



Write your name here:

35th Asilomar Conference on Mass Spectrometry

MASS SPECTROMETRY IMAGING: NEW DEVELOPMENTS AND APPLICATIONS

Friday, October 11 - Tuesday, October 15, 2019
Asilomar Conference Center, Pacific Grove, CA

Organizers

Julia Laskin, *Purdue University*

Lingjun Li, *University of Wisconsin-Madison*

Jeffrey Spraggins, *Vanderbilt University*

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ASMS Asilomar Committee

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Genentech

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Columbia University

Vicki Wysocki, Board Representative
The Ohio State University

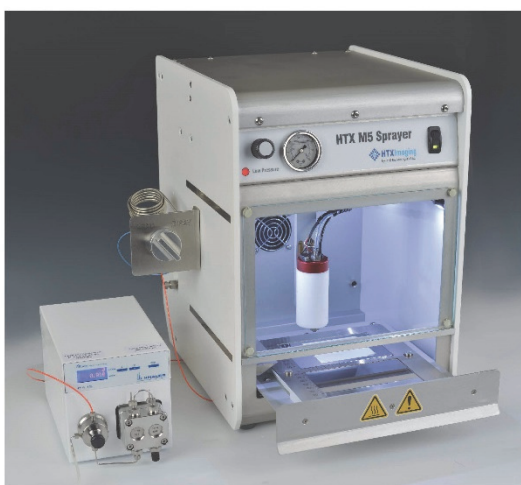
Wendy Zhong
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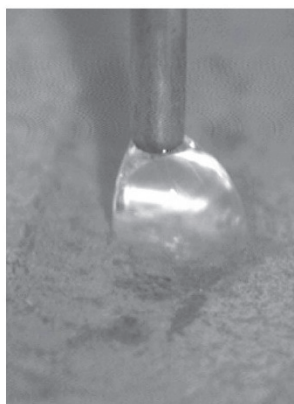
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To request further information contact:

Alain Creissen and Sloane Tilley

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HTX Technologies offers innovative sample preparation systems for advanced analytical platforms. Our integrated workflow solutions include user training, instruments, software, consumables and method development services.

 **HTX Imaging**
by HTX Technologies, LLC

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GENERAL INFORMATION

INTERNET ACCESS

There is complimentary wi-fi access in the session room (Chapel), guest rooms and the Social Hall (main building).

To use the wi-fi in Chapel (session room), please follow these instructions:

- Connect to the Asilomar Conference Network
- Passphrase is the word "conference" (lowercase)
- Once connected, open your web browser.
- You should see Asilomar Conf. Grounds login page.
- Scroll to the bottom of the page and use the Username and Password below:
Username: conf8690
Password: conf8690

MEALS AT ASILOMAR

For attendees lodging at Asilomar you will receive meal tickets for all meals beginning with dinner on Friday and ending with lunch on Tuesday. A vegetarian option is always available upon request at the meal line. *For Tuesday a box lunch has been requested for you, please use your remaining lunch ticket to pick up your box lunch on Tuesday morning, 7:30-9:00 am in Crocker Dining Hall.*

For attendees staying offsite you will have (3) lunch tickets and (3) dinner tickets. If for some reason you did not pay the offsite fee, there will be no tickets for you at registration.

For everyone, to-go lunches are available all days during lunch service hour. Simply go to the regular lunch window and request a "To-Go Lunch". You can take your "To-Go Lunch" to the beach or find a nice perch on the campus.

EVENING RECEPTIONS

Friday, Saturday, and Sunday evenings an informal reception in Chapel immediately following the evening session. These evening mixers are an opportunity to continue lively discussion and interact with fellow attendees. Saturday and Sunday evenings look for authors attending their posters. There are two groups of posters (Fri-Sat and Sun-Mon).

SUNDAY AFTERNOON

There is a free afternoon. Attendees are encouraged to join others for outings. Suggest your own activity or sign up to join others. Sign-up sheets in Chapel.

MONDAY EVENING

Weather permitting, we will have a bonfire with s'mores at the firepit outside of Crocker Dining Hall following the final session. If you do not know what a s'more is we will show you!

PRESENTER GUIDELINES

Invited Speakers and Short Talk Speakers. Please arrive in the Chapel 15-20 minutes prior to the start of the session to set up your device or load your presentation onto the conference computer (PC). Remember to have your own adapters handy to connect to VGA if using your own device.

Poster Presenters. All posters are located in the Chapel. Poster boards will be numbered. There are two groups of posters, please note the posting and removal times listed below.

Friday-Saturday Posters

Mount posters by 6 pm Fri. Remove after Sat. reception.

Sunday-Monday Posters

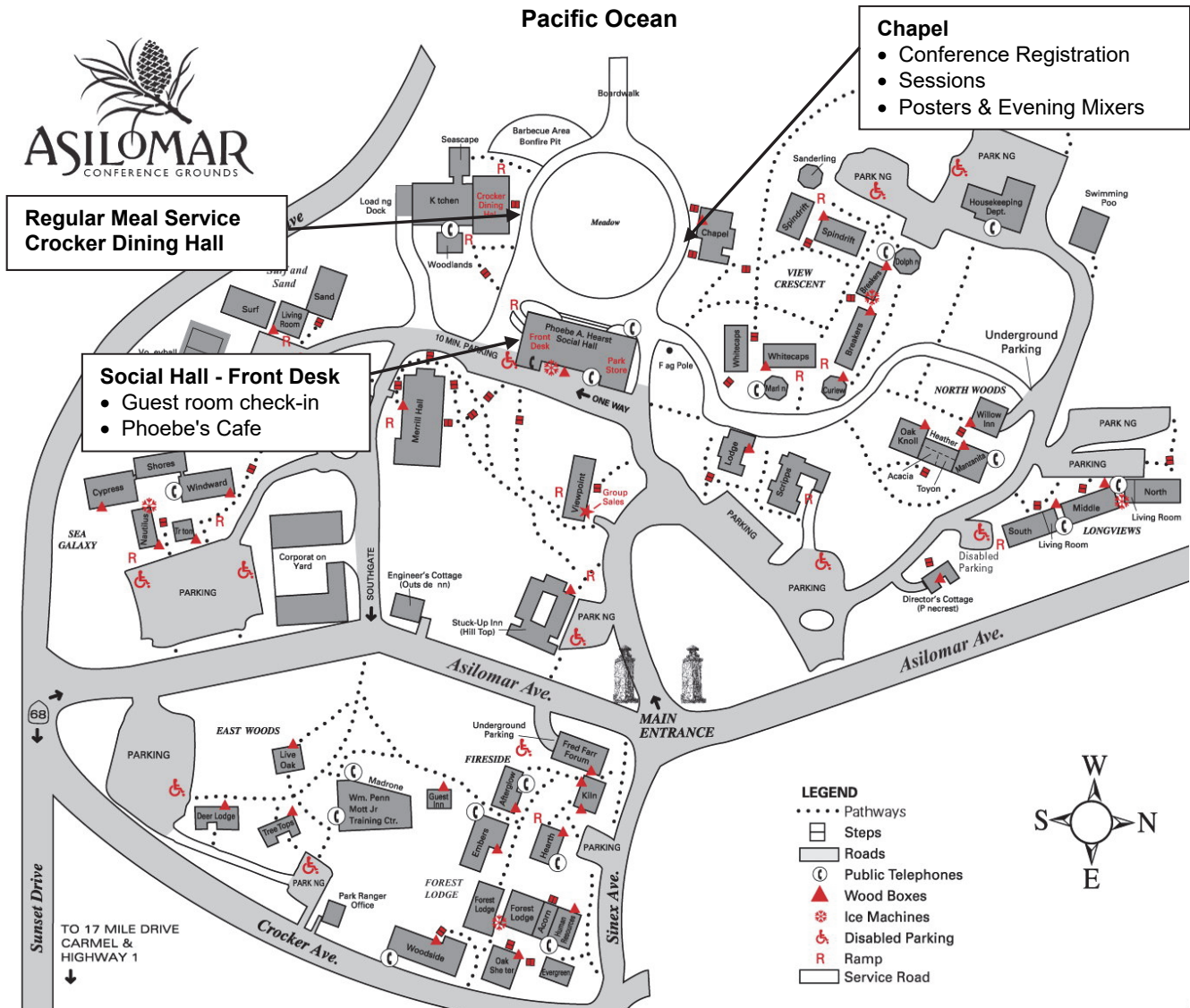
Mount posters by 9 am Sun. Remove after Mon. session.

Poster Highlight Talks. Follow instructions you received by email. Please send slides for your 2-min max talk to jennifer@asms.org by 1:00 pm on Saturday, Oct 12. This deadline is for all poster highlight talks.

PROGRAM OVERVIEW

Friday	4:15 - 6:00 pm	Badge Pickup
	6:00 - 7:00 pm	Asilomar Dinner
	7:05 - 8:30 pm	Session
	8:30 - 10:00 pm	Reception & Posters
Saturday	7:30 - 9:00 am	Asilomar Breakfast
	9:00 am - 12:05 am	Session
	10:10 - 10:40 am	Coffee Break
	12:00 - 1:00 pm	Asilomar Lunch
	1:15 - 3:00 pm	Session
	3:15 - 3:30 pm	Group Photo
	3:15 - 6:00 pm	Free Time
	6:00 - 7:00 pm	Asilomar Dinner
	7:15 - 7:45 pm	Session
	7:45 - 9:30 pm	Reception & Posters
Sunday	7:30 - 9:00 am	Asilomar Breakfast
	9:00 am - 12:05 pm	Session
	10:10 - 10:40 am	Coffee Break
	12:00 - 1:00 pm	Asilomar Lunch
	1:00 - 6:00 pm	Free Afternoon
	6:00 - 7:00 pm	Asilomar Dinner
	7:15 - 7:45 pm	Session
	7:45 - 9:30 pm	Reception & Posters
Monday	7:30 - 9:00 am	Asilomar Breakfast
	9:00 am - 12:05 pm	Session
	10:10 - 10:40 am	Coffee Break
	12:00 - 1:00 pm	Asilomar Lunch
	1:15 - 3:00 pm	Session
	3:00 - 3:30 pm	Coffee Break
	6:00 - 7:00 pm	Asilomar Dinner
	7:15 - 8:30 pm	Session
	8:30 - 10:00 pm	Bonfire & S'Mores!
Tuesday	7:30 - 9:00 am	Asilomar Breakfast
	7:30 - 9:00 am	Box lunch pick-up inside Crocker Dining Hall (Asilomar guests only)

ASILOMAR GROUNDS MAP



MONTEREY BAY AREA ATTRACTIONS

Sunday afternoon is scheduled free time. You are encouraged to relax on your own or with your fellow attendees. **Look for sign-up sheets in the session room** for those interested in group activities. Do you have a car and wish to visit the aquarium? Do you want to rent bikes with others and tour around the area? How about kayaking around Monterey Bay admiring sea otters and the renowned kelp forest as you paddle? Do you want to rent some clubs and play golf? **Be an instigator and list your activity on a sign-up sheet for others to join you.**

Some Ideas...

Accessible by foot, bus, bike or car:

- In Monterey - Monterey Bay Aquarium, Fisherman's Wharf, Cannery Row, kayaking on the bay.
- Pebble Beach attractions include the 17-Mile Drive which is accessible free-of-charge on foot or bike or enter by car for a fee.

Accessible by car:

- Carmel Valley is home to many wineries, farms, ranches and the historic Carmel Mission. Hiking in Big Sur or Point Lobos.

At Asilomar:

- Walking trails and self-guided tours throughout the Asilomar campus. Inquire at front desk for details.



WELCOME

Mass spectrometry imaging is a vibrant, rapidly developing area of research that attracts researchers from numerous fields including instrumentation development, drug discovery, biotechnology, clinical research, forensics, and beyond. The 2019 ASMS Asilomar conference on mass spectrometry imaging is timely as there will be discussion on the progress made over the last decade. This conference will bring together researchers from multiple disciplines to discuss key challenges, innovative developments, and emerging applications in mass spectrometry imaging.

We wish all attendees an enjoyable and stimulating conference at Asilomar, "the refuge by the sea".

Julia Laskin, Lingjun Li, and Jeffrey Spraggins

FRIDAY, OCTOBER 11, 2019

4:15 - 6:00 pm: Registration in *Chapel*
Materials will also be available for pick-up during the sessions.

6:00 - 7:00 pm: Asilomar Dinner, *Crocker Dining Hall*
For Asilomar lodgers with dinner tickets. Offsite lodgers may purchase dinner tickets in the Social Hall.

7:05 - 8:25 pm: **WELCOME + OPENING SESSION**

- | | |
|----------------|---|
| 7:05 - 7:15 pm | Opening Remarks; Julia Laskin, <i>Purdue University, West Lafayette, IN</i> |
| 7:15 - 7:20 pm | Introduction; Jeffrey Spraggins, <i>Vanderbilt University, Nashville, TN</i> |
| 7:20 - 8:00 pm | Next Generation MALDI Imaging Mass Spectrometry: Molecular Microscopy for the New Age of Biology and Medicine; Richard Caprioli, <i>Vanderbilt University, Nashville, TN</i> |
| 8:00 - 8:10 pm | Q & A |
| 8:10 - 8:20 pm | About the Asilomar Conference, Wendy Zhong, <i>ASMS Asilomar Committee</i> |
| 8:20 - 8:25 pm | Welcome to evening reception, Sloane Tilley, <i>HTX Imaging</i> |

8:25 - 10:00 pm: **RECEPTION + FRI-SAT POSTERS**, *Chapel*

This evening's reception is generously supported by



SATURDAY, OCTOBER 12, 2019

7:30 - 9:00 am: Asilomar Breakfast (onsite lodgers), *Crocker Dining Hall*
If you are staying offsite, you may purchase a breakfast meal ticket at the Asilomar Front Desk.

9:00 am - 12:05 pm: **NEW DEVELOPMENTS: INSTRUMENTATION & METHODS + SHORT TALK**, *Chapel*
There is a ten-minute gap after each talk for Q&A.

Session Chair: Ron Heeren (Maastricht University)

- 9:00 - 9:25 am **Molecular and Topographic Information from High-Resolution AP-SMALDI Imaging**, Bernhard Spengler, *University of Giessen, Germany*
- 9:35 - 10:00 am **Imaging Mass Spectrometry of Three-Dimensional Cell Cultures and Organoids**, Amanda Hummon, *The Ohio State University, Columbus, OH*
- 10:10 - 10:40 am COFFEE BREAK
- 10:40 - 11:05 am **Maximizing the Chemical Information from Biological Tissue Sections with MSI – Thinking Beyond m/z**, Ingela Lanekoff, *Uppsala University, Sweden*
- 11:15- 11:40 am **Metal-Assisted LDI for High Resolution Imaging MS of Neutral Lipids from Thin Tissue Sections**, Pierre Chaurand, *University of Montreal, Canada*
- 11:50 am - 12:00 pm Selected Short Talk: **Disentangling Metabolism Heterogeneity by Nanostructure Imaging Mass Spectrometry (NIMS) with Perfluorinated Gold Nanoparticles**, Amelia Palermo, *The Scripps Research Institute, La Jolla, CA*

12:05 - 1:00 pm: Asilomar Lunch, *Crocker Dining Hall*
Asilomar meal ticket required. Offsite lodgers that paid the offsite fee will have lunch tickets.

1:15 - 3:00 pm: **COMPUTATIONAL APPROACHES: DATA PROCESSING AND BIOINFORMATICS**, *Chapel*
There is a ten-minute gap after each talk for Q&A.

Session Chair: David Muddiman (North Carolina State University)

- 1:15 - 1:40 pm **Statistical Methods and Software for Mass Spectrometry Imaging**, Olga Vitek, *Northeastern University, Boston, MA*
- 1:50 - 2:15 pm **Spatial Metabolomics: From Big Data to Single Cells**, Theodore Alexandrov, *EMBL Heidelberg, Germany*
- 2:25 - 2:50 pm **Exploring the Isobaric and Isomeric Substructure of Tissue: Advanced Signal Processing and Analysis for Ion Mobility Imaging Mass Spectrometry**, Raf Van de Plas, *Delft University of Technology, Netherlands*

3:15 - 3:30 pm: **GROUP PHOTO**
Convene outside on Social Hall stairs.

3:30 - 6:00 pm: **FREE TIME**

6:00 - 7:00 pm: Asilomar Dinner, *Crocker Dining Hall*
Asilomar meal ticket required. Offsite lodgers that paid the offsite fee will have dinner tickets.

SATURDAY, OCTOBER 12, 2019, *continued*

7:15 – 7:45 pm: **FRI-SAT POSTER HIGHLIGHT TALKS + SPECIAL PRESENTATION**, Chapel
Brief two-minute max presentations. No Q&A (visit their posters!)

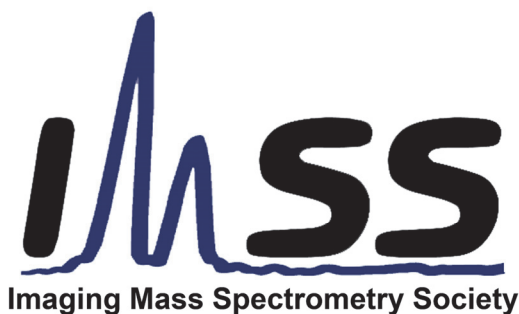
Session Co-Chairs: Bingming Chen (Merck) and Ryan Kelly (Brigham Young University)

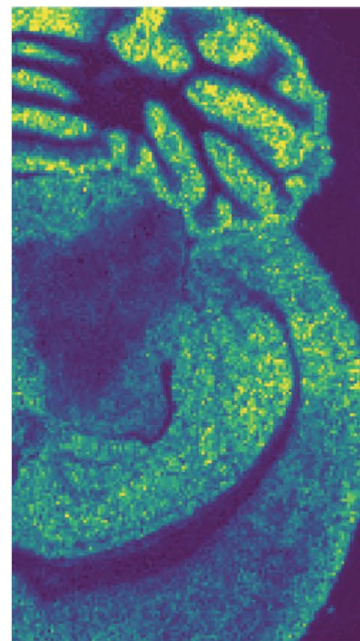
- Highlight A **A Versatile Instrument Repeatability and Lateral Resolution Strategy for Mass Spectrometry Imaging using Cell Bioprinting**; Anqi Tu, *North Carolina State University, Raleigh, NC* [Poster 1]
- Highlight B **Building a Chemical Atlas of the Human Kidney with 3-D Multimodal Molecular Imaging**; Elizabeth Neumann, *Vanderbilt University, Nashville, TN* [Poster 3]
- Highlight C **Development of a Mass Spectrometry-Based Method For Analysis of a Maternal-Placenta-Fetal Model in Mice**; Alana Rister, *University of Nebraska - Lincoln, Lincoln, NE* [Poster 5]
- Highlight D **CycloBranch: Summary Formulas Annotation Applied to Multimodal Fusion in imzML Dataset**; Vladimir Havlicek, *Institute of Microbiology of the CAS, Prague 4, Czech Republic* [Poster 7]
- Highlight E **Use of an In-House Sublimation Chamber for the Analysis of Lipids in a Primary Demyelination Model of Murine Spinal Cords**; Emily Sekera, *University at Buffalo, Buffalo, NY* [Poster 10]
- Highlight F **Quantitative Imaging Mass Spectrometry Using the Mimetic Tissue Model**; Jeremy Barry, *GlaxoSmithKline, Collegeville, PA* [Poster 12]
- Highlight G **Ethanol-Fixed, Paraffin-Embedded Tissue Imaging: Implications in Alzheimer's Disease Research**; Andrea Kelley, *University of Texas at San Antonio, San Antonio, TX* [Poster 14]
- Highlight H **MSiReader: Open-Source Software for Visualization and Analysis of MSI Data**; Kenneth Garrard, *FTMS Laboratory for Human Health Research, Department of Chemistry, Raleigh, NC* [Poster 17]
- Highlight I **Development of an Analysis Pipeline for Measuring Adherence to HIV Pre-Exposure Prophylaxis in Hair using IR-MALDESI MSI**; Joseph Mwangi, *The University of North Carolina at Chapel Hill, Pittsboro, NC* [Poster 20]
- Highlight J **Fourier Transform Mass Spectrometry Imaging of Zebrafish in the Context of Environmental Health**; Franklin E. Leach III, *University of Georgia, Athens, GA* [Poster 23]
- Highlight K **Development and Validation of Analysis Reproducibility with a Mimetic Kidney Tissue Model for Spatial Metabolomics QC**; Jessica Lukowski, *Pacific Northwest National Laboratory, Richland, WA* [Poster 25]
- Highlight L **Quantitative Detection of Gemcitabine Distribution in Mouse Models of Pancreatic Cancer using MALDI Mass Spectrometry Imaging**; Kristine Glunde, *Johns Hopkins University School of Medicine, Baltimore, MD* [Poster 21]

7:40 - 7:45 pm **Welcome to Evening Reception**, Kevin Schey, *International Mass Spectrometry Society*

7:45 - 9:30 pm: **EVENING RECEPTION + FRI-SAT POSTERS**, Chapel
See Poster List, Friday-Saturday Posters on pages 10-11.

This evening's reception is generously supported by





Our mission

- Promote the development and application of imaging mass spectrometry (IMS)
- Enhance the IMS community by disseminating best practices and acceptance criteria for IMS methodology
- Provide IMS educational opportunities
- Collaborate with other societies that have similar goals

Come join the fun!

Membership benefits include:

- Discounted registration fees at conferences
- Presentation opportunities
- Educational activities
- Professional networking

Join us at:



The Association for
Mass Spectrometry:
Applications to the Clinical Lab

March 29-April 3, 2020
Palm Springs, CA

SUNDAY, OCTOBER 13, 2019

7:30 - 9:00 am: Asilomar Breakfast (onsite lodgers only), *Crocker Dining Hall*
If you are staying offsite, you may purchase a breakfast meal ticket at the Asilomar Front Desk.

9:00 am – 12:05 pm: **BIOMEDICAL APPLICATIONS + SHORT TALK**, *Chapel*
There is a ten-minute gap after each talk for Q&A.

Session Chair: Carol Nilsson (Lund University)

- | | |
|------------------|---|
| 9:00 - 9:25 am | Multi-Modal Mass Spectrometry Imaging of Tumors , Adam Taylor, <i>National Physical Laboratory, Teddington, United Kingdom</i> |
| 9:35 - 10:00 am | Applications of N-glycan MALDI Imaging for Identification of Cancer Biomarkers and New Diagnostic Targets , Richard Drake, <i>Medical University of South Carolina, Charleston, SC</i> |
| 10:10 - 10:40 am | COFFEE BREAK |
| 10:40 - 11:05 am | Mass Spectrometry Imaging Applications for Anatomic Pathology and Oncology , Nathalie Agar, <i>Brigham and Women's Hospital, Harvard Medical School, Boston, MA</i> |
| 11:15 - 11:40 am | Imaging Mass Spectrometry of Lipid Isomers Using Gas Phase Ion/Ion Reactions , Boone Prentice, <i>University of Florida, Gainesville, FL</i> |
| 11:50 - 12:00 pm | Selected Short Talk: Targeting the CNS: Quantitative MALDI-Imaging Mass Spectrometry to Understand Penetration of the Blood Brain Barrier Using a Pgp Knockout Rat , Nichole M. Lareau, <i>GlaxoSmithKline, Collegeville, PA</i> |

12:05 - 1:00 pm: Asilomar Lunch, *Crocker Dining Hall*
Asilomar meal ticket required. Offsite lodgers that paid the offsite fee will have lunch tickets.

1:00 - 6:00 pm: Free Afternoon

6:00 - 7:00 pm: Asilomar Dinner, *Crocker Dining Hall*
Meal ticket required.

7:15 – 7:45 pm: **SUN-MON POSTER HIGHLIGHT TALKS + SPECIAL PRESENTATION**, *Chapel*
Brief two-minute max presentations. No Q&A (visit their posters!)

Session Co-Chairs: Ingela Lanekoff (Uppsala University) and Prentice Boone (University of Florida)

- | | |
|-------------|--|
| Highlight A | IR-MALDESI MSI Reveals Altered Lipid Distributions in Vitamin D Deficient Zebrafish ; Whitney Stutts, <i>Molecular Education, Technology, and Research Innovation Center, North Carolina State University, Raleigh, NC</i> [Poster 1] |
| Highlight B | Understanding and Minimizing Visceral Fat Delocalisation in Mass Spectrometry Imaging ; Frédéric Fournelle, <i>Université de Montréal, Montréal, QC</i> [Poster 3] |
| Highlight C | Investigating Cardiolipin Aberrations in Brain Cancer using Desorption Electrospray Ionization coupled to High Field Asymmetric Ion Mobility Mass Spectrometry Imaging ; Anna Krieger, <i>University of Texas at Austin, Austin, TX</i> [Poster 5] |
| Highlight D | Spatial Characterization and Identification of Biomolecules Using Combined LESA and MALDI-MSI ; Dylan Nicholas Tabang, <i>Department of Chemistry, University of Wisconsin, Madison, WI</i> [Poster 7] |
| Highlight E | Spatially Mapping Intact Proteins and Protein Complexes in Tissue with Native Liquid Extraction Surface Analysis Mass Spectrometry ; Oliver Hale, <i>University of Birmingham, Birmingham, United Kingdom</i> [Poster 10] |
| Highlight F | Organic Salt Matrix Assisted Mass Spectrometry Imaging Identifies Novel Glomerular and Non-glomerular Metabolite Markers in Human Kidney Tissue ; Annapurna Pamreddy, <i>Center for Renal Precision Medicine, Division of Nephrology, Department of Medicine, The University of Texas Health San Antonio, San Antonio, TX</i> [Poster 12] |
| Highlight G | MALDI FTICR-MS Imaging of Lipids and Metabolites in Rat Brain: Towards Applications in Traumatic Brain Injury ; Clint Alfaro, <i>Georgia Institute of Technology, Atlanta, GA</i> [Poster 15] |
| Highlight H | Metabolomic Markers of Immunotherapy Response in Syngeneic Tumor Models ; Mary King, <i>University of Texas at Austin, Austin, TX</i> [Poster 17] |

SUNDAY, OCTOBER 13, 2019, *continued*

- Highlight I **Advances in Visualisation and Analysis for High-performance Ion Mobility Imaging Mass Spectrometry Data**; Lukasz Migas, *Delft University of Technology, Delft, Netherlands* [Poster 20]
- Highlight J **Multiplexed Ion Beam Imaging for Single Cell Phenotyping**; Jay Tarolli, *Ionpath, Menlo Park, CA* [Poster 22]
- Highlight K **Single-Myofiber Analysis Using High Spatial Resolution Nanospray Desorption Electrospray Ionization Mass Spectrometry Imaging (nano-DESI MSI)**; Daisy Unsihuay Vila, *Purdue University, West Lafayette, IN* [Poster 24]
- Highlight L **Sub-Micron 3D Imaging Combined with Automated, High Mass Resolution MS/MS**; Alexander PirkI, *IONTOF GmbH, Muenster, Germany* [Poster 26]
- Highlight M **Bacteria Fight Club: Mapping Microbial Behavior with Mass Spectrometry Imaging**; Berkley Ellis, *Vanderbilt University, Nashville, TN* [Poster 28]

7:40 - 7:45 pm **Welcome to Evening Reception**, Roy Martin, *Waters Corporation*

7:45 - 9:30 pm: **EVENING RECEPTION + SUN-MON POSTERS**, Chapel
See Poster List, Sunday-Monday Posters on pages 10-11.

This evening's reception is generously supported by

Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

MONDAY, OCTOBER 14, 2019

7:30 - 9:00 am: Asilomar Breakfast (onsite lodgers only), *Crocker Dining Hall*
If you are staying offsite, you may purchase a breakfast meal ticket at the Asilomar Front Desk.

9:00 am - 12:05 pm: **HYPHENATED TECHNIQUES + SHORT TALK**, Chapel
There is a ten-minute gap after each talk for Q&A.

Session Chair: Raf Van de Plas (*Delft University of Technology*)

- 9:00 - 9:25 am **Correlated Materials Characterization via Multimodal Chemical and Functional Imaging**, Olga Ovchinnikova, *Oak Ridge National Laboratory, Oak Ridge, TN*
- 9:35 - 10:00 am **High Resolution Multimodal Molecular Imaging for Translational Research**, Ron M.A. Heeren, *Maastricht University, Netherlands*
- 10:10 - 10:40 am COFFEE BREAK
- 10:40 - 11:05 am **IR MALDESI: An Innovative Platform for Mass Spectrometry Imaging**, David Muddiman, *North Carolina State University, Raleigh, NC*
- 11:15- 11:40 am **Imaging Mass Spectrometry: A New Tool in Correlated Multimodal Imaging Workflows**, Martina Marchetti-Deschman, *Vienna University of Technology, Austria*
- 11:50 am - 12:00 pm Selected Short Talk: **Advances in High Magnetic Field FT-ICR Mass Spectrometry Imaging**, Donald Smith, *National High Magnetic Field Laboratory, Tallahassee, FL*

12:05 - 1:00 pm: Asilomar Lunch (all attendees), *Crocker Dining Hall*
Asilomar meal ticket required. Offsite lodgers that paid the offsite fee will have lunch tickets.

MONDAY, OCTOBER 14, 2019, *continued*

1:15 - 3:00 pm: **IMAGING IN DRUG DISCOVERY AND METABOLOMICS**, Chapel
There is a ten-minute gap after each talk for Q&A.

Session Chair: Stephen Castellino (GlaxoSmithKline)

- 1:15 - 1:40 pm **Mass Spectrometry-Based Imaging at Merck: Enabling Rapid Tissue Distribution of Drugs and Metabolites in Drug Discovery and Development**, Bingming Chen, *Merck, West Point, PA*
- 1:50 - 2:15 pm **MALDI Mass Spectrometry Imaging in Metabolomics Scale**, Young Jin Lee, *Iowa State University, Ames, IA*
- 2:25 - 2:50 pm **Extract Metabolomic Information Using Mass Spectrometry Imaging Experiment Combined with Advanced Data Analysis**, Zhibo Yang, *University of Oklahoma, Norman, OK*

3:00 – 3:30 pm: **COFFEE BREAK**

3:30 - 4:00 pm: **SHORT TALK SESSION**, Chapel
There is a five-minute gap after each talk for Q&A.

Session Chair: Lingjun Li (University of Wisconsin, Madison)

- 3:30 - 3:40 pm **Imaging Mass Spectrometry of Aged Human Retina Tissue Reveals Molecular Markers of AMD**, Kevin Schey, *Vanderbilt University, Nashville, TN*
- 3:45 - 3:55 pm **Single-Cell Metabolomics with Rapid Determination of Chemical Formulas from Isotopic Fine Structures: Elucidating Heterogeneous Cell Populations Within Soybean Root Nodules**, Christopher Anderton, *Pacific Northwest National Laboratory, Richland, WA*

4:00 - 5:10 pm: **UNDERSTANDING BIOLOGICAL PROCESSES**, Chapel
There is a ten-minute gap after each talk for Q&A.

Session Chair: Christopher Anderton (PNNL)

- 4:00 - 4:25 pm **Comprehensive Mapping of Neurotransmitter Networks by MALDI-Mass Spectrometry Imaging**, Per Andren, *Uppsala University, Sweden*
- 5:35 - 5:00 pm **Cartography of People**, Pieter Dorrestein, *University of California, San Diego, La Jolla, CA*

6:00 - 7:00 pm: Asilomar Dinner, *Crocker Dining Hall*
Asilomar meal ticket required. Offsite lodgers that paid the offsite fee will have dinner tickets.

7:15 - 8:30 pm: **SINGLE-CELL AND SUBCELLULAR IMAGING**, Chapel
There is a ten-minute gap after each talk for Q&A.

Session Chair: Zhibo Yang (University of Oklahoma)

- 7:15 - 7:40 pm **MSI and Single Cell Multi-omics: Measuring the Peptides, Metabolites and Transcripts from the Same Tissues and Cells**, Jonathan Sweedler, *University of Illinois, Urbana-Champaign*
- 7:50 - 8:15 pm **nanoPOTS Sample Processing Enables In-Depth Proteome Profiling of Single Mammalian Cells**, Ryan Kelly, *Brigham Young University, Provo, UT*
- 8:25 - 8:30 pm **Discussion and Closing Remarks**, Lingjun Li, *University of Wisconsin, Madison*

8:30 - 9:30 pm: **BONFIRE! S'MORES + DRINKS**
Protected Firepit Area near Crocker Dining Hall. Weather and wind dependent.

TUESDAY, OCTOBER 15, 2019

7:30 - 9:00 am: Asilomar Breakfast, *Crocker Dining Hall*

7:30 - 9:00 am: Box Lunch Pick-up for Asilomar Lodgers.
Use your remaining lunch ticket for redemption. Look for email on exact location of box lunch pick-up.

POSTER LIST

FRIDAY-SATURDAY POSTERS

The Friday-Saturday Posters will be displayed from 6:00 pm, Friday - 9:30 pm, Saturday night.
Posters will be presented (attended by author) during the Saturday evening reception.

- | | |
|-------------------|--|
| Fri-Sat Poster 1 | A Versatile Instrument Repeatability and Lateral Resolution Strategy for Mass Spectrometry Imaging using Cell Bioprinting; Anqi Tu, <i>North Carolina State University, Raleigh, NC</i> |
| Fri-Sat Poster 2 | High-Resolution Imaging of Cachectic Muscle Tissue Reveals Multiple, Overlapping Salt Adducts of Polyanionic Energy Metabolome Species; William Hardesty, <i>GlaxoSmithKline, Collegeville, PA</i> |
| Fri-Sat Poster 3 | Building a Chemical Atlas of the Human Kidney with 3-D Multimodal Molecular Imaging; Elizabeth Neumann, <i>Vanderbilt University, Nashville, TN</i> |
| Fri-Sat Poster 4 | Investigating the Tissue Distribution Profiles of Targeted Drug Delivery Platforms by MALDI IMS; Reid Groseclose, <i>GlaxoSmithKline, Collegeville, PA</i> |
| Fri-Sat Poster 5 | Development of a Mass Spectrometry-Based Method For Analysis of a Maternal-Placenta-Fetal Model in Mice; Alana Rister, <i>University of Nebraska - Lincoln, Lincoln, NE</i> |
| Fri-Sat Poster 6 | High-Performance Lipid Imaging on a Prototype MALDI timsTOF Pro; Katerina Djambazova, <i>Department of Chemistry, Vanderbilt University, Nashville, TN</i> |
| Fri-Sat Poster 7 | CycloBranch: Summary Formulas Annotation Applied to Multimodal Fusion in imzML Dataset; Vladimir Havlicek, <i>Institute of Microbiology of the CAS, Prague 4, Czech Republic</i> |
| Fri-Sat Poster 8 | Preparation of Agar-Based Microbial Cultures for MALDI IMS Using an Automated Matrix Sprayer; Justin Jens, <i>University of Colorado-Anschutz Medical Campus, Aurora, CO</i> |
| Fri-Sat Poster 9 | N-Glycan MALDI-IMS of High Versus Low CA19-9 Antigen Expressing Primary and Metastatic Pancreatic Cancer Tissues; Colin McDowell, <i>Medical University of South Carolina, Charleston, SC</i> |
| Fri-Sat Poster 10 | Use of an In-House Sublimation Chamber for the Analysis of Lipids in a Primary Demyelination Model of Murine Spinal Cords; Emily Sekera, <i>University at Buffalo, Buffalo, NY</i> |
| Fri-Sat Poster 11 | Imaging Mass Spectrometry Reveals Crosstalk between Pancreatic Cancer Cells and Surrounding Tumor Microenvironment with Pancreatic Stellate Cells; Yuan Liu, <i>University of Wisconsin-Madison, Madison, WI</i> |
| Fri-Sat Poster 12 | Quantitative Imaging Mass Spectrometry Using the Mimetic Tissue Model; Jeremy Barry, <i>GlaxoSmithKline, Collegeville, PA</i> |
| Fri-Sat Poster 13 | Spatial Visualization of Renal Metabolic Fluxes Using Imaging Mass Spectrometry; Lin Wang, <i>Princeton University, Princeton</i> |
| Fri-Sat Poster 14 | Ethanol-Fixed, Paraffin-Embedded Tissue Imaging: implications in Alzheimer's Disease Research; Andrea Kelley, <i>University of Texas at San Antonio, San Antonio, TX</i> |
| Fri-Sat Poster 15 | Investigating Allosteric Inhibition of the Protein Tyrosine Phosphatase PTP1B in Animal Models of Rett Syndrome; Christopher A Bonham, <i>Cold Spring Harbor Laboratory, Cold Spring Harbor, NY</i> |
| Fri-Sat Poster 16 | Combining the AP MALDI Source and High-Resolution Mass Spectrometer to Reveal Structures of Gangliosides in MS Imaging Using Volatile Matrices; Eugene Moskovets, <i>MassTech Inc, Columbia, MD</i> |
| Fri-Sat Poster 17 | MSiReader: Open-Source Software for Visualization and Analysis of MSI Data; Kenneth Garrard, <i>FTMS Laboratory for Human Health Research, Department of Chemistry, Raleigh, NC</i> |
| Fri-Sat Poster 18 | DESI and MALDI Mass Spectrometry Imaging of Drugs and Its Effect in Hepatocellular Carcinoma Mouse Models; Presha Rajbhandari, <i>Columbia University, New York, NY</i> |
| Fri-Sat Poster 19 | Automatic Molecular Annotation of Mass Spectrometry Imaging data; Nannan Tao, <i>Bruker Daltonics Inc., San Jose, CA</i> |
| Fri-Sat Poster 20 | Development of an Analysis Pipeline for Measuring Adherence to HIV Pre-Exposure Prophylaxis in Hair using IR-MALDESI MSI; Joseph Mwangi, <i>The University of North Carolina at Chapel Hill, Pittsboro, NC</i> |
| Fri-Sat Poster 21 | Quantitative Detection of Gemcitabine Distribution in Mouse Models of Pancreatic Cancer using MALDI Mass Spectrometry Imaging; Kristine Glunde, <i>Johns Hopkins University School of Medicine, Baltimore, MD</i> |
| Fri-Sat Poster 22 | Investigating <i>Acinetobacter baumannii</i> Murine Respiratory Infections with MALDI Imaging Mass Spectrometry; Emilio Rivera, <i>Vanderbilt University, Nashville, TN</i> |

POSTER LIST

FRIDAY-SATURDAY POSTERS, *continued*

The Friday-Saturday Posters will be displayed from 6:00 pm, Friday - 9:30 pm, Saturday night.
Posters will be presented (attended by author) during the Saturday evening reception.

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|-------------------|--|
| Fri-Sat Poster 23 | Fourier Transform Mass Spectrometry Imaging of Zebrafish in the Context of Environmental Health; Franklin E. Leach III, <i>University of Georgia, Athens, GA</i> |
| Fri-Sat Poster 24 | Deep-ultraviolet Laser Ablation Microsampling of Tissue Combined with MALDI Imaging; Remilekun Lawal, <i>Louisiana State University, Baton Rouge, LA</i> |
| Fri-Sat Poster 25 | Development and Validation of Analysis Reproducibility with a Mimetic kidney Tissue Model for Spatial Metabolomics QC; Jessica Lukowski, <i>Pacific Northwest National Laboratory, Richland, WA</i> |
| Fri-Sat Poster 26 | Imaging N-glycans in Pancreatic Intraepithelial Neoplasia in Mouse Pancreatic Cancer Model with MALDI Mass Spectrometry; Meng Xu, <i>University of Wisconsin - Madison, Madison, WI</i> |
| Fri-Sat Poster 27 | Improving Metabolite Identification During Imaging by Desorption Electrospray Ionization (DESI) Mass Spectrometry; Bindesh Shrestha, <i>Waters Corp., Beverly, MA</i> |
| Fri-Sat Poster 28 | Cancelled |
| Fri-Sat Poster 29 | Characterizing the Capabilities of Lipid imaging on a MALDI-Q-TOF with Trapped Ion Mobility Separation; Shannon Cornett, <i>Bruker Daltonics Inc., Billerica, MA</i> |

SUNDAY-MONDAY POSTERS

The Sunday-Monday Posters will be displayed from 9:00 am, Sunday – 8:30 pm, Monday night.
Posters will be presented (attended by author) during the Sunday evening reception.

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|-------------------|---|
| Sun-Mon Poster 1 | IR-MALDESI MSI Reveals Altered Lipid Distributions in Vitamin D Deficient Zebrafish; Whitney Stutts, <i>Molecular Education, Technology, and Research Innovation Center, North Carolina State University, Raleigh, NC</i> |
| Sun-Mon Poster 2 | Expression of Proteomics in Different Stages Pathogenesis Gas Gangrene due to <i>Clostridium chauvoei</i> using Liquid Chromatography Mass Spectrometry (LC-MS/MS); Barbara Dominiak, <i>Temple University, Philadelphia, PA</i> |
| Sun-Mon Poster 3 | Understanding and Minimizing Visceral Fat Delocalisation in Mass Spectrometry Imaging; Frédéric Fournelle, <i>Université de Montréal, Montréal, QC</i> |
| Sun-Mon Poster 4 | Genotypic and Developmental Changes of Amino Acid Localization in Maize Roots Determined by Mass Spectrometry Imaging; Kelly O'Neill, <i>Iowa State University, Ames, IA</i> |
| Sun-Mon Poster 5 | Investigating Cardiolipin Aberrations in Brain Cancer using Desorption Electrospray Ionization Coupled to High Field Asymmetric Ion Mobility Mass Spectrometry Imaging; Anna Krieger, <i>University of Texas at Austin, Austin, TX</i> |
| Sun-Mon Poster 6 | The Seven S Criteria for Evaluating Performance of MALDI Mass Spectrometer for MSI; Marvin Vestal, <i>Virgin Instruments Corp., Marlborough, MA</i> |
| Sun-Mon Poster 7 | Spatial Characterization and Identification of Biomolecules Using Combined LESA and MALDI-MSI; Dylan Nicholas Tabang, <i>Department of Chemistry, University of Wisconsin, Madison, WI</i> |
| Sun-Mon Poster 8 | Cancelled |
| Sun-Mon Poster 9 | Investigating Metabolic Changes in Murine pheochromocytoma Models by DESI-MSI; Sarah Noll, <i>Department of Chemistry, Stanford University, Stanford, CA</i> |
| Sun-Mon Poster 10 | Spatially Mapping Intact Proteins and Protein Complexes in Tissue with Native Liquid Extraction Surface Analysis Mass Spectrometry; Oliver Hale, <i>University of Birmingham, Birmingham, United Kingdom</i> |
| Sun-Mon Poster 11 | Multimodal Spatial Proteomics on a MALDI timsTOF Pro; Dustin Klein, <i>Mass Spectrometry Research Center, Vanderbilt University, Nashville, TN</i> |

POSTER LIST

SUNDAY-MONDAY POSTERS, *continued*

The Sunday-Monday Posters will be displayed from 9:00 am, Sunday – 8:30 pm, Monday night.
Posters will be presented (attended by author) during the Sunday evening reception.

- Sun-Mon Poster 12 **Organic Salt Matrix Assisted Mass Spectrometry Imaging Identifies Novel Glomerular and Non-glomerular Metabolite Markers in Human Kidney Tissue**; Annapurna Pamreddy, *Center for Renal Precision Medicine, Division of Nephrology, Department of Medicine, The University of Texas Health San Antonio, San Antonio, TX*
- Sun-Mon Poster 13 **Comprehensive MALDI-Imaging Mass Spectrometry Workflow for Analysis of Mammalian Tissue**; Ryan Walsh, Scott Kuzdzal; *Shimadzu Scientific Instruments, Columbia, MD*
- Sun-Mon Poster 14 **High-resolution nano-DESI imaging of mice tibialis anterior muscle**; Daniela Mesa Sanchez, *Purdue University, West Lafayette, IN*
- Sun-Mon Poster 15 **MALDI FTICR-MS Imaging of Lipids and Metabolites in Rat Brain: Towards Applications in Traumatic Brain Injury**; Clint Alfaro, *Georgia Institute of Technology, Atlanta, GA*
- Sun-Mon Poster 16 **Visualization of the Spatial Distribution of Tenofovir, Emtricitabine, Efavirenz, and Rilpivirine in Tissues Using MALDI Mass Spectrometry Imaging**; Herana Seneviratne, *Johns Hopkins University School of Medicine, Baltimore, MD*
- Sun-Mon Poster 17 **Metabolomic Markers of Immunotherapy Response in Syngeneic Tumor Models**; Mary King, *University of Texas at Austin, Austin, TX*
- Sun-Mon Poster 18 **Characterization of Lipid Biosynthesis through MALDI Based Mass Isotope Distribution Analysis**; Daniel Downes, *Merck & Co. Inc., Kenilworth, NJ*
- Sun-Mon Poster 19 **MALDI Mass Spectrometry Imaging of N-Glycan Profiles of Molecular Subclasses of Human Hepatocellular Carcinoma**; Andrew Delacourt, *Medical University of South Carolina, Charleston, SC*
- Sun-Mon Poster 20 **Advances in Visualisation and Analysis for High-performance Ion Mobility Imaging Mass Spectrometry Data**; Lukasz Migas, *Delft University of Technology, Delft, Netherlands*
- Sun-Mon Poster 21 **Design and characterization of novel sprayer for high resolution tissue imaging by desorption electrospray ionization**; Stephen Hattan, *Waters Corporation, Milford, MA*
- Sun-Mon Poster 22 **Multiplexed Ion Beam Imaging for Single Cell Phenotyping**; Jay Tarolli, *Ionpath, Menlo Park, CA*
- Sun-Mon Poster 23 **Adapting MALDI Imaging Mass Spectrometry Workflows for N-Glycan Profiling of Clinical Biofluids on Glass Slides**; Calvin Blaschke, *Medical University of South Carolina, Charleston, SC*
- Sun-Mon Poster 24 **Single-Myofiber Analysis Using High Spatial Resolution Nanospray Desorption Electrospray Ionization Mass Spectrometry Imaging (nano-DESI MSI)**; Daisy Unsihuay Vila, *Purdue University, West Lafayette, IN*
- Sun-Mon Poster 25 **Three-Dimensional Imaging of Organic Light Emitting Device by Laser Desorption Ionization-Mass Spectrometry**; Jaehan Lee, *Samsung Display, Asan, South Korea*
- Sun-Mon Poster 26 **Sub-Micron 3D Imaging Combined with Automated, High Mass Resolution MS/MS**; Alexander PirkI, *IONTOF GmbH, Muenster, Germany*
- Sun-Mon Poster 27 **Pushing the Resolution of Molecular Mass-Spectrometry Imaging Using Machine Learning on Coregistered ToF-SIMS and MALDI Datasets**; Nick Borodinov, *Oak Ridge National Laboratory, Oak Ridge, TN*
- Sun-Mon Poster 28 **Bacteria Fight Club: Mapping Microbial Behavior with Mass Spectrometry Imaging**; Berkley Ellis, *Vanderbilt University, Nashville, TN*
- Sun-Mon Poster 29 **Direct Analysis of Formalin-Fixed Paraffin-Embedded (FFPE) and Flash-Frozen Tissues using Infrared Matrix-Assisted Laser Desorption Electrospray Ionization (IR-MALDESI) Mass Spectrometry Imaging**; Sitora Khodjaniyazova, *FTMS Laboratory for Human Health Research, Department of Chemistry, Raleigh, NC*



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