

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Natural Products and Synthetic Biology: Parts and Pathways (J1)

January 21-24, 2018 • Resort at Squaw Creek • Olympic Valley, California, USA

Scientific Organizers: Jon Clardy, Yi Tang and Sean F. Brady

Supported by the Directors' Fund

Abstract & Scholarship Deadline: September 25, 2017 / Abstract Deadline: October 23, 2017 / Discounted Registration Deadline: November 21, 2017

### SUNDAY, JANUARY 21

#### Arrival and Registration

### MONDAY, JANUARY 22

#### Welcome and Keynote Address

**Christian Hertweck**, Leibniz Institute for Natural Product Research and Infection Biology, Germany  
*Neglected Microbes and Cryptic Pathways*

#### Mining the Human Microbiome

**Michael A. Fischbach**, University of California, San Francisco, USA  
*Small Molecules from the Human Microbiota*

**Emily P. Balskus**, Harvard University, USA  
*Discovering Chemistry from the Human Microbiota*

**Jason M. Crawford**, Yale University, USA  
*Secondary Metabolic Pathway-Targeted Metabolomics*

#### Short Talk(s) Chosen from Abstracts

#### Mining Environmental Genomes

**Sean F. Brady**, Rockefeller University, USA  
*Culture-Independent Discovery of Natural Products from Soil Metagenomes*

**Jon Clardy**, Harvard Medical School, USA  
*Origin of Chemical Diversity in the Fungus-Growing Ant Symbiosis*

**Bradley Moore**, University of California, San Diego, USA  
*Unusual Flavoenzymes Catalysis in Marine Bacteria*

#### Short Talk Chosen from Abstracts

#### Poster Session 1

### TUESDAY, JANUARY 23

#### Fungal and Plant I

**Sarah O'Connor**, John Innes Centre, UK  
*Biocatalysts from Alkaloid Producing Plants*

**Elizabeth Sattely**, Stanford University, USA  
*The Chemical Logic of Plant Natural Product Biosynthesis*

**Reshma Shetty**, Ginkgo Bioworks, Inc., USA  
*Custom Organism Design*

**Alessandra S. Eustaquio**, University of Illinois, USA  
*Bacterial Genome Mining and Biosynthetic Engineering for Natural Product Drug Discovery and Development*

#### Short Talk(s) Chosen from Abstracts

#### Fungal and Plant II

**Yi Tang**, University of California, Los Angeles, USA  
*Complexity Generation during Natural Product Biosynthesis Using Redox Enzymes*

**Nancy P. Keller**, University of Wisconsin, USA  
*Natural Products serve in Arms War Race between Fungi and Bacteria*

**Sunil Chandran**, Amyris Biotechnologies, USA  
*Building Biological Factories for Renewable and Sustainable Products*

**Chaitan S. Khosla**, Stanford University, USA

*Structure and Mechanism of Assembly Line Polyketide Synthases*

#### Poster Session 2

### WEDNESDAY, JANUARY 24

#### Plant and Other Pathways

**Christina D. Smolke**, Stanford University, USA  
*A Microbial Biomanufacturing Platform for Natural and Semisynthetic Opioids*

**Anne E. Osbourn**, John Innes Centre, UK  
*Plant Metabolic Clusters – From Genetic to Genomics*

**Francis Stewart**, Technische Universitaet Dresden, Germany  
*Direct Cloning and Recombineering of Biosynthetic Gene Clusters*

#### Short Talk(s) Chosen from Abstracts

#### Microbial Pathways

**Axel A. Brakhage**, Friedrich Schiller University Jena, Germany  
*Genome-Based Refactoring of Fungal Natural Product Biosynthesis Pathways by Synthetic Biology*

**Christopher Voigt**, Massachusetts Institute of Technology, USA  
*Synthetic Biology to Access and Expand Nature's Chemical Diversity*

**Jaclyn Winter**, University of Utah, USA  
*Fungal Natural Products: Elucidating the Biosynthesis of the Good, the Bad and the Unknown*

#### Meeting Wrap-Up: Outcomes and Future Directions (Organizers)

### THURSDAY, JANUARY 25

#### Departure