charlie Martin and Ron Siegel

4:35 PM **32**
Young Investigator Award Lecture: Hydrogel-forming Microneedles for Drug Delivery and Patient Monitoring
Ryan Donnelly, Queen's University Belfast, United Kingdom

4:47 PM **19**
CRS T. Nagai Award Lecture: Bio-inspired Materials and Carriers for Small RNA Delivery
Koen Raemdonck, Ghent University, Belgium

4:59 PM **623**
Biolistic Delivery of pDNA-coated Particles with a MEMS Device Shows SEAP Expression in Mice
Fatemeh Nazly Pirmoradi, Palo Alto Research Center Inc. (PARC), U.S.A.

5:06 PM **624**
Nicotine delivery rates from programmable carbon nanotube membrane-based transdermal delivery device as determined by microdialysis method
Gaurav Kumar Gulati, University of Washington, U.S.A.

5:13 PM **554**
Cisplatin-conjugated gold nanoparticles for improved radiotherapeutic effects in in vitro models of triple negative breast cancer
Sohyoung Her, University of Toronto, Canada

5:20 PM **636**
Controlled Anodal Iontophoretic Delivery of Biolabile Hydrosoluble Raloxifen Prodrugs
César Serna, University of Geneva, Switzerland

Scientific Program • Wednesday 8:00 – 9:30 a.m.

Room 611–614

Local Drug Delivery

Sponsored by

Catalent

Moderator: Justin Hanes
Session Chairs: Richard Gemeinhart and Farid Dorkoosh

Invited Speaker
8:05 AM **6**
Local image-guided drug delivery across the Blood-Brain barrier (BBB) using focused ultrasound
Kullervo Hynynen, University of Toronto, Canada

Research Highlight Talks
8:45 AM **189**
Temperature sensitive liposomal doxorubicin combined with tumor ablation: effect of heating duration and administration schedule
Dieter Haemmerich, Medical University of South Carolina, U.S.A.

8:53 AM **191**
Formulation of Stimuli-Sensitive Thiolated Hyaluronic Acid Based Nanofibers: Synthesis, Characterization, Preclinical Safety and In Vitro anti-HIV Activity
Vivek Agrahari, University of Missouri-Kansas City, U.S.A.

9:01 AM **199**
Convection-enhanced delivery of radiosensitizing-nanoparticles for the treatment of intracranial glioma
Amanda King, Yale University, U.S.A.

9:09 AM **148**
Pharmacokinetics and preventive effects of platinum nanoparticles as reactive oxygen species scavengers on peritoneal dissemination of tumor cells
Hidemasa Katsumi, Kyoto Pharmaceutical University, Japan

9:17 AM **196**
Mounting Evidence of Pulmonary Nanoparticles as an Effective Lymphatic Targeting Delivery System
Joshua Reineke, South Dakota State University, U.S.A.

Room 608–609

New Processes, New Materials, New Products

Moderator: Ryan Donnelly
Session Chairs: Elias Fattal and Heidi Mansour

Invited Speaker
8:05 AM **10**
Abstract not available
Khuloud Al-Jamal, King's College London, United Kingdom

Research Highlight Talks
8:45 AM **243**
Nitric Oxide: A key player for novel anti-cancer immunotherapeutics
Yukio Nagasaki, University of Tsukuba, Japan

8:53 AM **248**
Transformable Liquid-Metal Nanomedicine
Yue Lu, University of North Carolina at Chapel Hill and North Carolina State University, U.S.A.

9:01 AM **240**
Three-dimensional micro-patterning of biodegradable polymers for controlled drug delivery
Thanh Nguyen, University of Connecticut, U.S.A.

9:09 AM **242**
Tumor acidity sensitive polymeric micelle for selective cellular uptake of doxorubicin
Yuki Hiruta, Keio University, Japan

9:17 AM **247**
Coupling 3D Printing with Hot Melt Extrusion Technology to Continuously Produce Controlled Release Tablets
Roshan Tiwari, University of Mississippi, U.S.A.

Room 6B

mRNA Delivery and Clinical Translation for Vaccines and Therapeutics Mini Symposium

Moderator: Gerald Zon
Chair: Mark Tracy

Over the last couple of years, mRNAs have emerged as a new class of nucleic acid molecules with great promise as therapeutics and vaccines. Potent, safe intracellular delivery of these large RNAs is a key to enabling these molecules as drugs and vaccines. There are some common aspects of delivery between oligonucleotides (e.g., siRNAs) and mRNAs but important differences too. This mini-symposium focuses on mRNA itself, the challenges in delivering mRNA, and current progress in developing delivery systems for mRNA with an emphasis on the potential for clinical translation for vaccines and therapeutics.

Invited Speakers
8:05 AM
Katalin Karikó, BioNTech AG

8:25 AM
Patrick Baumhof, CureVac GmbH

8:45 AM
Thomas Madden, Acuitas Therapeutics

9:05 AM
Panel Discussion

Room 606–607

Clinical Advances in Cancer Nanomedicines Industry Roundtable

Sponsored by

Celator Pharmaceuticals

Moderator: Mark Davis

Despite significant technical advances in drug delivery systems over the past three decades, finding clinical applications where cancer nanomedicines can make a transformative impact on treatment practice has remained elusive. However, we are now seeing evidence of marked improvements in cancer patient outcomes for both liposome- and nanoparticle-based nanomedicines, particularly when applied in a setting of combination therapy. This session will review the challenges historically facing the development of high-impact cancer nanomedicines and provide recent examples where significant improvements in patient outcomes have been achieved in late-stage clinical trials.

Invited Speakers

8:00 AM
Mark Davis, California Institute of Technology

8:30 AM
Scott Eliasof, Cerulean Pharma Inc.

9:00 AM **33**
VYXEOS™ (CPX-351) significantly improves overall survival in phase 3 high-risk AML trial, validating the CombiPlex technology and opening opportunities for novel combinations
Lawrence Mayer, Celator Pharmaceuticals, Inc.

Room 6A

Current Trends in Bioavailability Enhancing Technologies Industry Roundtable

Sponsored by

CAPSUGEL® Dosage Form Solutions

Moderator: David Lyon

More than 60% of the compounds in pharmaceutical pipelines today are considered to be poorly bioavailable due to slow dissolution rate or poor solubility. This has led to a need for using increasingly sophisticated delivery technologies. These technologies range from particle size reduction technology aimed at increasing dissolution rates to amorphous dispersions and lipid delivery technologies.

Expert panel members will participate from the pharmaceutical, contract research, market intelligence industries and academia. During this roundtable, we will share viewpoints on bioavailability enhancing technologies and how to rationally choose the best technology.

Invited Speakers

Patrick Marsac, University of Kentucky
Derek Hennecke, Xcelience, LLC
Colin Pouton, Monash University
David Vodak, Bend Research/Capsugel
Jon Miller, Vertex Pharmaceuticals
Jon Morris, AbbVie

Schedule-at-a-Glance

7:00 – 8:00 a.m.
CRS Board of Scientific Advisors Meeting • Room 302

7:30 a.m. – 3:00 p.m.
CRS Registration Open • Atrium Lobby, Level 4

8:00 – 9:30 a.m.
Scientific Program

8:00 – 10:00 a.m.
CRS Board of Directors Meeting • Water Fall Suite, Level 4

9:45 – 11:15 a.m.
Scientific Program

11:15 a.m. – 12:15 p.m.
Consumer and Diversified Products (C&DP) Division Meeting • Room 302

Program Highlights

Mini-Symposium

mRNA Delivery and Clinical Translation for Vaccines and Therapeutics
8:00 – 9:30 a.m. • Room 6B

Industry Roundtables

Current Trends in Bioavailability Enhancing Technologies
Sponsored by Capsugel Dosage Form Solutions
8:00 – 9:30 a.m. • Room 6A

Clinical Advances in Cancer Nanomedicines
Sponsored by Celator Pharmaceuticals, Inc.
8:00 – 9:30 a.m. • Room 606–607

Consumer Connected Delivery
Supported by mProve and the Consumer & Diversified Products Division of CRS
9:45 – 11:15 a.m. • Room 6A

Room 608–609

Comparative Pharmacokinetics in Preclinical Sciences

Moderator: Marilyn Martinez
Session Chairs: Thierry Vandamme and Praveen Hiremath

Invited Speaker
9:50 AM **1**
Considerations in the Use of the Beagle Dog as a Preclinical Species in Assessing Bioperformance and Oral Sustained Release Technology Development
Paul Walsh, Merck and Co., Inc., U.S.A.

Research Highlight Talks
10:30 AM **50**
Design and Validation of an Intraocular In Vitro Simulator
Joanna Wang, University of California at San Diego, U.S.A.

10:38 AM **56**
Bioavailability and pharmacokinetics of zidovudine mucoadhesive polymeric nanoparticles in rats
Liliane Pedreiro, University of São Paulo, Brazil

10:45 AM **51**
Pharmacokinetic-pharmacodynamic analyses of nifedipine and propranolol in rats to investigate characteristics of effect and side effects - applications to controlled release
Akiko Kiriyama, Doshisha Women's College of Liberal Arts, Japan

10:53 AM **52**
Biodistribution of GDC-0449 Loaded Micelles in Liver Fibrotic Mice
Rinku Dutta, University of Nebraska Medical Center, U.S.A.

11:00 AM **54**
Development of in-vivo Method for Intranasal Delivery of Powder or Solution Formulation
Gopinadh Bhyrapuneni, Suven Life Sciences Limited, India

Room 611–614

Encapsulation and Controlled Release for Industrial Applications

Moderator: Jie Shen
Session Chairs: Teresa Virgallito and Yabin Lei

Invited Speaker
9:50 AM **4**
Multifunctional microcapsules for active anticorrosion and antifouling applications
Jinglei Yang, Hong Kong University of Science and Technology, China

Research Highlight Talks
10:30 AM **87**
Controlled release of microencapsulated active from coatings: Polyelectrolyte shells as globally rate-determining barriers
Jonatan Bergek, Chalmers University of Technology, Sweden

10:38 AM **97**
Parylene Coated Chemicals for Downhole Treatments
Ronald Versic, Ronald T. Dodge Company, U.S.A.

10:45 AM **89**
Flame Retardant Encapsulation for Preparation of Nanofoams
Liang Chen, The Dow Chemical Company, U.S.A.

10:53 AM **91**
Interfacial Microencapsulation Fundamentals: Re-visiting Select Historical Patents
James Essinger, Gowan Company, U.S.A.

11:00 AM **96**
Novel contrast agents for Targeted Biomedical Imaging
Thierry Vandamme, University of Strasbourg, France

Room 6B

Overcoming Biological Barriers in Drug Delivery

Moderator: Anand Subramony
Session Chairs: Yizhou Dong and Suzie Pun

Invited Speaker
9:50 AM **18**
Mechanisms for Improving Drug Delivery in Pancreatic Cancer
Murray Korc, Indiana University, U.S.A.

Research Highlight Talks
10:30 AM **441**
Cellular tropism of intracranially delivered brain-penetrating nanoparticles
Alice Gaudin, Yale University, U.S.A.

10:38 AM **399**
Microbubble-Enhanced Ultrasound for Non-viral Gene Delivery to the Brain
James-Kevin Tan, University of Washington, U.S.A.

10:45 AM **438**
Tuning the Mechanical Stiffness of Discoidal Polymeric Nanoconstructs inhibits macrophage uptake and enhances tumor accumulation
Anna Lisa Palange, Italian Institute of Technology, Italy

10:53 AM **460**
Lipid-like Nanoparticles for mRNA Delivery in vivo
Yizhou Dong, The Ohio State University, U.S.A.

11:00 AM **402**
Geometry optimized t-micelles: a trojan horse for enhanced brain delivery
Preshita Desai, Institute of Chemical Technology, India

Room 606–607

Taking Stock of Progress and Challenges in Drug Delivery and Targeting

Moderator: David Stepensky
Session Chairs: Wim Hennink and Ian Tucker

Invited Speaker

9:50 AM **27**
Correlative, Causative, Curable and Credible: Reliability, Truth and Accuracy in Research Reporting
David Grainger, University of Utah, U.S.A.

Research Highlight Talks

10:30 AM **583**
What are the most important controlled release products of all time?
Ian Tucker, University of Otago, New Zealand

10:38 AM **573**
Pharmacokinetic and Tumour distribution properties of doxorubicin conjugated PEGylated dendrimers
Dharmini Mehta, Monash Institute of Pharmaceutical Sciences, Monash University, Australia

10:46 AM **578**
The next generation active delivery strategies exploring non-competitive ligands to the receptor
Raghu Ganugula, Texas A&M Health Science Center, U.S.A.

10:54 AM **567**
Development of PEGylated carboxylic acid modified polyamidoamine dendrimer as a bone targeting carrier for the treatment of bone diseases
Shugo Yamashita, Kyoto Pharmaceutical University, Japan

11:02 AM **568**
Incorporation of taxol binding peptide enhances drug loading in polymeric micelles
Jennifer Logie, University of Toronto, Canada

6A

Consumer Connected Delivery Industry Roundtable

Sponsored by the CRS Consumer & Diversified Products Division

Moderators: Christopher McDaniel and James Oxley

Controlled release is expanding beyond the classic materials and related sciences that dominate our literature and meetings. With the proliferation of a connected society and greater access to data, the divide between personal health and healthcare is disappearing. Consumers are gaining more control over their choices and the technology used to improve their health. From smart patches and pills to apps and information technology, modern day consumer electronics are facilitating the connection between drug delivery, diagnostics, care management, and the consumer. This symposium brings together leaders in the area of connected delivery devices to present and discuss their solutions and vision for enabling consumer-controlled healthcare.

Invited Speakers

9:45 AM
The Future of Personalized Drug Delivery
Alan Levy, Chrono Therapeutics

10:05 AM
Healthcare Uses of Wearable Sensors
Russell Potts, Russ Potts Consulting, LLC

10:25 AM
Smart Pharmaceuticals for the Precision Medicine Era
Jeff Zhimizu, Medimetrics

10:45 AM
Connected Sensing: Challenges and Opportunities
Janet Tamada, J. Tamada Consulting

11:05 AM
Panel Discussion

Schedule-at-a-Glance

12:30 – 2:00 p.m. Scientific Program
2:00 – 3:00 p.m. Plenary Session • Room 6B

Program Highlights

Plenary Session

Outgoing CRS Board members will be recognized at the start of the session.

Hyperbranched Polyglycerol-Based Nanoparticles for Treatment of Superficial Bladder Cancer: Preclinical Research and Development
2:00 p.m. – 3:00 p.m. • Room 6B

Helen Burt
University of British Columbia, Canada
Moderator: Christine Allen

Scientific Program • Wednesday 12:30 – 2:00 p.m.

Room 611–614

Oligonucleotide Delivery: New Applications and Opportunities

Moderator: Pieter Cullis
Session Chairs: Gaurav Sahay and Ken Howard

Invited Speakers

12:35 PM **14**
Engineering Cyclodextrin Nanoparticles for the Delivery of siRNA
Andrew Geall, Avidity NanoMedicines, U.S.A.

1:00 PM **15**
Design of lipid nanoparticle delivery systems to enable therapeutic applications of siRNA and mRNA
Pieter Cullis, University of British Columbia, Canada

Research Highlight Talks

1:25 PM **307**
Antisense oligonucleotide delivery using complementary DNA nanostructures
Yu-Kyoung Oh, Seoul National University, South Korea

1:33 PM **300**
Biodegradable Dendritic Lipid Nanoparticles for Small RNA Delivery to Treat Gynecologic Cancers
Petra Kos, UT Southwestern Medical Center, U.S.A.

1:41 PM **291**
Improving RNAi-mediated Gene Silencing of Chemically Modified siRNA-GalNAc Conjugate Using Phosphate Mimic
Rubina Parmar, Alnylam Pharmaceuticals, U.S.A.

1:49 PM **301**
Combinatorial mTORC2 RNAi and lapatanib for treatment of HER2-amplified breast cancer
Craig Duvall, Vanderbilt University, U.S.A.

Room 6B

Peptides, Proteins, and Vaccines

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Moderator: Steven Schwendeman
Session Chairs: Patrick Baumhof and Yoon Yeo

Invited Speaker

12:35 PM **22**
Formulating to optimize peptide chemical and physical stability
Elizabeth Topp, Purdue University, U.S.A.

Research Highlight Talks

1:15 PM **523**
Investigating the Immunomodulatory Function of Carrier-Free Vaccine Capsules
Christopher Jewell, University of Maryland - College Park, U.S.A.

1:23 PM **520**
Varying Peptide Valency for Optimization of PolySTAT, a Synthetic Fibrin-Crosslinking Polymer
Robert Lamm, University of Washington, U.S.A.

1:31 PM **505**
A Novel Immunotherapeutic Approach for Cancer by Foreignizing Tumor Cells Using a Polymeric Conjugate
Jung Min Shin, Sungkyunkwan University, South Korea

1:39 PM **514**
Self-assembling Peptide Epitopes for Tumor Vaccination
Enrico Mastrobattista, Utrecht Institute for Pharmaceutical Sciences, The Netherlands

1:47 PM **510**
Transnasal delivery of peptide agonist specific to neuromedin U receptor 2 to the brain for the treatment of obesity
Akiko Tanaka, Kyoto Pharmaceutical University, Japan

Room 608–609

Preclinical Science Challenges to Drug Delivery

Moderator: David Brayden
Session Chair: Marianne Ashford

Invited Speakers

12:35 PM **24**
Comparative aspects of drug transporters in companion animals: Implications for drug delivery
Katrina Mealey, Washington State University, U.S.A.

1:00 PM **25**
Organs-on-Chips: a Living Platform for Generating Human Relevant Data
S. Jordan Kerns, Emulate, Inc. U.S.A.

Research Highlight Talks

1:25 PM **550**
A Drug Selection Approach for Targeted Inhibition of Atherosclerotic Plaque Inflammation
Amr Alaarg, Translational and Molecular Imaging Institute, U.S.A.

1:33 PM **557**
Two types of systemic lymphatic uptake of macromolecules
Mikhail (Misha) Papisov, Massachusetts General Hospital & Harvard Medical School, U.S.A.

1:41 PM **552**
The Combination of BIBF 1120 (BIBF) and Paclitaxel (PTX) Independently Loaded in PLGA Nanoparticles as a Treatment for Endometrial Cancer (EC)
Anh-vu Do, University of Iowa, U.S.A.

1:49 PM **553**
High Capacity GCPQ Polymer Nanoemulsion Allows Efficient Delivery of Disulfiram for Cancer Therapy
Erazuliana Abd Kadir, University College London, United Kingdom

Room 6A

Predictive Modeling in Delivery and Targeting (Scaling: Mouse to Man; Probability of Reaching Targets; Stochastic Process in System Distribution)

Moderator: Ping Lee
Session Chair: Joshua Reineke

Invited Speaker

12:35 PM **26**
Consideration of Dynamic Factors for Cancer Models and Modeling
You Han Bae, University of Utah, U.S.A.

Research Highlight Talks

1:15 PM **565**
Gaussian Processes: Towards better modelling of drug-loading in solid lipid nanoparticles
Rania Hathout, Ain Shams University, Egypt

1:23 PM **385**
PBPK modelling applied to a weak acid drug formulated as a gastro-resistant (GR) tablet
Teófilo Vasconcelos, BIAL, Portugal

1:31 PM **564**
Evaluation of in vitro tests to reduce animal testing in drug toxicology studies
Jon Mole, Sirius Analytical Inc., U.S.A.

1:39 PM **563**
Multi-scale Modeling of Drug Release through Polymer Hydrogels
Aditya Pareek, TRDDC-TCS Innovation Labs, India

1:47 PM **566**
Targeting and altering *in vivo* macrophage responses with modified polymer properties
Kaitlin Bratlie, Iowa State University, U.S.A.

Connect @ the Expo

Exposition Hall (Room 4 AB, Level 4)

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.

2016 Exhibitors *(as of June 16, 2016)*

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

712 3M Drug Delivery Systems, USA
707 Absorption Systems, USA
704 Adhesives Research/ARx, LLC, USA
208 Advanced Polymer Materials Inc., Canada
105 Agilent Technologies, USA
506 Akina, Inc.: PolySciTech Division, USA*
TT American Pharmaceutical Review, USA*
207 Anton Paar, USA
610 Ashland Inc., USA
406 Avanti Polar Lipids, Inc., USA
504 Capsugel Dosage Form Solutions, USA*
412 Catalent Pharma Solutions, USA*
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306 FlackTek, Inc., USA
308 Freund-Vector Corporation, USA
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405 Gattefossé, USA
509 Gaylord Chemical Company, USA
312 Hanson Research Corporation, USA
606 IMA North America, Inc., USA
605 InSitu Biologics, USA*
210 ISPG, Inc., USA
508 LCI Corporation, USA
505 Lipoid, LLC, USA
608 Logan Instruments Corp., USA
701 LTS Lohmann Therapy Systems, USA
305 Malvern Instruments, USA*
309 MedPharm, United Kingdom
613 Microfluidics International Corporation, USA
709 Mikron Automation, USA
411 MilliporeSigma, USA
510 NanoImaging Services, Inc., USA
611 NOF Corporation, Japan
213 Oakwood Labs, USA
102 O'Hara Technologies Inc., Canada
705 Pantec Biosolutions AG, Liechtenstein
205 Patheon, USA
TT Pharmaceutical Technology, USA*
113 PharmaCircle, USA
304 PolyMicrospheres - Advanced Nanotech, USA
507 Polymun Scientific Immunbiologische Forschung GmbH, Austria
513 Precision NanoSystems Inc., Canada*
209 ProMed Pharma, USA
107 Quotient Clinical, United Kingdom
310 Shin-Etsu Chemical Co., USA
204 Simcyp (a Certara Company), United Kingdom
307 Simulations Plus, Inc., USA
211 Sirius Analytical, Inc., USA
407 SOTAX, USA
410 Southwest Research Institute, USA
612 Spraybase, Ireland
104 Springer, USA*
311 Suven Life Sciences Limited, India
703 Taylor & Francis Group, United Kingdom
511 Texture Technologies Corp., USA
604 TRANSFERRA Nanosciences Inc., Canada*
408 Wyatt Technology Corporation, USA

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2016 CRS Awards & Recognition

Congratulations to the 2016 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 17, 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.

Ian Tucker
University of Otago, New Zealand

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.

Elias Fattal
University of Paris Sud, France

Marilyn Martinez
FDA Center for Veterinary Medicine, U.S.A.

Vinod Labhasetwar
Cleveland Clinic, U.S.A.

Steven Schwendeman
University of Michigan, U.S.A.

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.

Hans E. Junginger
Leiden University, Germany

CRS T. Nagai Postdoctoral Research Achievement Award

Cosponsored by The Nagai Foundation Tokyo

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.

Koen Raemdonck
Ghent University, Belgium

Stefaan C. De Smedt
Ghent University, Belgium

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.

Ryan Donnelly
Queen's University Belfast, United Kingdom

2016 CRS Awards & Recognition

Jorge Heller *Journal of Controlled Release* Outstanding Paper Award

Cosponsored by Elsevier

This award recognizes an outstanding regular paper related to the science of controlled release (not an invited, review, or special meeting paper) that was published during 2015 in the Journal of Controlled Release.

Robert Carlisle
University of Oxford, United Kingdom

Increasing the density of nanomedicines improves their ultrasound-mediated delivery to tumours. J. Controlled Release 210: 10–18 (2015).

Drug Delivery and Translational Research Outstanding Paper Award

Cosponsored by Springer

This award recognizes outstanding research in the field of drug delivery and translational research that was published during 2015 in Drug Delivery and Translational Research.

Andrés J. García
Georgia Institute of Technology, U.S.A.

Engineered VEGF-releasing PEG–MAL hydrogel for pancreatic islet vascularization. Drug. Deliv. Transl. Res. 5: 125–136 (2015)

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