

## PACIFIC SYMPOSIUM ON BIOCOMPUTING 2021

2021 marks the 26th Pacific Symposium on Biocomputing (PSB). Unfortunately, circumstances surrounding the Covid-19 pandemic prevent us from gathering together on the Big Island to engage in the traditional scientific sessions, invited lectures, workshops and collegiality-by-the-beach (and pool) that has become the hallmark of PSB. Fortunately, we still received very high-quality submissions and these will be presented virtually and allow continued (socially distanced) interaction and scientific exchange. We are also arranging virtual workshops and a virtual poster session. We have shortened the total length of the meeting, to help participants avoid “zoom fatigue” but many of the presentations will be recorded and available, so the reach and impact of the meeting may in some ways be extended.

Covid-19 has changed life on earth in 2020 in ways that few of us could have imagined. Many of the most basic life and work practices and assumptions have been challenged. The biomedical informatics, bioinformatics and computational biology communities have played a special role in contributing to the fight against the virus. While many of our experimental colleagues had to shut down their labs for weeks to months during the pandemic, many computational labs were able to continue their work with access to their computing facilities and a move to virtual meetings. There are many examples of early contributions to understanding the biology of the SARS-Cov-2 virus based on computational analysis of its genome, epitope targets for vaccine development, and its proteome and connections to the host. In addition, the tsunami of publications (particularly preprints) has created challenges in automatic understanding and integration (and triage) of scientific findings, in order to help scientists track the rapidly evolving landscape of our understanding of the virus. Finally, there have been opportunities in tracking population health and the delivery of clinical care—in many cases, informatics technologies have helped decision makers understand the details of the pandemic, and how best to deploy resources. At the same time, the pandemic has exposed weaknesses in our health information infrastructure—for both communicating health data, storing it, integrating it and analyzing it. For example, computational researchers who may have never sent or received a fax (!) are now trying to help figure out how to automate their analysis (many Covid-19 case reports are still faxed to local health departments) and ensure that they are soon replaced as first-line communication methods. There are also great challenges in modeling the pandemic and its impacts on health and the economy. Never before have analytic and computational capabilities in biology and medicine been so important. So, we persevere under difficult circumstances to continue the mission of PSB to bring scientists together as they approach some of the most challenging and important problems.

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 1227 papers listed in PubMed (as of today). These papers are routinely cited in archival journal articles and often represent important early contributions in new 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 2021 is @PacSymBiocomp and the hashtag this year will be #psb21.

The efforts of a dedicated group of session organizers have produced an outstanding program. The sessions of PSB 2021 and their hard-working organizers are as follows:

### **[Advanced Methods for Big Data Analytics in Women's Health](#)**

Organizers: Graciela Gonzalez-Hernandez, Karin Verspoor, Maricel G. Kann, Su Golder, Lisa Levine, Mary Regina Boland, Natalia Villanueva-Rosales, Karen O'Connor

### **[Achieving Trustworthy Biomedical Data](#)**

Organizers: Dennis Wall, Nicholas Tatonetti, Jan Liphardt, Bethany Percha, Serena Yeung, Peter Washington

### **[Pattern Recognition in Biomedical Data for Discovery](#)**

Organizers: Brett Beaulieu-Jones, Christian Darabos, Dokyoon Kim, Shilpa Kobren, Anurag Verma

### [What about the environment? Leveraging multi-omic datasets to characterize the environment's role in human health](#)

Organizers: Kristin Passero, Shefali Setia Verma, Kimberly McAllister, Arjun Manrai, Chirag Patel, Molly A. Hall

### [Biocomputing and AI for infectious disease modelling and therapeutics](#)

Organizers: Gil Alterovitz, Wei-Lun Alterovitz, Gail H. Cassell, Lixin Zhang, A. Keith Dunker

### [Computational Challenges and Artificial Intelligence in Precision Medicine](#)

Organizers: Olga Afanasiev, Joanne Berghout, Steven Brenner, Martha L. Bulyk, Dana Crawford, Jonathan H. Chen, Roxana Daneshjou, Łukasz Kidziński

We are also pleased to present four 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:

### [Bioinformatics of Corals](#)

Organizers: Lenore J. Cowen, Judith Klein-Seetharaman, Hollie Putnam

### [Translational Bioinformatics](#)

Organizers: Jason Moore, Ju Han Kim, Dokyoon Kim

### [Making Tools that People Will Use: User-Centered Design in Computational Biology Research](#)

Organizers: Mary Goldman, Nils Gehlenborg

### [Raising the Stakeholders: Improving Patient Outcomes Through Interprofessional Collaborations in AI for Healthcare](#)

Organizers: Carly A. Bobak, Kristine A. Giffin, Marek Svoboda, Jason Moore, Dennis P. Wall

### [Establishing the Reliability of Algorithms in Biomedical Informatics](#)

Organizers: Lara Mangravite, Sean Mooney, Iddo Freidberg, Justin Guinney

Tiffany Murray has managed the peer review process and assembly of the proceedings since 2001 and plays a key role in many aspects of the meeting. We are grateful for the support of the National Institutes of Health<sup>1</sup>. The Research Parasite Awards benefit from support from GigaScience, Jeff Stibel, Mr. and Mrs. Stephen Canon, and Drs. Casey and Anna Greene. The Research Symbiont Awards benefit from support from the Wellcome Trust, Springer-Nature and the DragonMaster Foundation.

We are particularly grateful to the PSB staff Cynthia Paulazzo and Ryan Whaley 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 virtual meeting and very much hope to see you all again on the Big Island in 2022. Aloha!

Pacific Symposium on Biocomputing Co-Chairs,  
October 8, 2020

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### 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.

Abubakar Abid	Graciela Gonzalez-Hernandez	Maya Ramchandran
Rocky Aikens	Molly Hall	David Rhoiney
Tatsuya Akutsu	Jie Hao	Pedro Romero
Wei-Lun Alterovitz	Bryan He	Daniel Rotroff
Raquel Aoki	Ting Hu	Max Salfinger
Brittany Baur	Tai-huang Huang	Indra Neil Sarka
Amber Beitelshes	Hyungsoon Im	Jacob Schreiber
Mary Regina Boland	Alokkumar Jha	Alejandro Schuler
Nicolas Buchler	Mingon Kang	Lulu Shang
Sophie Burkhardt	Lukasz Kidzinski	Li Shen
Laura Cao	Benjamin Kompa	Masaki Shimomura
Nyasha Chambwe	Dhireesha Kudithipudi	Kyung-Ah Sohn
Ed Chan	Chirag Lakhani	Yosuke Tanigawa
Tianchi Chen	Avantika Lal	Ling Teng
Xiangyin Chen	Jerry Lee	Elizabeth Torres
Yu Wai Chen	Tom Lenaerts	Anna Tyler
Abu Chowdhury	Lisa Levine	Martie VanderWalt
Evan Cofer	Joshua Levy	Karin Verspoor
Jessica Cooke Bailey	Li Li	Kailas Vodrahalli
Dana Crawford	Pinghua Liu	Jennifer Wagner
Sara Cromer	David Magnus	Haohan Wang
Gargi Datta	Bill Majoros	Yixin Wang
Devendra Singh Dhami	Dmitry Maslov	Jennifer Williams
Alexander D. Diehl	Magdalena Matusiak	Kevin Wu
Jessilyn Dunn	Jason Miller	Jeff Xia
Jason Ernst	Riccardo Miotto	Eva Zhang
Nicole Ferraro	Elias Chaibub Neto	Lixin Zhang
Noah R. Flynn	Karen O'Connor	Ren Zhiyun
Juan Fuxman Bass	Chris Oldfield	Xinxin (Katie) Zhu
Ethan Garner	Andrew Patterson	Marinka Zitnik
Mario Giacobini	Vivek Philip	
Benjamin Glicksberg	Vasiliki Nataly Rahimzadeh	