

## PACIFIC SYMPOSIUM ON BIOCOMPUTING 2016

2016 marks the 21st Pacific Symposium on Biocomputing (PSB)! This is an exciting time for Biocomputing—there are now a diversity of terms associated with the use of computer science, statistics and informatics to solve problems in biology and medicine. Most recently, we have seen a rise in the use of the term “biomedical data science.” In the US, the National Institutes of Health (NIH) has recognized the importance of biomedical data science with the appointment in 2014 with Phil Bourne as Associate Director for Data Science. Don Lindberg recently stepped down as the Director of the National Library of Medicine (NLM). The NLM is a long-time supporter of biomedical data science (including biomedical informatics, clinical informatics, and bioinformatics). We are grateful that NLM regularly has supported PSB as well. This summer, an NIH working group wrote a vision for the future of NLM that calls for it to be the “epicenter of data science at NIH.” All these developments are good for the field—which has evolved from a niche activity among (visionary) investigators to a mission-critical effort in support of biological and medical science. While some are worried about shifting labels (biocomputing, biomedical informatics, biomedical data science, etc.), the core challenges to the field remain the same, and the new labels simply reflect the influx of new talent and the need periodically for some rebranding. We are comfortable with the large umbrella and the legacy of the term “biocomputing.” There are no plans to rename PSB!

The mission of PSB is to provide a forum for the best *emerging* science in Biocomputing, providing both formal and informal mechanisms for scientific communication—with an emphasis on work in the pacific rim. PSB depends on the community to define emerging areas in biomedical computation. Its sessions are usually conceived at the previous PSB meeting as people discuss trends and opportunities for new science. The typical program includes sessions that evolve over two to three years as well as entirely new sessions. This year we revisit new dimensions of precision medicine (which continues to advance at dazzling speed since the announcement of the US Precision Medicine Initiative by President Obama at the State of the Union address), and add new sessions on reproducibility and social media.

In addition to being published by World Scientific and indexed in PubMed, the proceedings from all PSB meetings are available online at <http://psb.stanford.edu/psb-online/>. PSB has published more than 800 papers. These papers are often cited in journal articles and represent early contributions in emerging subfields—many times before there is an established literature in more traditional journals; for this reason, many papers have garnered hundreds of citations. The Twitter handle PSB 2016 is @PacSymBiocomp and the hashtag this year will be #psb16.

The efforts of a dedicated group of session organizers have produced an outstanding program, including introductory tutorials. The sessions of PSB 2016 and their hard-working organizers are as follows:

### **Discovery of Molecularly Targeted Therapies**

Philip R.O. Payne, Kun Huang, Nigam Shah

### **Innovative Approaches to Combining Genotype, Phenotype, Epigenetic, and Exposure Data for Precision Diagnostics**

Melissa Haendel, Nicole Washington, Maricel Kann

### **Methods to Enhance the Reproducibility of Precision Medicine**

Arjun Manrai, Chirag Patel, Nils Gehlenborg, Nicholas Tatonetti, John Ioannidis, Isaac Kohane

### **Precision Medicine: Data and Discovery for Improved Health and Therapy**

Bruce Aronow, Steven Brenner, Sean Mooney, Alexander Morgan

### **Regulatory RNA**

Drena Dobbs, Steven Brenner, Robert Jernigan, Alain Laederach, Vasant Honavar, Quaid Morris

### **Social Media Mining for Public Health Monitoring and Surveillance**

Graciela Gonzalez, Matthew Scotch, Karen Smith, John Brownstein, Abeed Sarker, Michael Paul, Azadeh Nikfarjam

We are also pleased to present five workshops in which investigators with a common interest come together to exchange results and new ideas in a format that is more informal than the peer-reviewed sessions. For this year, the workshops and their organizers are:

**Computational Approaches to Study Microbes and Microbiomes**

Casey Greene, James Foster, Bruce Stanton, Deborah Hogan, Yana Bromberg

**Biomedical Applications of Topology and Abstract Algebras**

Eric Neumann, Svetlana Lockwood, David Spivak, Bala Krishnamoorthy

**Use of Genome Data in Newborns as a Starting Point for Life-Long Precision Medicine**

Steven E. Brenner and Sean D. Mooney

**Translational Bioinformatics 101**

Jessica D. Tenenbaum, Subha Madhavan, Robert Freimuth, Josh Denny, Lewis Frey

**Social Media Mining Shared Task Workshop**

Graciela Gonzalez, Abeer Sarker, and Azadeh Nikfarjam

We thank our keynote speakers Nancy Cox (Science keynote) and Winter Mason (Ethical, Legal and Social Implications keynote).

Tiffany Murray has managed the peer review process and assembly of the proceedings since 2003, and also plays a key role in many other aspects of the meeting. We are grateful for the support of the Institute for Computational Biology, a collaborative effort of Case Western Reserve University, the Cleveland Clinic Foundation, and University Hospitals their support of PSB 2016. We also thank the National Institutes of Health, the National Science Foundation, and the International Society for Computational Biology (ISCB) for travel grant support. We are particularly grateful to the onsite PSB staff Al Conde, Brant Hansen, Georgia Hansen, BJ Morrison-McKay, Jackson Miller, Kasey Miller, and Paul Murray for their assistance. We also acknowledge the many busy researchers who reviewed the submitted manuscripts on a very tight schedule. The partial list following this preface does not include many who wished to remain anonymous, and of course we apologize to any who may have been left out by mistake.

We look forward to a great meeting once again. Aloha!

Pacific Symposium on Biocomputing Co-Chairs,  
October 15, 2015

**Russ B. Altman**

*Departments of Bioengineering, Genetics & Medicine, Stanford University*

**A. Keith Dunker**

*Department of Biochemistry and Molecular Biology, Indiana University School of Medicine*

**Lawrence Hunter**

*Department of Pharmacology, University of Colorado Health Sciences Center*

**Teri E. Klein**

*Department of Genetics, Stanford University*

**Marylyn D. Ritchie**

*Department of Biochemistry and Molecular Biology, Pennsylvania State University*

**Thanks to the reviewers...**

Finally, we wish to thank the scores of reviewers. PSB aims for every paper in this volume to be reviewed by three independent referees. Since there is a large volume of submitted papers, paper reviews require a great deal of work from many people. We are grateful to all of you listed below and to anyone whose name we may have accidentally omitted or who wished to remain anonymous.

Zach Abrams	Tudor Groza	Arjun Manrai
Denis Agniel	Melissa Haendel	Dan Masys
Shandar Ahmad	Hao Han	Sergio Matos
Frank Albert	Xu Han	Shannon McWeeney
Dvir Aran	Zhi Han	Tom Metz
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Olivier Bodenreider	Gabriel Hoffman	Azadeh Nikfarjam
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Binghuang Cai	Lei Huang	Gustavo Parisi
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Shahim Essaid	Yue Li	Arash Shaban-Nejad
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