


The 25th Northeast Asia Symposium: Synthetic Biology
2024. 09.09(Mon)-09.12(Thu)
Seoul National University HOAM Faculty House

Organized by Junho LEE(Seoul National University)
George Guo-Qiang CHEN(Tsinghua University)
Takeshi OMASA(Osaka University)


Local organizer Ji-Sook HAHN
(Seoul National University)

Supported by

 한국연구재단 National Research Foundation of Korea

 国家自然科学基金委员会 National Natural Science Foundation of China

 JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE
日本学術振興会 Japan Society for The Promotion of Science

 SCIENCE The Research Institute of Basic Sciences
Seoul National University

Sep. 10 (Tue)

Opening remarks by organizers

09:00-09:15

Junho LEE(Seoul National University)
George Guo-Qiang CHEN(Tsinghua University)
Takeshi OMASA(Osaka University)

Session 1: New tools in synthetic biology-1

Chair: Junho LEE

9:15-9:40

Peng CHEN(Peking University)

Genetically encoded bioorthogonal chemistry in living systems----- 14

9:40-10:05

Huifeng JIANG(Tianjin Institute of Industrial Biotechnology)

Enzymatic DNA synthesis -----16

10:05-10:30

Hao SONG(Tianjin University)

Engineering extracellular electron transfer pathways for bioelectricity applications
-----18

Coffee Break 10:30-10:50

Session 2: AI-based design

Chair: Donghyuk KIM

10:50-11:15

Jin-Wu NAM(Hanyang University)

AI-aided design of augmented RNA molecules -----22

11:15-11:40

Minkyung BAEK(Seoul National University)

AI-based protein structure prediction and its application to protein design ---- ---24

11:40-12:05

Hikaru NAKAZAWA(Tohoku University)

Machine learning-assisted molecular evolution for stable enzyme engineering ---26

12:05-12:30

Weidong TIAN(Fudan University)

Significant association of human-specific expanded short tandem repeats with neuronal development and disorders -----28

Lunch 12:30-14:00

Session 3: Synthetic biology in therapeutics and diagnostics-1

Chair: Takeshi OMASA

- 14:00-14:25 Hyongbum (Henry) KIM(Yonsei University)
Saturation resistance profiling of EGFR variants against tyrosine kinase inhibitors
using prime editing -----32
- 14:25-14:50 Haifeng YE(East China Normal University)
Cybergenetics for controllable living therapeutics -----34
- 14:50-15:15 Huishan LI(KAIST)
Small molecule gated T Cells for next generation of immunotherapy -----36
- 15:15-15:40 Masahiro KAWAHARA(National Institutes of Biomedical
Innovation, Health and Nutrition)
Tailoring synthetic receptors toward precision cell fate control -----38

Coffee Break 15:40-16:00

Session 4: Synthetic biology in therapeutics and diagnostics-2

Chair: Haifeng YE

- 16:00-16:25 Takeshi OMASA(Osaka University)
Chinese hamster-derived cell line – An artificial workhorse for biologics production
-----42
- 16:25-16:50 Norichika OGATA(Nihon BioData Corporation)
Cellular agents for micro environmental measurement -----44
- 16:50-17:15 Ping WEI(Shenzhen Institute of Advanced Technology)
Complex behaviors emerged from synthetic cell signaling systems -----46
- 17:15-17:40 Daehee LEE(KRIBB)
Engineered live biotherapeutics for gut inflammation-----48

Dinner 17:40-19:30

Sep. 11 (Wed)

Session 5: New tools in synthetic biology-2

Chair: Ji-Sook HAHN

9:00-9:25 SangWoo SEO(Seoul National University)
Microbial synthetic biology -----52

9:25-9:50 Xiaoxia XIA(Shanghai Jiao Tong University)
Synthetic membraneless organelles for cellular and metabolic engineering-----54

9:50-10:15 Yoshihiro TOYA(Osaka University)
Optogenetic technologies for microbial metabolic engineering -----56

Coffee Break 10:15-10:30

Session 6: Synthetic biology in metabolic engineering-1

Chair: Tomohisa HASUNUMA

10:30-10:55 George Guo-Qiang CHEN(Tsinghua University)
Next generation industry biotechnology based on synthetic biology of Halomonas
-----60

10:55-11:20 Ji-Sook HAHN(Seoul National University)
Yeast metabolic engineering for sustainable chemical production -----62

11:20-11:45 Liming LIU(Jiangnan University)
Microbial sequestration carbon dioxide to synthesis chemicals -----64

Lunch 11:45-13:30

Session 7: Synthetic biology in metabolic engineering-2

Chair: Liming LIU

13:30-13:55 Hikaru SEKI(Osaka University)
Synthetic biology for plant-based production of valuable triterpenoids -----68

13:55-14:20 Min-Kyu OH(Korea University)
Development of synthetic biology tools for heterologous production of
Streptomyces secondary metabolites -----70

14:20-14:45 Masahito ISHIKAWA(Nagahama Institute
of Bio-Science and Technology)
Strategy for genetic manipulation of the non-competent bacterium Acinetobacter
sp.Tol 5 toward synthetic biology applications-----72

Coffee Break 14:45-15:15

Session 8: Biofoundry

Chair: George Guo-Qiang CHEN

15:15-15:40 Joon Young(Leon) JUNG(CJ CheilJedang)
A next generation biotech platform for the sustainable future -----76

15:40-16:05 Donghyuk KIM(UNIST)
Computational and deep learning-based analysis components for biofoundry --78

16:05-16:30 Tomohisa HASUNUMA(Kobe University)
Data-driven synthetic biology for biomanufacturing -----80

16:30-16:55 Minoru SEKI(Chiba University)
Biomanufacturing trends, technical issues, and bioeconomy prospects -----82

Wrap-up 16:55-17:40

Dinner 18:00-20:00