

**Keynote 2****Programming Living Cells: Design automation to map circuits to DNA****Speaker****Christopher Voigt**  
*Professor of Biological Engineering at MIT, US***Abstract**

Platforms are being established to facilitate large genetic engineering projects. A desired cellular function is divided into systems that can be developed independently and then combined. Genetic sensors allow cells to receive environmental and cell state information. Sensory information is integrated by genetic circuits, which control the conditions and timing of a response. The circuit outputs are connected to actuators that control what the cell is doing, from building molecules to moving and communicating. Design automation tools from the electronics industry are applied to map a circuit design to a DNA sequence. Collectively, this enables a wide range of applications, for example cells that communicate to build a material, navigate the human body to treat a disease, or protect plants by responding to the environment.

**Biography**

**Christopher Voigt**, PhD is a Professor of Biological Engineering at MIT. He is the Co-Director of the Synthetic Biology Center and co-founder of the MIT-Broad Foundry. He is the Editor-in-Chief of ACS Synthetic Biology. He holds joint appointments at the Broad Institute, Lawrence Berkeley National Labs, Korea Advanced Institute of Science & Technology (KAIST), University of California - San Francisco, and Imperial College. He received his BSE in Chemical Engineering from the University of Michigan (1998) and PhD in Biophysics from Caltech (2002). He is a founder of Pivot Bio (microbial agricultural products) and Asimov (genetic circuit design automation). He has served on the science advisory boards of DSM, Bolt Threads, Pivot Bio, SynLogic, Amyris Biotechnologies, Zymergen, Biomillenia, and Twist Bioscience. He has been honored with a National Security Science & Engineering Faculty Fellowship (NSSEFF), Sloan Fellow, Pew Fellow, Packard Fellow, NSF Career Award, Vaughan Lecturer, MIT TR35, and SynBiobeta Entrepreneurial Leadership Award.