



# 2022 / AIChE ANNUAL MEETING

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November 13-18, 2022  
Phoenix Convention Center  
Phoenix, AZ

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BIOENGINEERING  
USERS GUIDE

➤ POWERING THE FUTURE

## SBE conferences cover the bioengineering field.



SBE conferences bring you the latest developments from fundamental and emerging fields of bioengineering. Connect, collaborate, showcase your work, and expand your horizons.



**December 1-3, 2022 • Heidelberg, Germany • [aiche.org/opto](https://aiche.org/opto)**

This conference will showcase recent advances in optogenetics and will bring together different branches of the optogenetic community. It will include approaches in neuronal and non-neuronal optogenetics as well as in material science and unicellular organisms.



**December 9-11, 2022 • Boston, MA • [aiche.org/microbiome](https://aiche.org/microbiome)**

ICME brings together leaders and experts from academia and industry to discuss progress and needs—to develop research, technology, and innovation in microbiome engineering. Microbial engineers at all levels, from trainees to established researchers, are welcomed to participate.



**December 9-11, 2022 • Fort Lauderdale, FL • [aiche.org/plantsynbio](https://aiche.org/plantsynbio)**

This event brings together scientists and engineers from universities, industry and government working in all aspects of plant synthetic biology, plant bioengineering and plant biotech. It is specifically designed to address innovations and opportunities in these fields.



**December 14-16, 2022 • Boston, MA • [aiche.org/translational](https://aiche.org/translational)**

The conference will provide an in-depth view of innovative and cross-disciplinary biological technologies and will bring together leading scientists focusing on immunoengineering, gene editing, regenerative medicine, biomanufacturing, and biomaterials.



**January 8-11, 2023 • Santa Barbara, CA • [aiche.org/icbe](https://aiche.org/icbe)**

The goal of this meeting is to stimulate discussion to integrate biomolecular approaches across the scales of biological complexity - molecules to cells to entire organisms.

SBE's meeting formats encourage close interactions and discussions between researchers of all expertise levels and disciplines, including faculty, industry program leads, students, post-docs, and industry scientists and engineers.

**Visit [aiche.org/sbe-conferences](https://aiche.org/sbe-conferences) for the complete list of conferences.**

*Event details including dates and locations are subject to change; please check website for most current information.*

# ADD TO YOUR MEMBERSHIP

Established by AIChE, the **Society for Biological Engineering** is a community for engineers and applied scientists integrating biology with engineering.

Be a part of a vibrant community who share your passions.

As a member of SBE, you will enjoy a vast array of opportunities to communicate with leading international engineers, researchers, academics and scientists. Connect for ideas, inspiration, and technical information.



- Gain an international professional network
- Receive discounts on leading biological engineering conferences
- Access first-hand information from academic and industrial experts
- Enjoy SBE's monthly e-newsletter Connections
- Read through a semi-annual BioSupplement to *Chemical Engineering Progress* (CEP)
- Realize a voice in education, employment and technology advancement topics
- Watch webinars featuring cutting edge topics covered by the current experts

**Join today!**

[www.aiche.org/sbe/membership](http://www.aiche.org/sbe/membership)

## Managing Board

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SBE is governed by a Managing Board of industrial and academic leaders, which sets the course for the society.

**Georges Belfort**, *Chair*

**Brian Davison**, *Board Representative*

**Julianne Holloway**, *Board Representative*

**June C. Wispelwey**, *Managing Board, Standing Position*

**Dana Anderson**, *Managing Board*

**William E. Bentley**, *Managing Board*

**Timothy Charlebois**, *Managing Board*

**Gregory Frank**, *Managing Board*

**Michael Jewett**, *Managing Board*

**Paul Mensah**, *Managing Board*

**Todd M. Przybycien**, *Managing Board*

**Gregory Stephanopoulos**, *Managing Board*

# ADD TO YOUR MEMBERSHIP



The **FP&BE** division ("Division 15") provides engineers and scientists interested in the field of food, pharmaceuticals, and bioengineering with places to join and to discuss. It also supplies technical publications and information in these fields, including papers at national Institute meetings.

In addition, the division coordinates the Institute's activities in the fields of food, pharmaceuticals, and bioengineering with the activities of other related societies. Further, the FP&BE encourages the focus of biological sciences in chemical engineering curricula and promotes the application of sanitary design principles for process equipment and installations.

More information at: [www.aiche.org/fpbe](http://www.aiche.org/fpbe)



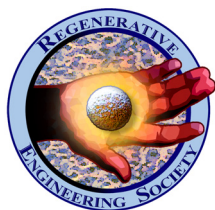
The **Pharmaceutical Discovery, Development and Manufacturing Forum (PD2M)** promotes the interchange of ideas, concepts, know-how, and experiences in Pharmaceutical Discovery, Development and Manufacturing with other groups within and outside of the Institute.

More information at: [www.aiche.org/pd2m](http://www.aiche.org/pd2m)



The **International Metabolic Engineering Society (IMES)** seeks to promote and advance metabolic engineering as an enabling science for bio-based production of materials, pharmaceuticals, food ingredients, chemicals and fuels.

More information at: [www.aiche.org/imes](http://www.aiche.org/imes)



The mission of **The Regenerative Engineering Society** is to promote and advance regenerative engineering, a new field defined as the Convergence of Advanced Materials Sciences, Stem Cell Science, Physics, Developmental Biology and Clinical Translation for the regeneration of complex tissues and organ systems.

More information at: [www.aiche.org/resociety](http://www.aiche.org/resociety)

## FEATURED PROGRAMMING Be sure to attend these conference highlights –

### SUNDAY, NOVEMBER 13, 2022

#### Discussing the 2022 NASEM Report: New Directions for Chemical Engineering

3:00 PM – 4:45 PM

N-124AB, Phoenix Convention Center

### MONDAY, NOVEMBER 14, 2022

#### Regenerative Engineering Society I

8:00 AM - 10:30 AM

Phoenix Convention Center, N-121A

#### Powering the Future: Panel Discussion

11:00 AM – 12:20 PM

N-124AB Phoenix Convention Center

#### Regenerative Engineering Society II

12:30 PM - 3:00 PM

Phoenix Convention Center, N-121A

#### Regenerative Engineering Society III

3:30 PM - 6:00 PM

Phoenix Convention Center, N-121A

#### Pharmaceutical Discovery, Development, and Manufacturing Forum Awards Ceremony

6:15 PM – 8:00 PM

N-123, Phoenix Convention Center

### TUESDAY, NOVEMBER 15, 2022

#### 2022 Andreas Acrivos Award for Professional Progress in Chemical Engineering Lecture

11:15 AM – 12:15 PM

North Ballroom 120D, Phoenix Convention Center

#### Building Microbial Chemical Factories: Design, Assembly, and Engineering of Biological Routes to Chemical Compounds

Kristala L. J. Prather, *Massachusetts Institute of Technology*

#### Division Plenary: Food, Pharmaceutical, and Bioengineering Division

3:30 PM – 6:00 PM

N-129AB, Phoenix Convention Center

#### SBE's James E. Bailey Award Lecture

6:15 PM – 7:00 PM

North Ballroom 120D, Phoenix Convention Center

#### Exploiting Viruses that Kill and Killing Viruses that Exploit: Some Sweet Science

Jonathan Dordick, *Rensselaer Polytechnic Institute*

#### SBE's Hospitality Suite, Sponsored by Pfizer

9:00 PM – 11:00 PM

N-121C, Phoenix Convention Center

Free to SBE members – or join at the door.



### WEDNESDAY, NOVEMBER 16, 2022

#### Plenary Session: Pharmaceutical Discovery, Development and Manufacturing Forum

8:00 AM – 10:30 AM

N-124AB, Phoenix Convention Center

# BIOENGINEERING PROGRAM GRID

**Property Key**  
Phoenix Convention Center = PCC

TIME	SESSION #	SESSION	PROPERTY	ROOM
<b>SUNDAY, NOVEMBER 13</b>				
3:00 PM	3	Discussing the 2022 NASEM Report: New Directions for Chemical Engineering	PCC	N-124AB
3:30 PM	19	Biomolecular Engineering I	PCC	N-126A
3:30 PM	20	Cell and Tissue Engineering: Mechanical Cues and Cell Behavior	PCC	N-126B
3:30 PM	21	Engineering Protein Therapeutics	PCC	N-125A
3:30 PM	23	Systems and Quantitative Biology: Integrative Omics Analysis	PCC	N-125B
3:30 PM	27	Biomaterials and Life Sciences Eng: Faculty Candidates I	PCC	N-122B
3:30 PM	28	Biomaterials I: Biomaterials for Infection, Wound, and/or Disease Treatment	PCC	N-121A
3:30 PM	29	Biomaterials in Industry and the Clinic	PCC	N-121C
3:30 PM	32	Applied Formulation Design in Drug Product	PCC	N-123
3:30 PM	33	Predictive Scale-Up/Scale-Down for Production of Pharmaceuticals and Biopharmaceuticals I	PCC	N-122C
<b>MONDAY, NOVEMBER 14</b>				
8:00 AM	58	Biomolecular Engineering II	PCC	N-126A
8:00 AM	59	Cell and Tissue Engineering: Engineering the Immune Response	PCC	N-126B
8:00 AM	61	New Methods in Protein Engineering	PCC	N-125A
8:00 AM	62	Systems and Quantitative Biology: Modeling Biological Processes	PCC	N-125B
8:00 AM	67	Fundamental Interactions of Microbes and Microbial Communities with Materials*	PCC	N-222A
8:00 AM	72	Biomaterials and Life Sciences Eng: Faculty Candidates II	PCC	N-121B
8:00 AM	73	Biomaterials II: Biomaterials for Controlling Cell Behavior	PCC	N-122A
8:00 AM	81	Enabling Technologies: Drug Substance and Drug Product Manufacturing	PCC	N-123
8:00 AM	82	Predictive Scale-Up/Scale-Down for Production of Pharmaceuticals and Biopharmaceuticals II	PCC	N-122C
8:00 AM	84	Regenerative Engineering Society I	PCC	N-121A
8:00 AM	89	Medical Devices*	PCC	N-126C
8:00 AM	92	Sensors and Monitoring for Health	PCC	N-231A
11:00 AM	93	Powering the Future: Panel Discussion	PCC	N-124AB
11:15 AM	94	2022 Danckwerts Lecture	PCC	North Ballroom 120D
12:30 PM	117	Biocatalysis and Enzyme Engineering	PCC	N-125A
12:30 PM	118	Biomolecular Engineering III	PCC	N-126A

*This program is as of October 6, 2022. An up-to-date program is available at [aiche.org/annual](https://www.aiche.org/annual) and in the AIChEvents app.*

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TIME	SESSION #	SESSION	PROPERTY	ROOM
12:30 PM	119	Cell and Tissue Engineering: Engineering 3D Tissues to Model Disease and Development	PCC	N-126B
12:30 PM	120	Computational and systems biology tools for metabolic engineering and cell characterization	PCC	N-125B
12:30 PM	125	Technologies for Understanding Microbial Interactions*	PCC	N-222A
12:30 PM	128	Area Plenary: Leaders in Biomaterials (Invited Talks)	PCC	N-121B
12:30 PM	138	Control Strategies in Pharmaceutical Development and Manufacturing I	PCC	N-122C
12:30 PM	139	Enabling Technologies: Progress in Tools and Technologies	PCC	N-123
12:30 PM	142	Regenerative Engineering Society II	PCC	N-121A
12:30 PM	153	Chemical Engineering Principles Advancing Medicine I*	PCC	N-126C
3:30 PM	164	Poster Session: Bioengineering	PCC	Exhibit Hall E
3:30 PM	165	Poster Session: Engineering Fundamentals in Life Science	PCC	Exhibit Hall E
3:30 PM	168	Poster Session: Materials Engineering & Sciences (O8B - Biomaterials)	PCC	Exhibit Hall E
3:30 PM	172	Poster Session: Pharmaceutical Discovery Development and Manufacturing (PD2M)*	PCC	Exhibit Hall E
3:30 PM	207	Control Strategies in Pharmaceutical Development and Manufacturing II	PCC	N-122C
3:30 PM	208	Enabling Technologies: Mechanistic and statistical modeling	PCC	N-123
3:30 PM	210	Regenerative Engineering Society III	PCC	N-121A
3:30 PM	219	Chemical Engineering Principles Advancing Medicine II	PCC	N-126C
<b>TUESDAY, NOVEMBER 15</b>				
8:00 AM	238	In Honor of the 2021 Recipient of the Warren K. Lewis Award - Nicholas Peppas - Part I (Invited Talks)*	PCC	W-105A
8:00 AM	250	Advances in Biocatalysts and Biocatalytic Processes	PCC	N-125A
8:00 AM	251	Biomolecular Engineering and the Immune System	PCC	N-126A
8:00 AM	252	Cell and Tissue Engineering: Engineering in Aging and Aging Associated Diseases	PCC	N-126B
8:00 AM	253	Food, Pharmaceutical & Bioengineering Faculty Candidates Session I	PCC	N-125B
8:00 AM	261	Biomaterial Scaffolds for Tissue Engineering I	PCC	N-122B
8:00 AM	262	Biomaterials: Graduate Student Award Session	PCC	N-121C
8:00 AM	272	Continuous Processing in Drug Substance: Modelling & Simulation	PCC	N-123
8:00 AM	273	Facilities of the Future (Invited Talks)	PCC	N-122C
8:00 AM	284	Big Data and Machine Learning to Advance Medicine*	PCC	N-126C
11:15 AM	290	Andreas Acrivos Award for Professional Progress in Chemical Engineering Lecture	PCC	North Ballroom 120D

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# BIOENGINEERING PROGRAM GRID

TIME	SESSION #	SESSION	PROPERTY	ROOM
12:30 PM	303	In Honor of the 2021 Recipient of the Warren K. Lewis Award - Nicholas Peppas - Part II (Invited Talks)*	PCC	W-105A
12:30 PM	314	Computational, Structure, Biophysical Protein Engineering	PCC	N-125A
12:30 PM	315	Drug Delivery	PCC	N-126A
12:30 PM	316	Food, Pharmaceutical & Bioengineering Faculty Candidates Session II	PCC	N-125B
12:30 PM	317	Stem Cells and Tissue Engineering	PCC	N-126B
12:30 PM	325	Biomaterial Scaffolds for Tissue Engineering II	PCC	N-122B
12:30 PM	326	Biomimetic Materials I	PCC	N-121C
12:30 PM	336	Continuous Processing in Drug Substance: Advancements in Industry	PCC	N-123
12:30 PM	337	Integrated Product and Process Design with Pharmaceutical Applications I	PCC	N-122C
12:30 PM	340	Advances in Bioseparations*	PCC	N-130
12:30 PM	348	Pandemic Response and Public Health*	PCC	N-126C
1:00 PM	357	Meet the Industry Candidates Poster Session: Pharmaceutical Discovery, Development and Manufacturing Forum*	PCC	Exhibit Hall E
3:30 PM	394	Division Plenary: Food, Pharmaceutical, and Bioengineering Division (Invited Talks)	PCC	N-129AB
3:30 PM	402	Biomimetic Materials II	PCC	N-121C
3:30 PM	408	Particle Technology in Product Design and Manufacturing*	PCC	W-106A
3:30 PM	410	Continuous Processing in Drug Substance and Drug Product: Integrated Processes	PCC	N-123
3:30 PM	411	Integrated Product and Process Design with Pharmaceutical Applications II	PCC	N-122C
3:30 PM	417	Infection & Prevention, Epidemiology & Treatments, Diagnostic Approaches*	PCC	N-126C
6:15 PM	424	SBE's James E. Bailey Award Lecture	PCC	North Ballroom 120D
<b>WEDNESDAY, NOVEMBER 16</b>				
8:00 AM	447	Drug Delivery Strategies for Immunomodulation	PCC	N-126A
8:00 AM	449	New tools & strategies for metabolic engineering	PCC	N-125A
8:00 AM	450	Synthetic biology of underutilized organisms with unique phenotypes	PCC	N-125B
8:00 AM	463	Plenary Session: Pharmaceutical Discovery, Development and Manufacturing Forum (Invited Talks)	PCC	N-124AB
8:00 AM	467	Next Generation Biomolecules and Bioprocesses*	PCC	N-130
8:00 AM	471	Tissue Engineering, Bioprinting, and Regenerative Medicine*	PCC	N-126C

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TIME	SESSION #	SESSION	PROPERTY	ROOM
11:15 AM	475	John M. Prausnitz AIChE Institute Lecture	PCC	North Ballroom 120D
12:30 PM	497	Drug Delivery for Applications in the Brain, Nervous System, and Musculoskeletal System	PCC	N-126A
12:30 PM	498	Engineering bacteria for novel chemistry and interactions	PCC	N-125B
12:30 PM	500	Metabolic Platform Development- Non-Conventional Species and Systems	PCC	N-125A
12:30 PM	501	Sustainable Biodegradable Polymers from Renewable & Waste Resources *	PCC	N-228A
12:30 PM	513	Advances in New Modalities: Predictive Modeling Technologies	PCC	N-123
12:30 PM	514	Panel Session: Pre-competitive Collaborations Through The Enabling Technologies Consortium (ETC)	PCC	N-124AB
12:30 PM	515	Pharma 4.0 (Advanced Controls, Process Automation, Data Analytics, etc.) in Drug Substance and Drug Product I	PCC	N-122C
12:30 PM	526	Engineering Cancer I: Mechanistic Studies*	PCC	N-126C
12:30 PM	528	Next-Gen Manufacturing in Pharma, Food, and Bioprocessing I*	PCC	N-221A
3:30 PM	553	Advances in Metabolic Engineering- Eukaryotic Organisms	PCC	N-125A
3:30 PM	555	Micro- and Nano-Scale Technologies in Life Sciences I	PCC	N-126A
3:30 PM	556	New approaches for gene and protein regulation	PCC	N-125B
3:30 PM	558	Biomaterials for Drug Delivery I: Particle Platforms	PCC	N-121B
3:30 PM	565	Advances in Drug Discovery Processes (including HTE): Advanced Technology Approaches to Maximize Public Health Impacts	PCC	N-127A
3:30 PM	566	Advances in New Modalities: Biologics and Large Molecules	PCC	N-123
3:30 PM	567	Pharma 4.0 (Advanced Controls, Process Automation, Data Analytics, etc.) in Drug Substance and Drug Product II	PCC	N-122C
3:30 PM	573	Engineering Cancer II: Therapy*	PCC	N-126C
6:15 PM	578	William R. Schowalter Lecture	PCC	North Ballroom 120D
<b>THURSDAY, NOVEMBER 11</b>				
8:00 AM	594	Advances in Metabolic Engineering- Prokaryotic Organisms	PCC	N-125A
8:00 AM	595	Micro- and Nano-Scale Technologies in Life Sciences II	PCC	N-126A
8:00 AM	596	Molecular and Cellular Sensing Technologies	PCC	N-125B
8:00 AM	597	Systems Biology for Engineering Microbes	PCC	N-126B
8:00 AM	600	Biomaterials for Drug Delivery II: Hydrogels and Macroscopic Platforms	PCC	N-122B
8:00 AM	601	Hydrogel Biomaterials I: Emerging Applications	PCC	N-121B
8:00 AM	605	Advances in New Modalities: Peptides, Nucleic acids	PCC	N-123

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TIME	SESSION #	SESSION	PROPERTY	ROOM
8:00 AM	606	Computational Solid State Pharmaceuticals I	PCC	N-122C
8:00 AM	612	Transformation from Batch to Continuous Processing in Bioseparations *	PCC	N-131B
8:00 AM	616	Engineering Cancer III: Devices for Diagnosis, Culturing, and Microenvironment Studies*	PCC	N-126C
12:30 PM	630	Cell Culture Engineering and Biopharmaceutical Manufacturing	PCC	N-125B
12:30 PM	631	Cells, Organs, and Labs on a Chip	PCC	N-126A
12:30 PM	632	General Topics in Synthetic Biology and Metabolic Engineering	PCC	N-125A
12:30 PM	633	Systems Biology for Engineering Metabolism	PCC	N-126B
12:30 PM	636	Biopolymers*	PCC	N-122B
12:30 PM	637	Hydrogel Biomaterials II: Cell Instructive Platforms	PCC	N-121B
12:30 PM	640	Advances in Drug Discovery Processes (including HTE): Protein Engineering Approaches with Target Therapeutic Applications	PCC	N-123
12:30 PM	641	Computational solid state pharmaceuticals II	PCC	N-122C
3:30 PM	663	Biobased and Bioderived Processes for Value Added Chemicals and Advanced Materials	PCC	N-125B
3:30 PM	664	Diagnostic Technologies for Clinical Applications	PCC	N-125A
3:30 PM	665	Systems Biology of Development and Cancer	PCC	N-126B
3:30 PM	668	Hydrogel Biomaterials III: Design and Characterization	PCC	N-121B
3:30 PM	672	Advancements in Particle Engineering and Material Sciences in Pharmaceutical Process Development I	PCC	N-123
3:30 PM	673	Modeling solubility, dissolution, permeability and drug delivery	PCC	N-122C
<b>FRIDAY, NOVEMBER 12</b>				
8:00 AM	688	Applied Math for Biomedical Systems*	PCC	N-126C
8:00 AM	693	Cell-free systems and DNA assembly platforms	PCC	N-125B
8:00 AM	694	Systems and Quantitative Biology: Disease Mechanisms and Therapies	PCC	N-125A
8:00 AM	700	Advancements in Particle Engineering and Material Sciences in Pharmaceutical Process Development II	PCC	N-123
8:00 AM	701	Computational approaches to DoE and better process understanding	PCC	N-122C
12:30 PM	713	Protein Assemblies and Aggregates	PCC	N-125A

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