



Write your name here:

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## 34<sup>th</sup> Asilomar Conference on Mass Spectrometry

### QUANTITATIVE ANALYSIS OF POSTTRANSLATIONAL MODIFICATIONS BY MASS SPECTROMETRY

Friday, November 2 - Tuesday, November 6, 2018  
Asilomar Conference Center, Pacific Grove, CA

#### Organizers

**Heather Desaire**  
*University of Kansas*

**Nicolas L. Young**  
*Baylor College of Medicine*

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#### ASMS Asilomar Committee

**David Arnott**  
*Genentech*

**Wendy Zhong**  
*Merck & Co.*

**Benjamin Garcia**  
*University of Pennsylvania School of Medicine*

**Vicki Wysocki, Board Representative**  
*The Ohio State University*

## 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, outside the Woodlands section of main dining hall. Woodlands is at the end of main dining hall furthest from the ocean.*

For attendees staying offsite you will have (3) lunch tickets to pick up from Jennifer inside Chapel with your name badge. If for some reason you did not pay the offsite fee, there will be no tickets for you at registration. You may purchase breakfast or dinner meal tickets at the Front Desk inside the Social Hall.

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".

Conference Bonfire on Monday evening. We are planning to hold a bonfire reception on Monday evening following the evening talks. There will be s'mores to make and beverages to drink. This activity is weather/wind dependent. Bring your jacket with you to the evening talks so

### EVENING RECEPTIONS

Friday, Saturday, Sunday, and Monday evenings an informal reception is held 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.

### PRESENTER GUIDELINES

Invited Speakers and Hot Topic 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.

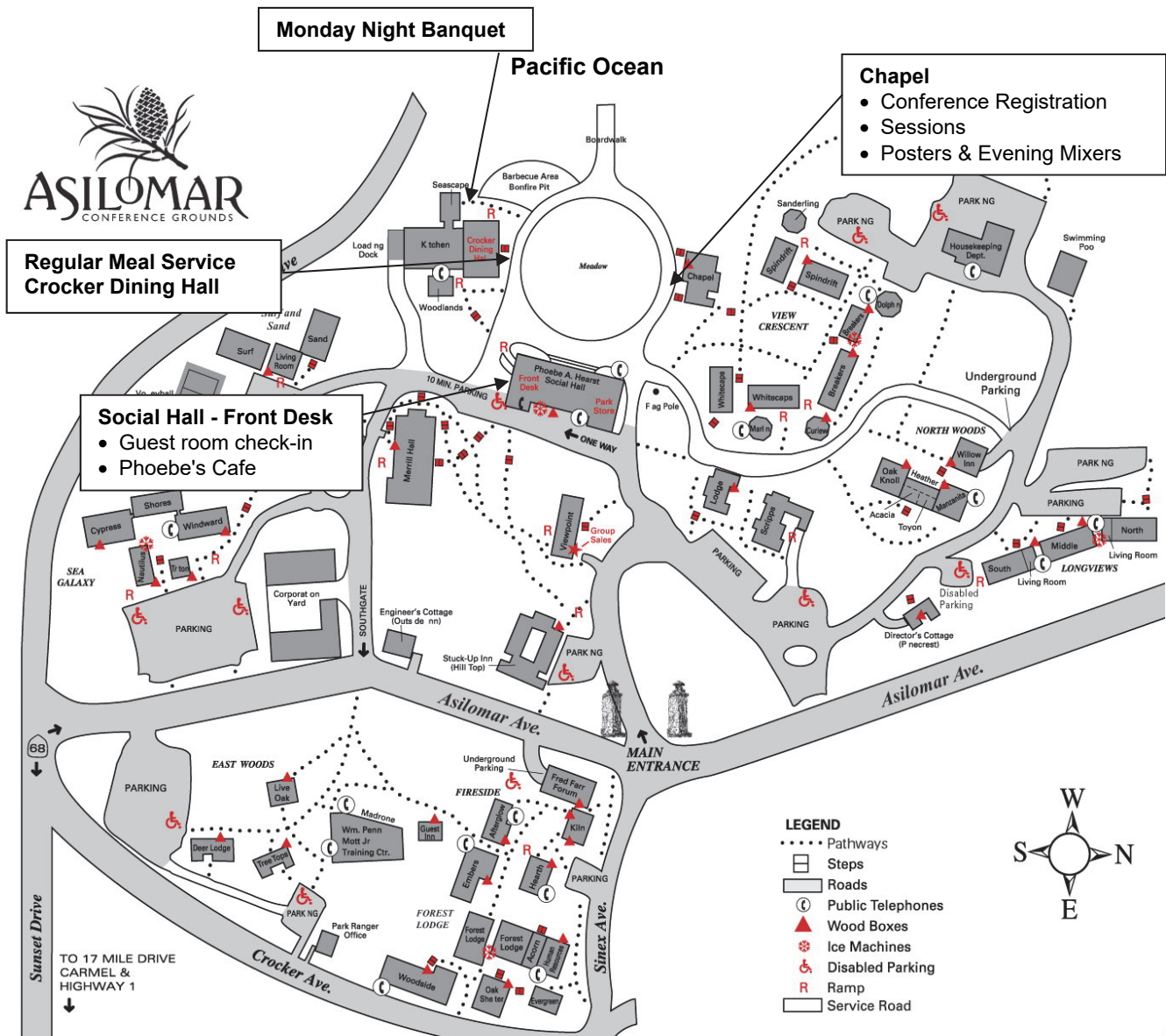
Posters. Please display your poster when you arrive (anytime after 4:00 pm on Friday). Remove your poster on Monday afternoon (at your leisure). There will be poster viewing throughout the meeting. Presenting is during the evening receptions Friday, Saturday, and Sunday. This is informal. Presenters are encouraged to enjoy social atmosphere of evening mixers.

Poster Highlight Talks. Please load your short highlight presentation onto the session room laptop (on speaker table) by 6:45 pm the evening of your highlight talk.

### PROGRAM OVERVIEW

Friday	4:00 - 6:00 pm .....	Badge Pickup
	6:00 - 7:00 pm .....	Asilomar Dinner
	7:05 - 8:30 pm .....	Session
	8:40 - 10:00 pm .....	Mixer & Posters
Saturday	7:30 - 9:00 am .....	Asilomar Breakfast
	9:00 - 10:35 am .....	Session
	10:35 - 10:55 am .....	Coffee Break
	10:55 am - 12:05 pm .....	Session
	12:05 - 1:00 pm .....	Asilomar Lunch
	1:15 - 2:25 pm .....	Session
	2:25 - 2:40 pm .....	Coffee Break
	2:40 - 3:40 pm .....	Session
	3:40 - 3:50 pm .....	Group Photo
	3:50 - 6:00 pm .....	Free Time
	6:00 - 7:00 pm .....	Asilomar Dinner
	7:15 - 7:35 pm .....	Session
	7:35 - 9:30 pm .....	Mixer & Posters
Sunday	7:30 - 9:00 am .....	Asilomar Breakfast
	9:00 - 10:35 am .....	Session
	10:35 - 10:55 am .....	Coffee Break
	10:55 am - 12:05 pm .....	Session
	12:05 - 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 .....	Mixer & Posters
Monday	7:30 - 9:00 am .....	Asilomar Breakfast
	9:00 - 10:35 am .....	Session
	10:35 - 10:55 am .....	Coffee Break
	10:55 am - 12:05 pm .....	Session
	12:05 - 1:00 pm .....	Asilomar Lunch
	1:15 - 2:25 pm .....	Session
	2:25 - 2:45 pm .....	Coffee Break
	2:45 - 3:45 pm .....	Session
	3:45 - 6:00 pm .....	Free Time
	6:00 - 7:15 pm .....	Asilomar Dinner
	7:15 - 8:25 pm .....	Session
	8:25 - 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-ups 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.



## WELCOME

The quantitative analysis of post-translational modifications has become an increasingly important capacity in mass spectrometry-based proteomics. This is due to fundamental biology converging on the abundance and dynamics of post-translational modifications as essential to a myriad of processes. However, the challenges of accurate and reproducible quantitation of post-translational modifications by mass spectrometry are substantially different from protein identification or even post-translational modification identification and localization. At this conference we will address the challenges of this emerging capacity as a community, the latest methods, technology and data analysis approaches and apply them to questions ranging from fundamental biology to clinical applications.

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

*Heather Desaire and Nick Young*

## FRIDAY, NOVEMBER 2, 2018

4:00 - 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 - 8:30 pm: **WELCOME + OPENING SESSION**  
*There is a five-minute gap after each talk for Q&A.*

- |                |  |
|----------------|--|
| 7:05 - 7:15 pm | Opening Remarks; Heather Desaire and Nick Young  |
| 7:15 - 7:45 pm | <b>Quantitative Analysis of Post-Translational Modifications: From Comprehensive Glycoproteoform Profiles to Targeted Analysis of Kinase Activity;</b> Albert Heck, <i>University of Utrecht</i> |
| 7:50 - 8:20 pm | <b>A PTM Code Regulates the Cystic Fibrosis Ion Transport Regulator (CFTR);</b> John Yates, <i>The Scripps Research Institute</i>  |
| 8:25 - 8:30 pm | About the Asilomar Conference, David Arnott, <i>ASMS Asilomar Committee</i>  |

8:30 - 10:00 pm: **RECEPTION AND POSTERS, Chapel**  
*See Poster List on page 9. Some presenters may not arrive until Saturday.*

## SATURDAY, NOVEMBER 3, 2018

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 - 10:35 am: **DATA ANALYSIS APPROACHES IN PTM QUANTITATION**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 9:00 - 9:30 am     **Proteoforms and Their Families – A New Paradigm for Proteomics?**; Lloyd Smith, *University of Wisconsin*
- 9:35 – 10:05 am     **Detection and Quantitation of Protein Modifications and Sequence Variations by Data Independent Acquisition Mass Spectrometry**; Mike MacCoss, *University of Washington*
- 10:10 - 10:30 am     Hot Topic Talk: **Computational Tools and Innovations in Open Search-Based PTM Discovery and Quantitation**; Andy Kong, *University of Michigan*

10:35 - 10:55 am: **COFFEE BREAK**

10:55 am - 12:05 pm: **PTMs IN SYSTEMS BIOLOGY AND DISEASE**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 10:55 - 11:25 am     Hot Topic Talk: **Identification of >6.200 Serine ADP-Ribosylation Sites Using High-Resolution Quantitative Proteomics Demonstrates that Serine Residues are a Major Target of ADP-Ribosylation**; Michael Lund Nielsen, *Center for Protein Research (Denmark)*
- 11:30 am - 12:00 pm     **Reducing Proteomics: SNO and Phosphorylation Crosstalk**; Jennifer Van Eyk, *Cedars-Sinai Medical Center*

12:05 - 1:00 pm: Asilomar Lunch, *Crocker Dining Hall*  
*Meal ticket required. Offsite lodgers have lunch tickets to pick up with their name badge.*

1:15 - 3:40 pm: **QUANTITATIVE ANALYSIS OF PROTEOFORMS + HOT TOPIC TALK**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 1:15 - 1:45 pm     **Top-down Quantitative Proteomics of Sarcomeric Protein Post-translational Modifications in Disease, Regeneration and Aging**; Ying Ge, *University of Wisconsin-Madison*
- 1:50 - 2:20 pm     **Quantitative Top-Down Proteomics Reveals Proteoform Specific Mechanisms of Gene Regulation**; Nicolas L. Young, *Baylor College of Medicine*
- 2:25 - 2:40 pm     COFFEE BREAK
- 2:40 - 3:10 pm     **High-throughput Quantitative Top-Down Proteomics using Protein-Level Tandem Mass Tag (TMT) Labeling**; Si Wu, *University of Oklahoma*
- 3:15 - 3:35 pm     Hot Topic Talk: **Isotopologue Analysis Offers Improved Analytical Strategy for Paired PTM Analysis and Quantification Protein Turnover**; Thomas Angel, *GlaxoSmithKline*

3:40 - 3:50 pm: **GROUP PHOTO**

3:50 - 6:00 pm: **FREE TIME**

6:00 - 7:00 pm: Asilomar Dinner, *Crocker Dining Hall*  
*Meal ticket required. Offsite lodgers may purchase dinner ticket in the Social Hall.*

**SATURDAY, NOVEMBER 3, 2018, *continued***

7:15 – 7:35 pm: **POSTER HIGHLIGHT TALKS**, *Chapel*  
*Brief five-minute max presentations.*

- 7:15 - 7:20 pm    **Advanced NISTmAb Mass Spectral Reference Libraries for Simultaneous Characterization of Low-Abundance, Highly Complex Posttranslational Modifications in IgG Antibodies**; Qian Dong, *NIST, Gaithersburg, MD* [Poster 5]
- 7:20 - 7:25 pm    **Exploring Proteomics Sample Preparation Methods For Cell Lysate & Plasma**; Aleksandr Gaun, *Calico Labs, South San Francisco, CA* [Poster 9]
- 7:25 - 7:30 pm    **Quantitative phosphoproteomics of chromatin through the cell cycle in *S. pombe***; Andrew Jones, *The Francis Crick Institute, London, United Kingdom* [Poster 11]
- 7:30 - 7:35 pm    **Identification and Validation of Synapse-Loss Regulating Phosphorylation Events in Schizophrenia**; Matthew L MacDonald, *UPMC, Pittsburgh, PA* [Poster 13]

7:35 - 9:30 pm: **INFORMAL MIXER + POSTERS**, *Chapel*  
*See Poster List on page 9*

## SUNDAY, NOVEMBER 4, 2018

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 - 10:35 am: **TECHNOLOGY DEVELOPMENT FOR THE QUANTITATION OF PTMs**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 9:00 - 9:30 am     **Ultraviolet Photodissociation for Mapping Post-Translational Modifications**; Jenny Brodbelt, *University of Texas at Austin*
- 9:35 - 10:05 am     **Identification of Oxidatively Modified Residues for Proteome-Wide Structural Biology**; Lisa Jones, *University of Maryland, Baltimore*
- 10:10 - 10:30 am     Hot Topic Talk: **Quantification of Positionally Isomeric Post Translationally Modified Peptides using Trapped Ion Mobility Spectrometry and PASEF**; Chris Adams, *Bruker Daltonics*

10:35 - 11:00 am: **COFFEE BREAK**

10:55 am - 12:05 pm: **QUANTITATIVE PHOSPHOPROTEOMICS AND SIGNALING NETWORKS**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 10:55 - 11:25 am     **Colon Cancer Phosphoproteomics**; Amanda Hummon, *The Ohio State University*
- 11:30 am - 12:00 pm     **Deconvolving Inter-Animal Heterogeneity in Functional Proteomics Studies**; Forest White, *Massachusetts Institute of Technology*

12:00 - 1:00 pm: Asilomar Lunch, *Crocker Dining Hall*  
*Meal ticket required.*

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: **POSTER HIGHLIGHT TALKS + SPECIAL PRESENTATION**, *Chapel*  
*Brief five-minute max presentations.*

- 7:15 - 7:20 pm     **MODplus: How Fast Can We Identify Real Modifications Using Mass Spectrometry**; Seungjin Na, *Hanyang University, Seoul, South Korea* [Poster 14]
- 7:20 - 7:25 pm     **A Novel Method of Quantifying Protein Methylation Utilizing DIA-MS**; Aaron Robinson, *Cedars Sinai Medical Center, Los Angeles, CA* [Poster 15]
- 7:25 - 7:30 pm     **Improving the Diagnosis, Treatment, and Prevention of Diseases through the Development of a Parathyroid Hormone Mass Spectrometric Reference Measurement Procedure**; Candice Ulmer, *Centers for Disease Control and Prevention, Atlanta, GA* [Poster 17]
- 7:30 - 7:35 pm     **Quantification of Formaldehyde Hemoglobin Adducts in Blood Using Different Calibration Approaches**; Min Yang, *Center for Disease Control, Atlanta, GA* [Poster 19]
- 7:35 - 7:45 pm     **Special Welcome to this evening's reception sponsored by Waters Corporation**, Roy Martin

7:45 - 9:30 pm: **POSTERS + INFORMAL MIXER**, *Chapel*  
*See Poster List on page 9*

Special thanks to this year's Asilomar Conference Sponsor  
**Waters Corporation**

## MONDAY, NOVEMBER 5, 2018

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 - 10:35 am: **GLYCOSYLATION + HOT TOPIC TALK**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 9:00 - 9:30 am     **Sweetening the Process of Biomarker Discovery in Alzheimer's Disease: Development of Improved Chemical Strategies for Probing Glycosylation Pattern Changes in AD**; Lingjun Li, *University of Wisconsin - Madison*
- 9:35 - 10:05 am     **Effective Mass Spectrometry-Based Methods for Global Analysis of Protein Glycosylation**; Ronghu Wu, *Georgia Institute of Technology*
- 10:10 - 10:30 am     Hot Topic Talk: **Histidine Phosphorylation: A New Dimension in the Phosphoproteome**; Simone Lemeer, *University of Utrecht*

10:35 – 10:55 am: **COFFEE BREAK**

10:55 am - 12:05 pm: **LATE MORNING SESSION** *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 10:55 - 11:25 am     **Data Analysis Approaches in PTM Quantitation**; Heather Desaire, *University of Kansas*
- 11:30 am - 12:00 pm     **Automation of PTM Antibody Enrichment Protocols**; Matthew Stokes, *Cell Signaling Technologies*

12:05 - 1:00 pm: Asilomar Lunch (all attendees), *Crocker Dining Hall*  
*Meal ticket required.*

1:15 - 3:45 pm: **EXOTIC PTMs + HOT TOPIC TALK**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 1:15 - 1:45 pm     **High Throughput Methods to Study Cysteine PTMs in Alzheimer's Disease**; Renā Robinson, *Vanderbilt University*
- 1:50 - 2:20 pm     **Protein ADP-Ribosylation: Identification, Quantification and Functional Characterization**; Yonghao Yu, *UT Southwestern Medical Center*
- 2:25 - 2:45 pm     COFFEE BREAK
- 2:45 - 3:15 pm     **Paving the Road to 100,000 Western Blots**; Donald Kirkpatrick, *Genentech*
- 3:20 - 3:40 pm     Hot Topic Talk: **Rapid, Sensitive and Quantitative Phosphoproteomics for Large-Scale Cell Perturbation Analysis**; Jesper Olsen, *NNF Center for Protein Research (Denmark)*

3:45 - 6:00 pm: **FREE TIME**



## MONDAY, NOVEMBER 5, 2018, *continued*

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

7:15 - 8:25 pm: **CLOSING SESSION**, *Chapel*  
*There is a five-minute gap after each talk for Q&A.*

- 7:15 - 7:45 pm    **Profiling and Quantification of Glycoprotein and Glycopeptide PTMs**; Cathy Costello, *Boston University School of Medicine*
- 7:50 - 8:20 pm    **How Can Proteoforms Assist in the Functional Assignment of PTMs?**; Neil Kelleher, *Northwestern University*
- 8:20 - 8:25 pm    Closing Remarks from Heather Desaire and Nick Young

8:25 - 10:00 pm: **BONFIRE! S'MORES + DRINKS**  
*Protected Firepit Area near Crocker Dining Hall. Weather and wind dependent.*

## TUESDAY, NOVEMBER 6, 2018

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.

*Departures at Leisure*

## POSTERS

*All posters will be displayed during the conference. Presenting authors are invited to attend their posters during the evening mixers Friday, Saturday, and Sunday.*

*Several of the posters are also featured in the Saturday and Sunday evening Poster Highlight sessions.*

- 1      **Quantifying competition among mitochondrial protein acylation events induced by ethanol metabolism;** Hadi Ali, *University of Colorado Denver, Aurora, CO*
- 2      **Comparison of Synthetic and Real Intact Protein Mass Spectra;** Marshall W. Bern, *Protein Metrics, San Carlos, CA*
- 3      **nanoLC/MS/MS Profiling of Advanced Glycation End Products (AGE) PTM on MHC-II molecules and Related Antigen Processing Machinery in Diabetes;** Cristina Clement, *Albert Einstein CollegeMed, Bronx, NY*
- 4      **Identification of Microorganism by MALDI-TOF MS, in Paraffin-Wax Embedded Section of Skin, Soft Tissue and Bone of Diabetes Mellitus Patients;** Barbara Dominiak, *Temple University, Philadelphia, PA*
- 5      **Advanced NISTmAb Mass Spectral Reference Libraries for Simultaneous Characterization of Low-Abundance, Highly Complex Posttranslational Modifications in IgG Antibodies;** Qian Dong, *NIST, Gaithersburg, MD*
- 6      **Characterization of Phosphorylation of the C-Terminal Domain of RNA Polymerase II Using UVPD;** Edwin Escobar, *University of Texas at Austin, Austin, TX*
- 7      **Isobaric Multiplex Reagents for Carbonyl Containing Compound (SUGAR) High-Throughput Quantitative MS Analysis;** Yu Feng, *University of Wisconsin, Madison, Madison, WI*
- 8      **A multiplexed enrichment and targeted PRM platform for absolute quantitation of AKT/mTOR, Ras, and p53 signaling pathway targets;** Aaron Gajadhar, *Thermo Scientific, San Jose, CA*
- 9      **Exploring Proteomics Sample Preparation Methods For Cell Lysate & Plasma;** Aleksandr Gaun, *Calico Labs, South San Francisco, CA*
- 10     **Streamlined Middle-Down Quantitation of Histone H3 Proteoforms;** Matthew Holt, *Baylor College of Medicine, Houston, TX*
- 11     **Quantitative phosphoproteomics of chromatin through the cell cycle in *S. pombe*;** Andrew Jones, *The Francis Crick Institute, London, United Kingdom*
- 12     **Mass Spectrometry Based Analysis of Tau Post-translational Modifications in Aging;** Shannon Leslie, *Yale University, New Haven*
- 13     **Identification and Validation of Synapse-Loss Regulating Phosphorylation Events in Schizophrenia;** Matthew L MacDonald, *UPMC, Pittsburgh, PA*
- 14     **MODplus: How Fast Can We Identify Real Modifications Using Mass Spectrometry;** Seungjin Na, *Hanyang University, Seoul, South Korea*
- 15     **A Novel Method of Quantifying Protein Methylation Utilizing DIA-MS;** Aaron Robinson, *Cedars Sinai Medical Center, Los Angeles, CA*
- 16     **Software-based Analysis of Chemical Modifications in Therapeutic Antibody CDRs, and Verification of Isospartate Residues by MALDI MS and Post-Source Decay;** John Robinson, *Discovery Attribute Sciences, Amgen Inc., Thousand Oaks, CA*
- 17     **Improving the Diagnosis, Treatment, and Prevention of Diseases through the Development of a Parathyroid Hormone Mass Spectrometric Reference Measurement Procedure;** Candice Ulmer, *Centers for Disease Control and Prevention, Atlanta, GA*
- 18     **Quantitative top-down Proteomics reveals that SMYD3 regulates H4K20me3 in Proteoform Specific Manner;** Tao Wang, *Baylor College of Medicine, Houston, TX*
- 19     **Quantification of Formaldehyde Hemoglobin Adducts in Blood Using Different Calibration Approaches;** Min Yang, *Center for Disease Control, Atlanta, GA*
- 20     **A Mass Spectrometric Method for the Detection and Quantitation of Symmetric and Asymmetric Dimethylation of Arginine Sites;** Francesca Zappacosta, *GlaxoSmithKline, Collegeville, PA*

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THERE ARE

# THREE DIMENSIONS OF RESOLUTION.

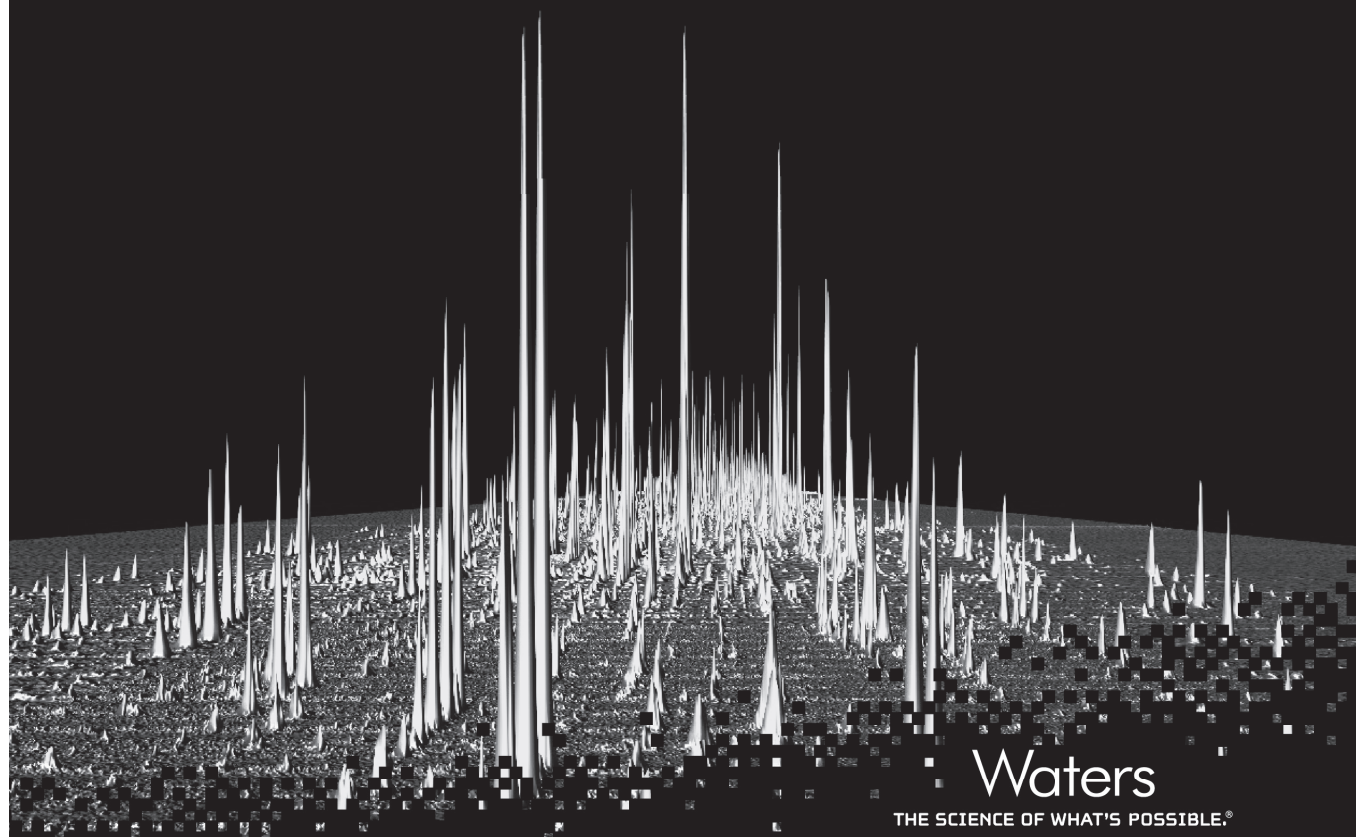
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