

KSABC International Symposium 2024

**Nature based solution
for sustainability**

July 1 - 3, 2024
ICC JEJU, Jeju, Korea



한국응용생명화학회
Korean Society for Applied Biological Chemistry

Plenary Lectures

July 1 (Mon), Halla Hall

Chair: Sei-Ryang Oh (Korea Research Institute of Bioscience and Biotechnology)



PL-1 14:00-14:40

Empowering Bio-Digital Transformation with Synthetic Biology and Biofoundry

Seung Goo Lee

¹*Synthetic Biology and Bioengineering Research Institute, KRIBB, Daejeon 34141,*

²*Biosystems and Bioengineering Dept., UST KRIBB School, Daejeon 34113,*

³*Graduate School of Engineering Biology, KAIST, Daejeon 34141, Republic of Korea*

July 2 (Tue), Halla Hall A

Chair: Ji-Hoon Lee (Jeonbuk Nat'l University)



PL-2 11:20-12:00

Microbial Intelligence Cleaning from Methane to Polymer

Hor-Gil Hur

School of Environment and Energy Engineering, Gwangju Institute of Science and Technology, Republic of Korea

Award Lectures

July 1 (Mon), Halla Hall

Chair: Dae Young Lee (Kyungpook Nat'l University)



 **학술상** 1967년도 제정


AL-1 14:40-15:00

Journey to Promising Enzymes and their Inhibitors: from Cel to BACE1

Hoon Kim

Department of Pharmacy, Suncheon National University, Suncheon 57922, Republic of Korea



 **기초(基倉)과학상** 기초(基倉) 한태릉 전임회장의 후원으로 2010년도 제정


AL-2 15:00-15:20

Application of Next Generation Sequencing for Antibiotic Resistance Investigation

Tatsuya Unno

Department of Microbiology, Chungbuk National University, Cheongju, Chungbuk 28644, Republic of Korea



 **HAN BIO Award** 한바이오 그룹 후원으로 2022년도 제정

AL-3 15:20-15:40

Biogenic nanomaterials for eradication of environmental pollution

Myeong-Hyeon Wang

Department of Bio Health Convergence, Kangwon National University, Chuncheon, 200-701, Republic of Korea

Special Lecture

July 1 (Mon), Halla Hall

Chair: Moonsung Choi (Seoul Nat'l University of Science & Technology)



SL-1

15:50-16:50

축구 전설들의 성공 비밀과 그들의 실패 극복법

박문성

스포츠해설가

Symposia

S1 Biochemistry · Molecular Biology

July 2 (Tue), Halla Hall A

Chair: Bong-Gyu Mun (Chungbuk Nat'l University)



S1-1 13:00-13:25

Molecular mechanisms underlying our sleep cycles and sleep disorders

Choogon Lee

College of Medicine, Florida State University, 1115 West Call Street, Tallahassee, USA



S1-2 13:25-13:50

Chromatin remodeling and DNA methylation associated with plant phenotypic diversity and human disease

Seung Cho Lee

*¹HHMI/Cold Spring Harbor Laboratory, NY, USA,
²Genius Inc., Seoul, Republic of Korea (Present)*



S1-3 13:50-14:15

Mass spectrometry-based proteomics for systems biology

Min-Sik Kim

Department of New Biology, DGIST, Daegu 42988, Republic of Korea



S1-4 14:15-14:40

Two for One: Bacteriophage proteins for both biocontrol and detection of pathogens

Minsuk Kong

Department of Food Science and Biotechnology, SeoulTech, Seoul, 01811, Republic of Korea



S2

Natural Products · Bioactive Materials · Biomedical Sciences

July 2 (Tue), Halla Hall B

Chair: Jin-Soo Park (Korea Institute of Science and Technology)



S2-1 **13:00-13:20**

Evaluation of the pharmacokinetic properties in terms of protein binding assay and permeability of andrographolide molecules in synovial membrane cells model

Korbtham Sathirakul

Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok 10400, Thailand

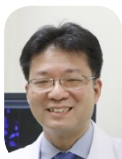


S2-2 **13:20-13:40**

A New Family of Peptide Cyclases Enabled Streamlined Chemoenzymatic Synthesis of Cyclic Peptides

Kenich Matsuda

Faculty of Pharmaceutical Sciences, Hokkaido University, Japan



S2-3 **13:40-14:00**

Zebrafish screening platform for clinical effects of natural products

Yoonsung Lees

*¹School of Medicine, Kyung Hee University, Seoul 02447, Republic of Korea,
²Clinical Research Institute, Kyung Hee University Hospital at Gangdong, Seoul 05278, Republic of Korea*



S2-4 **14:00-14:20**

BACE1 inhibitory potential of selected medicinal plants collected from high altitude of Nepal

Bishnu Prasad Pandey

*¹Department of Chemical Science and Engineering, Kathmandu University, PO Box No. 6250, Dhulikhel, Kavre, Nepal,
²Department of Pharmacy, and Research Institute of Life Pharmaceutical Sciences, Suncheon National University, Suncheon 57922, Republic of Korea*



S2-5 **14:20-14:40**

A New Strategy for Developing Functional Biomaterials Using Natural-derived Nano-like Vesicles

Young Bae Ryu

Functional Biomaterial Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Jeongseup 56212, Republic of Korea

S3

AI 기반 맞춤형식품 솔루션

July 2 (Tue), Samda Hall A

Chair: Min Young Um (Korea Food Research Institute)



S3-1 13:00-13:25

식품 커스터마이징 산업 동향 및 R&D 연구 전략

정창화

한국식품연구원 푸드디지털플랫폼기획단



S3-2 13:25-13:50

Predicting Food Nutrients and Customized Product Applications based a Machine Learning approach

Ji-Youn Hong

Department of Food and Biotechnology, Department of Food Regulatory Science, Korea University, Sejong, 30019, Republic of Korea

July 2 (Tue), Samda Hall A

Chair: 안지윤 (Korea Food Research Institute)



S3-3 13:50-14:15

개인맞춤형 건강개선, 식단관리 동향 및 접근 방안

이한석

레스토랑



S3-4 14:15-14:40

식품 연구 데이터의 디지털 전환 기술

박정민

한국식품연구원 지능화정책팀



S4

산업바이오

July 2 (Tue), Samda Hall B

Chair: Moonhyuk Kwon (Gyeongsang Nat'l University)



S4-1

13:00-13:25

Nulla Bio: Pioneering the Future of Crop Genome Editing and Plant Synthetic Biology

Jae-Yean Kim

¹Nulla Bio Inc. Jinju 52828, Republic of Korea, ²Division of Applied Life Science (BK21 Four Program), Plant Molecular Biology and Biotechnology Research Center, Gyeongsang National University, Jinju 52828, Republic of Korea



S4-2

13:25-13:50

**피부 마이크로바이옴 유래 포스트바이오틱스를 활용한 아토피성 피부염 개선 연구
허영목**

COSMAX BTI R&I Center



S4-3

13:50-14:15

Developing materials with biotechnology in the cosmetics industry

HyungWoo Jo

COSMAX BTI, R&I Center, Seongnam-si 13486, Republic of Korea



S4-4

14:15-14:40

GenoFocus: platform technology company developing enzyme and biochemical solutions

Seung Hoon Jang

R&D Center, GenoFocus Inc., 65 Techno 1-ro, Yuseung-gu, Daejeon 305-509, Republic of Korea

July 2 (Tue), Samda Hall B

Chair: Jihye Kim (Hannam University)



S4-5 14:50-15:15

Case Study: BTC Corporation's Development of Health Functional Food Ingredients

Yongduk Kim

R&D center, BTC corporation, Ansan 15588, Republic of Korea



S4-6 15:15-15:40

곤충 기반 소재 개발과 기능성 화장품 원료로의 응용

신민규

농업회사법인 푸디웍(주) 기업부설연구소



S4-7 15:40-16:05

NLRP3 억제/AhR 활성화/장내균총 개선 멀티타겟 염증성 장질환 치료제 MT102 임상 개발

김세웅

엔테라피마(주)



S4-8 16:05-16:30

바이오헬스케어의 안전성 검증과 CRO의 역할

김인섭

한남대학교 생명시스템과학과, (주)바이오피에스



S5

Environmental Sciences

July 2 (Tue), 303

Chair: Eun Hea Jho (Chonnam Nat'l University)



S5-1

13:00-13:25

Regulatory Models and Meta-models for Predicting Environmental Concentrations of Agrochemicals

Seo Jin Ki

Department of Environmental Engineering, Gyeongsang National University, Jinju 52725, Republic of Korea



S5-2

13:25-13:50

Exploring Innovative Soil Management Strategies to Address Environmental Challenges and Enhance Crop Productivity in Agricultural Ecosystems

Sang Yoon Kim

¹Department of Agricultural Chemistry & Interdisciplinary Program in IT-Bio Convergence System, Suncheon National University, Suncheon 57922, Republic of Korea, ²Department of Agricultural Life Science, Suncheon National University, Suncheon 57922, Republic of Korea



S5-3

13:50-14:15

Chemosensory adaptation upon host specialization and symbiosis

Daehan Lee

Department of Biological Sciences, Sungkyunkwan University, Republic of Korea



S5-4

14:15-14:40

Microplastic Contamination in the Agricultural Soil: Unraveling the Potential Ecological Hazards to Agroecosystems

Guanlin Li

School of Environment and Safety Engineering, Jiangsu University, Zhenjiang 212013, People's Republic of China

S6

Natural Product and Omics (KIST session)

July 2 (Tue), 301

Chair: Kwang Hyun Cha (Korea Institute of Science and Technology)



S6-1 13:00-13:25

Application of LC-MS based Metabolomics in the Study of Natural Products Research

Hee Ju Lee

Natural Product Informatics Research Center, Korea Institute of Science and Technology, Gangneung 25451, Republic of Korea



S6-2 13:25-13:50

Introduction to the application of NMR spectroscopy to the analysis of natural products with complex structures and mixed natural products

Jin Wook Cha

Natural Product Informatics Research Center, KIST Gangneung Institute, Gangneung 25451, Republic of Korea



S6-3 13:50-14:15

Host-Specific Effects of Eubacterium Species on Rg3-Mediated Osteosarcopenia Treatment in a Genetically Diverse Mouse Population

Myungsuk Kim

¹Department of Natural product Applied Science, University of Science and Technology (UST), Daejeon 34113, Republic of Korea, ²Department of Convergence Medicine, Wonju College of Medicine, Yonsei University, Wonju, Gangwon-do, Republic of Korea, ³Natural Product Research Center, Korea Institute of Science and Technology (KIST), Gangneung, Gangwon-do, Republic of Korea



S6-4 14:15-14:40

Integrative Multi-Omics Profiling Reveals Virulence Mechanisms in Pathogenic Fungi

Kyunghun Min

Department of Plant Science, Gangneung-Wonju National University, Gangneung 25457, Republic of Korea



S7

Agro-Bio Genome Editing

July 2 (Tue), Halla Hall A

Chair: Yeon Jong Koo (Chonnam Nat'l University)



S7-1

14:50-15:15

X-MAS (Cross-Mediated Allele Switching), Non-Mendelian Inheritance through CRISPR-induced HDR between F₁ Hybrid Alleles

Jae-Young Yun

School of Convergence, Seoul National University of Science and Technology, Seoul 01811, Republic of Korea



S7-2

15:15-15:40

RNA-derived genome editing in plants

Beum-Chang Kang

Department of Horticulture, Jeonbuk National University, Jeonju 54896, Republic of Korea



S7-3

15:40-16:05

Using natural variation and CRISPR to understand ripening and improve quality in tomato fruit

Je Min Lee

Department of Horticultural Science, Kyungpook National University, Daegu 41566, Republic of Korea



S7-4

16:05-16:30

CTP synthase enzyme activity regulates rice seed yield and quality

Lae-Hyeon Cho

Department of Plant Bioscience, Pusan National University, Miryang 50463, Republic of Korea

S8

Synthetic Biology

July 2 (Tue), Halla Hall B

Chair: Moonhyuk Kwon (Gyeongsang Nat'l University)



S8-1 14:50-15:15

Exploiting *Pseudomonas putida* as a Versatile Microbial Factory for Sustainable Chemical Production

Sung Kuk Lee

School of Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Republic of Korea



S8-2 15:15-15:40

Enabling New Chemistries with Ribosomes in Vitro

Joongoo Lee

Department of Chemical Engineering, POSTECH, Pohang 37673, Republic of Korea



S8-3 15:40-16:05

Synthetic Biology for *Vibrio* Microbial Platforms to Construct Efficient Biomass Refineries

Hyungyu Lim

Department of Biological Engineering, Inha University, Incheon, Republic of Korea



S8-4 16:05-16:30

Synthetic Biology Strategies for Enhanced Production of Aromatic Natural Products

Dongsoo Yang

Department of Chemical and Biological Engineering, Korea University, Seoul 02841, Republic of Korea



S9

Food Sciences

July 2 (Tue), Samda Hall A

Chair: Hae Won Jang (Sungshin Women's University)



S9-1

14:50-15:15

Allergen components to diagnose food allergy

Nobuyuki Maruyama

Laboratory of Food Quality Design and Development, Graduate School of Agriculture, Kyoto University, Kyoto, Japan



S9-2

15:15-15:40

Developments of Value Added Food Products Using Emerging Combination Technologies

Sung Hee Park

Department of Food Science and Biotechnology, Seoul National University of Science and Technology, Seoul 01811, Republic of Korea

July 2 (Tue), Samda Hall A

Chair: Hur Jinyoung (Korea Food Research Institute)



S9-3

15:40-16:05

Composition of Volatile Sulfur Compounds in Various Vegetables Consumed in Korea

Jeehye Sung

Department of Food Science and Biotechnology, Andong National University, Andong, Gyeongbuk 36729, Republic of Korea



S9-4

16:05-16:30

Flavor challenges and effective strategies in alternative foods

Min Kyung Park

Food Processing Research Group, Korea Food Research Institute, Wanju 55365, Republic of Korea

S10

Applied Microbiology

July 2 (Tue), 303

Chair: Tatsuya Unno (Chungbuk Nat'l University)



S10-1 14:50-15:15

Shewanella-supported non-external circuit Bioelectrical System for Nanoparticles Synthesis and its Potential Application on Phytopathogens Control

Cuong Tu Ho

Dept. of Environmental Treatment, Graduate University of Science and Technology, Vietnam Academy of Science and Technology, Vietnam



S10-2 15:15-15:40

Engineering and Enhancing Rhizosphere Microbiome for Sustainable Agriculture

Dongfei Han

Suzhou University of Science and Technology (USTS), Suzhou, China



S10-3 15:40-16:05

Understanding Mechanisms of Formation and Resuscitation in Persister Cells: Towards Novel Control Strategies

Sooyeon Song

Department of Animal Science, Jeonbuk National University, 567 Baekje-daero, Deokjin-gu, Jeonju-si, Jeollabuk-do 54896, Republic of Korea



S10-4 16:05-16:30

The N121T and N121S substitutions on the spike protein of SARS-CoV-2 affects to serum neutralization reactions

Hye Kwon Kim

Department of Biological Science and Biotechnology, College of Natural Science, Chungbuk National University, Cheongju 28644, Republic of Korea



S11

GreenBio Science

July 2 (Tue), 301

Chair: Kye Man Cho (Gyeongsang Nat'l University)



S11-1

14:50-15:10

Molecular Analysis and Safety Evaluation of Novel Biocontrol Agent *Metschnikowia persimmonesis* KIOM G15050 Isolated from Medicinal Plant *Diospyros kaki* Thunb.

Endang Rahmat

Biotechnology Department, Faculty of Engineering, Bina Nusantara University, Jakarta, 11480, Indonesia



S11-2

15:10-15:30

Elucidating the Intricacies of Plant-Microbe Interactions to Unlock the Symbiotic Potential of Plant Growth-Promoting Microorganisms in Diverse Horticultural Cro

Hyungmin Rho

Department of Horticulture and Landscape Architecture, National Taiwan University, Taipei, Taiwan

S12

한국생명공학연구원 천연물클러스터

July 1 (Mon), 301

Chair: 최상호 (한국생명공학연구원)



S12-1 16:50-17:00

The role of Natural Product Cluster in Korea

Sei-Ryang Oh

Natural Product Central Bank, Korea Research Institute of Bioscience and Biotechnology, Cheongju-si, Chungcheongbuk-do 28116, Republic of Korea



S11-2 17:00-17:10

A Base Bank for Korean Native Plants

Jaeyoung Kwon

KIST Gangneung Institute of Natural Products, Korea Institute of Science and Technology, Gangneung 25451, Republic of Korea



S12-3 17:10-17:20

Plant-derived natural product resource base bank

Jun Lee

Herbal Medicine Resources Research Center, Korea Institute of Oriental Medicine (KIOM), Naju 58245, Republic of Korea



S12-4 17:20-17:30

The Material Base Bank for Food Resources

Sang Yoon Choi

Korea Food Research Institute, Wanju 55365, Republic of Korea



S12-5 17:30-17:40

Development and test of Taqman probe for quantification of horseradish myrosinase gene contents in wasabi products

Hyosig Won

Institute of Natural Science, Daegu University, Gyungsan, Gyungbuk 38453, Republic of Korea



S12-6

17:40-17:50

Plant-derived functional food resource efficacy evaluation cooperation center: efficacy evaluation for activation of immune response, improving intestinal health, and improving cognitive ability

Gil-Saeng Jeong

College of Pharmacy, Chungnam National University, Daejeon 34134, Republic of Korea



S12-7

17:50-18:00

Establishment of a cooperation center for securing characteristic information of natural compounds to advance Natural Product Cluster and maximize utilization of strategic materials

Young-Won Chin

Natural Product Research Institute of Pharmaceutical Sciences, College of Pharmacy, Seoul National University, Seoul 08826, Republic of Korea



S12-8

18:00-18:10

Korea Forest Plants Essential Oil Bank

Hwan Myung Lee

Department of Biotechnology, College of Life and Health Sciences, Hoseo University, Asan 31499, Republic of Korea

Young Scientist Presentation

YS1 Biochemistry · Molecular Biology

July 2 (Tue), Halla Hall A

Chair: Tae Woo Oh (Korea Institute of Oriental Medicine)



YS1-1 10:10-10:30

Antioxidant effects of natural product in the liver through activation of the AMPK pathway that interacts with Nrf2 and YAP signalings

Su-Jin Bae

Department of Korean Medicine, Dongguk University, Gyeongju 38066, Republic of Korea



YS1-2 10:30-10:50

Inhibition of HDACs (Histone Deacetylases) Ameliorates High-Fat Diet-Induced Hypertension Through Restoration of the MsrA (Methionine Sulfoxide Reductase A)/Hydrogen Sulfide Axis

Jin Ki Jung

Senotherapy-based Metabolic Disease Control Research Center, College of Medicine, Yeungnam University, Daegu, Republic of Korea



YS1-3 10:50-11:10

Design of Metal Binding Proteins with Metal Selectivity or Enzymatic Activity

Tae Su Choi

College of Life Sciences & Biotechnology, Division of Life Sciences, Korea University, Republic of Korea



YS2

Natural Products · Bioactive Materials · Biomedical Sciences

July 2 (Tue), Halla Hall B

Chair: Seonbeom Kim (Pusan Nat'l University)



YS2-1 10:10-10:30

Unlocking silent biosynthetic gene clusters of microbes to discover novel secondary metabolites

Seungrak Lee

Department of Manufacturing Pharmacy, Pusan National University, Busan 46241, Republic of Korea



YS2-2 10:30-10:50

The Development of Next-Generation Avian Influenza COBRA Vaccines using Artificial Intelligence

Jongseo Mo

College of Pharmacy, Yeungnam University, Gyeongsan, Republic of Korea



YS2-3 10:50-11:10

Development of rapid quality evaluation technology for traditional herbal medicines

Yeongjun Ban

Herbal Medicine Resources Research Center, Korea Institute of Oriental Medicine (KIOM), 111 Geonjae-ro, Naju-si, Jeollanam-do 58245, Republic of Korea

YS3

Environmental Sciences

July 2 (Tue), Samda Hall A

Chair: Dong Yeol Lee (Gyeongnam Anti-Aging Research Institute)



YS3-1 10:10-10:30

Fate and Effects of Microplastics in the Rhizosphere

Hakwon Yoon

*Department of Biological Environment, Kangwon National University,
Chuncheon 24341, Republic of Korea*



YS3-2 10:30-10:50

Changes in Growth Characteristics and Active Compound of Wild-simulated Ginseng with Different Cultivation Environments

Yeong-Bae Yun

*Forest Medicinal Resources Research Center, National Institute of Forest
Science, Yeongju 36040, Republic of Korea*

YS4

Food Sciences

July 2 (Tue), Samda Hall B

Chair: Min Jung Kim (Korea Food Research Institute)



YS4-1

10:10-10:30

Improving stress vulnerability in aging through rosmarinic acid supplementation

Jung-Eun Lee

*Research Division of Food Functionality, Korea Food Research Institute,
Wanju 55365, Republic of Korea*



YS4-2

10:30-10:50

Norharmane extends healthspan in *Caenorhabditis elegans* and prevents muscle aging in mice via activation of SKN-1/NRF2 stress response pathway

Farida Sukma Nirmala

*Department of Food Biotechnology, Korea University of Science and Technology,
Daejeon-si, Republic of Korea*



YS4-3

10:50-11:10

Improvement in the Beef Protein Digestibility *In Vitro* by Freezing and Aging Processes for Complementary Foods

Seonmin Lee

*Division of Animal and Dairy Science, Chungnam National University, Daejeon,
Republic of Korea*

YS5

Applied Microbiology

July 2 (Tue), 303

Chair: Youri Yang (Kangwon Nat'l University)



YS5-1 10:10-10:30

Development of microbial biocontrol agent (*Lysinibacillus capsici* TT41.) for enhancement of drought stress tolerance in Kimchi Cabbage (*Brassica rapa* L. subsp. *pekinensis*) secondary metabolites by LC-MS/MS system

Tae Jin Kim

Using Technology Development Department, Bio-resources Research Division, Nakdonggang National Institute of Biological Resources, Gyeongsangbuk-do, 37242, Republic of Korea



YS5-2 10:30-10:50

Pannorin isolated from marine-derived *Penicillium* sp. SG-W3 as a selective monoamine oxidase A inhibitor

Jong Min Oh

Department of Pharmacy, and Research Institute of Life Pharmaceutical Sciences, Suncheon National University, Suncheon 57922, Republic of Korea



YS5-3 10:50-11:10

Efficient Valorization of Food Waste Oils to Renewable Biodiesel by a *Candida antarctica* Lipase B Mutant that Catalyzes the Ester Synthesis Reaction in the Presence of Water

Hyunjun Ko

¹Synthetic Biology and Bioengineering Research Center; Korea Research Institute of Bioscience and Biotechnology (KRIBB), 125 Gwahak-ro, Yuseong-gu, Daejeon, 34141, Republic of Korea, ²Department of Forest Biomaterials Engineering, College of Forest and Environmental Sciences, Kangwon National University, Chuncheon 24341, Republic of Korea