

**5th International Conference on the
Foundations of Systems Biology in Engineering
FOSBE 2015**

Robert S. Parker, Chair (University of Pittsburgh)
Michael A. Henson, co-Chair (University of Massachusetts, Amherst)
Juergen Hahn, co-Chair (Rensselaer Polytechnic Institute)
Ty Thomson, co-Chair (Selventa, Inc.)
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The 5th FOSBE conference was held August 9-12 at the Royal Sonesta Boston, in, Cambridge, Massachusetts. The conference was sponsored by CACHE, with IFAC co-sponsorship from Biosystems and Bioprocesses (TC 8.4) and Biological and Medical Systems (TC 8.2). 72 participants from 8 countries met for the event; approximately 6% of participants were from industry and more than 20% were from countries outside the U.S. The meeting opened with a welcome reception Sunday evening, which was followed by **Prof. Pamela Silver**, Harvard University, delivering the conference-opening lecture, “Designing Biology for a Healthy World”.

The Monday program started with our keynote lecture, “Life Redesigned: The Emergence of Synthetic Biology”, from synthetic biology pioneer, **Prof. James Collins** of MIT. The synthetic biology theme continued into the morning session, which included talks from **Prof. Ron Weiss** (MIT), **Dr. Nate Tedford** (Ginkgo Bioworks), and **Prof. Cynthia Collins** (Rensselaer Polytechnic Institute). The first of two poster sessions took place over lunch (more details below). Undergraduate systems biology education, presented by **Prof. Adele Doyle** (University of California, Santa Barbara), started the Monday afternoon session, which then transitioned to systems biology methods talks from **Prof. Rudi Gunawan** (ETH) and **Prof. Masaru Tomita** (Keio University). Conference participants were given Monday evening to enjoy Cambridge and Boston.

Tuesday morning focused on translational science, with systems medicine as the theme. **Prof. Ipsita Banerjee** (University of Pittsburgh), **Prof. Kyongbum Lee** (Tufts University), **Prof. Jens Timmer** (University of Freiburg), and **Prof. Rolf Findeisen** (Otto-von-Guericke University Magdeburg) were the speakers. At mid-day, posters were again presented alongside lunch. The Tuesday afternoon session focused on cell signaling and included presentations from **Prof. Francis J. Doyle III** (Harvard University), **Prof. Gregory Buzzard** (Purdue), and **Prof. Juergen Hahn** (Rensselaer Polytechnic Institute).

The **Founders Award** recognizes an individual who has made pioneering contributions to engineering approaches in systems biology. The 2015 Founders Award was presented to **Prof. Bernhard Palsson**, of the University of California, San Diego. His award talk was entitled, “Genome-Scale Models Can Compute Proteome Allocation”, which provided historical perspective, and glimpses of a potential future, in systems biology, while highlighting key insights derived from understanding biology across multiple scales from genes to systems. Tuesday evening ended with the conference banquet.

Wednesday began with talks from **Mr. Andreas Gyorgy** (MIT; **Prof. Domitilla Del Vecchio's** lab), **Prof. Radhakrishnan Mahadevan** (University of Toronto), and **Mr. Anupam Chowdhury** (Penn State University; **Prof. Costas Maranas'** lab) in the area of microbial metabolic networks. A brief lunch break was followed by the cell populations session, which included talks from **Prof.**



Prof. Bernhard Palsson's Founders Award Lecture

Daniel Segrè (Boston University), **Prof. Michael Henson** (University of Massachusetts, Amherst), and **Prof. Frank Allgöwer** (University of Stuttgart).

47 Contributed papers, selected from 66 submissions, were presented in two poster sessions during the meeting. The first FOSBE student poster competition was coordinated by **Prof. Neda Bagheri** (Northwestern University) and **Prof. Stephanie Taylor** (Colby College), who evaluated the presenters for technical and presentation quality. The final selection of winners was made difficult by the overall quality of work done by the students. Poster awards were given to **Mr. Marc Martin-Casas** (University of California, Berkeley – first place), **Mr. Matthew Markovetz** (University of Pittsburgh – second place) and **Ms. Kelsey Dean** (Harvard University – third place).

The educational and training mission of the FOSBE meeting was accomplished through an all-day pre-meeting workshop for graduate students, post-doctoral researchers, junior faculty, and industry participants. Talks highlighted a variety of tools and approaches to systems biology research challenges. The workshop faculty included **Profs. Neda Bagheri, Rudi Gunawan, Juergen Hahn, Michael Henson, Babatunde Ogunnaike** (University of Delaware), **Robert Parker, and Jens Timmer**.

The overall quality of the presentations and posters made the 2015 FOSBE meeting an unqualified technical success. We gratefully acknowledge the **Department of Defense Army Research Office** for their generous support. Industrial sponsorship and financial support of the FOSBE meeting was kindly provided by **Amgen, Selventa, and Merrimack**.

Thank you to all FOSBE attendees and supporters for making the 2015 meeting a success. We especially thank **Ms. Robin Craven**, who provided outstanding logistical and organizational support up to and through the conference.

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