

단백질/효소공학 (Protein and Enzyme Engineering)

- P0001** Synergistic Multi Enzyme Platform for Isopropanol Detection Using Electrochemical Biosensing Assay
Nisha BHARDWAJ, Myeong-Eun LEE, Young Jin KO, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0002** Enhanced Biodegradation of Waste Poly (Ethylene Terephthalate) Exploiting Carboxylesterases Complex
Dong-Hyeok HWANG, Myeong-Eun LEE, Byeong-Hyeon CHO, Jun Won OH, Seung Kyou YOU, Young Jin KO, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0003** Electroenzymatic CO₂ Reduction and Formate Oxidation by Synthetic NADH-free Formate Dehydrogenase (FDH)
Min Ji KIM, Stacy Simai REGINALD, Hyeryeong LEE, Serah CHOI, Basit SHARIF, In Seop CHANG
 School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, Korea
- P0004** L-Dopa Induces Thermogenesis in White Adipocytes via Activation of Dopaminergic and Adrenergic Receptors
Kiros HADDISH, Sulagna MUKHERJEE, MinJi CHOI, Jong Won YUN
 Department of Biotechnology, Daegu University, Gyeongsan, Korea
- P0005** Loss of Lymphocyte Cytosolic Protein 1 (LCP1) Induces Browning in 3T3-L1 Adipocytes via β 3-AR and the ERK-Independent Signaling Pathway
Manigandan SUBRAMANI, Jong Won YUN
 Department of Biotechnology, Daegu University, Gyeongsan, Korea
- P0006** Genetically Encoded Biosensors for the GR-effector Screening
Chungwon KANG, Youngeun KWON
 Department of Biomedical Engineering, Dongguk University, Seoul, Korea
- P0007** Kit and Method for Screening of Antibody Using GPCR-embedded Nanodiscs
Soo KIM¹, Hwi Jin KO^{2,3}, Tae Shin PARK³, Tai Hyun PARK^{1,2}
¹Interdisciplinary Program for Bioengineering, Seoul National University, Seoul, Korea, ²The School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, Korea, ³Receptech Inc., Seoul, Korea
- P0008** Production of CXCR2 in *E. coli* and Reconstitution of Its Molecular Structure Using a Nanodisc
Hyun Young PARK¹, Soo KIM², Hwi Jin KO³, Tae Shin PARK³, Tai Hyun PARK^{1,2,3}
¹School of Chemical and Biological Engineering, Seoul National University, Seoul, Korea, ²Interdisciplinary Program in Bioengineering, Seoul National University, Seoul, Korea, ³Receptech Inc, Seoul, Korea

- P0009** Producing Full-length Botulinum Neurotoxin (BoNT) Using Protein Conjugation
Minju KIM, Jihwan CHUN, Wonbeom PARK, SeungJoo KIM, Yong Hwan LEE, Nayoon CHOI, Dae-Hyuk KWEON
Department of Biotechnology and Bioengineering, Sungkyunkwan University, Suwon, Korea
- P0010** Production of Ulvan Lyase Enzyme Complex for Enzymatic Depolymerization of Ulvan into Effective Low-molecular-weight Ulvan
Ye Won JO, Jeong Eun HYEON
Department of Food Science and Biotechnology, College of Knowledge-Based Services Engineering, Sungshin Women's University, Seoul, Korea
- P0011** Increased Efficiency of Biomass Oligosaccharide Production from Porphyrin by Constructing Artificial Complex Enzyme through Bioengineering Technology
Joo Hee HAN, Jeong Eun HYEON
Department of Food Science and Biotechnology, College of Knowledge - Based Services Engineering, Sungshin Women's University, Seoul, Korea
- P0012** Structural and Functional Investigation of the Domain Fusion in Glycerol Dehydratase that Elevate Its Enzymatic Activity
Abdul NASIR, Chaeyeong NA, Tae Hyeon YOO
Department of Molecular Science and Technology, Ajou University, Suwon, Korea
- P0013** Proximity Proteolysis Reaction as a Universal Platform of Molecular Sensing Methods
Minji GWON¹, Hyeon Ji PARK¹, Yuseon KIM¹, Heeju JANG¹, Tae Hyeon YOO^{1,2}
¹Department of Molecular Science and Technology, Ajou University, Suwon, Korea, ²Department of Applied Chemistry and Biological Engineering, Ajou University, Suwon, Korea
- P0014** Self-assemble Behavior of Elastin-like Polypeptides (ELPs) Composed of VPGKG and VPGVG Blocks with Different Block Ratios
Jeong-Wan CHOI, Gyu-Jin JEONG, Min-Woo HWANG, Jisoo LEE, Jong-In WON
Department of Chemical Engineering, Hongik University, Seoul, Korea
- P0015** The N-terminal Unnatural Amino Acid Incorporation with Orthogonal Translation System Engineering
Sangwoo LEE¹, Byeong Sung LEE¹, Woon Jong CHOI¹, Tae Hyeon YOO^{1,2}
¹Department of Molecular Science and Technology, Ajou University, Suwon, Korea, ²Department of Applied Chemistry and Biological Engineering, Ajou University, Suwon, Korea
- P0016** Engineering of Alpha-ketoglutaric Semialdehyde Dehydrogenase for Improving the Catalytic Activity Toward 3-HPA via 3-HP Selection Device and 96-well Microplate-based Screening
Ye Seop PARK¹, Sunjoon CHOI¹, Abdul NASIR¹, Joo Yeon SEOK², Gyoo yeol JUNG², Sunghoon PARK³, Tae Hyeon YOO¹
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- P0017** Enhancing the Sensitivity of Lateral Flow Immunoassay by Engineered Cellulose-binding Protein Linker Fused with Antibody-binding Domains
Su min KIM¹, Chang sup KIM^{1,2}
¹Graduate School of Biochemistry, Yeungnam University, Gyeongsan, Korea, ²School of Chemistry and Biochemistry, Yeungnam University, Gyeongsan, Korea
- P0018** Developing Efficient Protein Expression System to Produce Dengue Viral Non-structural Protein 1
Eunjeong KIM, Sooim SHIN
 Department of Biotechnology and Bioengineering, College of Engineering, Chonnam National University, Gwangju, Korea
- P0019** Production of Human Metabolites of Phloretin by Bacterial CYP102A1 Peroxygenase
Jang HAN SOL, Mok JIAE, Kim JEONG-HOON, Nguyen NGOC ANH, Yun CHUL-HO
 School of Biological Sciences and Biotechnology, Graduate School, Chonnam National University, Gwangju, Korea
- P0020** Expression of an M Cell-specific Ligand-fused FMDV Epitope Using *Saccharomyces cerevisiae*
Ngoc LE MY TIEU¹, Hee-Won SEO¹, Kum-Kang SO², Jeesun CHUN², Dae-Hyuk KIM^{1,2,3}
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- P0021** Immobilization of Urease onto Cobalt-nitrogen-carbon Catalytic Membrane for Stabilization and Recycling
Otgontuya ERDENEDALAI, JungHeon LEE
 Department of Chemical Engineering, Chosun University, Gwangju, Korea
- P0022** Development of Enhanced Protease Production Strain from *Bacillus teguilensis* Mutant
Undrakh KHURELOCHIR, Jungheon LEE
 Department of Chemical Engineering, Chosun University, Gwangju, Korea
- P0023** Screening of Bst Polymerase Specific Aptamers for Enhancing the Reverse Transcriptional Activity
Do-Young KIM, Woo-Ri SHIN, Simranjeet Singh SEKHON, Ji-Young AHN, Yang-Hoon KIM
 Major in Microbiology School of Biological Sciences College of Natural Sciences, Chungbuk National University, Cheongju, Korea
- P0024** Heterologous Production of 3-hydroxy-4-methyl Anthranilic Acid, an Intermediate for the Biosynthesis of Antitumor Pyrrolobenzodiazepines
Komal SHARMA, Hyun Uk KIM
 Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

- P0025** Affinity Peptide Directed Site-specific Conjugation of IgG via a Facile Photocrosslinking
Jisoo PARK¹, Yeaji LEE¹, Tae Hyeon YOO^{1,2}
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- P0026** Substrate Specificity Analysis of Reductases for Hydroxy Acid Biosynthesis
Jisu PARK^{1,2}, Hoe-Suk LEE², Hae Ji JEON², Han Sol KIM², Taejung KIM¹, Jungyeob HAM¹, Young Joo YEON², Young-Tae PARK¹
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- P0027** Development of Inkless Visual Volumetric Chip for Point-of-care Testing
Hyogu HAN^{1,2}, Jun Ki AHN¹, Suk-Jung CHOI²
¹Material & Component Convergence R&D Department, Korea Institute of Industrial Technology (KITECH), Ansan, Korea, ²Department of Chemistry, Gangneung-Wonju National University, Gangneung, Korea
- P0028** Thermostable and Long-circulating Albumin-conjugated Urate Oxidase for Gout Treatment
Na Hyun KWON, Byungseop YANG, Inchan KWON
School of Material Science and Engineering, Gwangju Institute of Science and Technology, Gwangju, Korea
- P0029** Manipulation of Artificial Chromosome Containing Desired Gene Cluster and Mitotic Stability Analysis in Yeast
Da-In KANG, Yeon-Hee KIM
Biomedical Engineering and Biotechnology Major, Division of Applied Bioengineering, Dong-Eui University, Busan, Korea
- P0030** Physiological Analysis and Construction of Mini- yeast Artificial Chromosome Harboring Agar Degradation Genes
Min-Jun SEONG, Yeon-Hee KIM
Biomedical Engineering and Biotechnology Major, Division of Applied Bioengineering, Dong-Eui University, Busan, Korea
- P0031** Site-specific Methylation of Epigallocatechin Gallate (EGCG) by Bacterial O-methyltransferas
Gyeong-Guk PARK¹, Heewon NHO², Uk-Jae LEE², Joo-Hyun SEO³, Byung-Gee KIM^{1,2,4,5,6}
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P0032 Fast and Exact Protein Characterization Method Using Trap Column in Nano LC System: Intact Mass Analysis Result Compare with Other Sample Preparation Method

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P0033 Auxiliary Role of Oct-1 for the Soluble Expression of Recombinant Protein in *Escherichia coli*

SeungJoo KIM, Jihwan CHUN, Wonbeom PARK, NaYeon KIM, MinJu KIM, Yong Hwan LEE, Dae-Hyuk KWEON

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P0034 Inhibition of Antidepressant Ergot Alkaloid on KCNQ Channel

Shinhui LEE, Junho LEE

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P0035 The Regulation of Triterpenoids on Human Nicotinic Acetylcholine Receptor

Junho LEE

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P0036 Optimization of Culture Condition for Amylase Production by Response Surface Methodology

Jong-il CHOI¹, Jeong-Haeng CHO²

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식품생물공학 (Food Biotechnology)

- P0101** Characterization of *Bacillus velezensis* Strain Isolated from Doenjang and Its Antifungal Activity against *Fusarium* Species
Geun-Hyung KIM, Min-Gyu YANG, Kwang-Rim BAEK, Seung-Oh SEO
Department of Food Science and Nutrition, The Catholic University of Korea, Bucheon, Korea
- P0102** Isolation of *Lactiplantibacillus plantarum* from Kimchi for Development of Korean Sourdough Starter Culture
Min-Ji KANG, Jin-Young JUNG, Ye-Rim LEE, Seung-Oh SEO
Department of Food Science and Nutrition, The Catholic University of Korea, Bucheon, Korea
- P0103** Comparison of Immunomodulatory Effects of the Cell Extracts from Two Different Variants of *Saccharomyces cerevisiae*
Kwang-Rim BAEK, Min-Ji KANG, Ye-Rim LEE, Seung-Oh SEO
Department of food science and nutrition, The Catholic University of Korea, Bucheon, Korea
- P0104** Improved Production of Heme Porphyrins in *Bacillus megaterium* by a Cumate-inducible Promoter
Kwang-Rim BAEK, Geun-Hyung KIM, Min-Gyu YANG, Seung-Oh SEO
Department of food science and nutrition, The Catholic University of Korea, Bucheon, Korea
- P0105** Evolutionary Engineering of Beneficial Gut Microorganisms for Industrial-scale Production of Cell Mass
Min-Gyu YANG, Jin-Young JUNG, Seung-Oh SEO
Department of Food Science and Nutrition, The Catholic University of Korea, Bucheon, Korea
- P0106** Development of Therapeutic Probiotics for Oral Treatment of Hyperuricemia
Ye-Rim LEE, Jin-Young JUNG, Seung-Oh SEO
Department of Food Science and Nutrition, The Catholic University of Korea, Bucheon, Korea
- P0107** Expression of Heterologous Bacterial CO₂-fixation Pathway in Yeast
Sujeong PARK, Deokyeol JEONG, Suhyeung KIM, Bonbin GU, Soo Rin KIM
School of Food Science and Biotechnology, Kyungpook National University, Daegu, Korea
- P0108** Development of Clarification Methods for Apple Cider Production from Fresh Apples
Jamin SHIN, Jueun JANG, Soo Rin KIM
School of Food Science and Biotechnology, Kyungpook National University, Daegu, Korea
- P0109** Bioconversion of Marin Wastes into Bioplastic Monomers
Jamin SHIN, Jueun JANG, Yebin JU, You-Kyung LEE, Jeongman SEOL, Soo Rin KIM
School of Food Science and Biotechnology, Kyungpook National University, Daegu, Korea
- P0110** L-lactic Acid Production Using Adaptively Evolved *Saccharomyces cerevisiae*
Byeong-Kwan JANG, Deokyeol JEONG, YeBin JU, Soo Rin KIM
School of Food Science and Biotechnology, Kyungpook National University, Daegu, Korea

- P0111** Alkaline Deacetylation for Cellulosic Ethanol Production Using Potential Energy Crops
Yebin JU, Soo Rin KIM
 School of Food Science and Biotechnology, Kyungpook National University, Daegu, Korea
- P0112** Regulation of Beige Adipogenesis and Thermogenesis by Fatty Acid-derived Natural Substance
Suyeon YUN, In Soo PYO, Mi-Young JEONG, Moonki CHAE, Sung-Joon LEE
 Department of Biotechnology, Graduate school of Life Science and Biotechnology, College of Life Sciences & Biotechnology, BK21-PLUS, Korea University, Seoul, Korea
- P0113** Relationships Between Single Nucleotide Polymorphism in IGF-1 Gene and Bodyweight of Rainbow Trout (*Oncorhynchus mykiss*)
Hanchen ZHANG¹, Namrata JAWANJAL¹, ByungHwa YOO², Hyung Ho LEE¹
¹Department of Biotechnology, Pukyong National University, Busan, Korea, ²JangHang fish farm, Seocheon, Korea
- P0114** Ameliorative Effects of Hydrolysate Extracted from Abalone Intestine on *Dermatophagoides farinae*-induced Atopic Dermatitis-like Skin Lesions in Mice Model
Tae-Hee KIM^{1,2}, Seong-Yeong HEO^{2,3}, Gun-Woo OH^{2,3}, Won Sun PARK⁴, Il-Whan CHOI⁵, Zhong-Ji QIAN⁶, Won-Kyo JUNG^{1,2,3}
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- P0115** Single Nucleotide Polymorphisms Study of Rainbow Trout (*Oncorhynchus mykiss*) in Skeletal Muscles Gene Like Myostatin
Namrata JAWANJAL¹, Hanchen ZHANG¹, ByungHwa YOO², Hyung Ho LEE¹
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- P0116** Characterization of the *Lactiplantibacillus* as Potential Probiotics for Alleviating Metabolic Syndrome
So Young PARK, Eun Ji LEE, Nan Kyung KIM, So-Jeong KIM, Sun Jay YOON, Dong Nyoung OH, Sung Jin JEONG, Na Yeong BEEN, Ji Hyeon KIM, Da Yeong KIM, Jin Won CHOI, Won Je JANG, Jong Min LEE
 Department of Biotechnology, Pukyong National University, Busan, Korea
- P0117** Weight Difference by SNPs Discovered in GHR1 of Nile Tilapia (*Oreochromis niloticus*)
Min sik JANG¹, Jun Young CHAE¹, Byung Hwa YOO², Hyung Ho LEE¹
¹Department of Biotechnology, Pukyong National University, Busan, Korea, ²JangHang fish farm, Seocheon, Korea

- P0118** Functional Expression and Extracellular Production of a Truncational Mutant of CelA in *Escherichia coli* via the Signal Recognition Particle-dependent Pathway
Hyun-Jae LEE, Tae-Gu KANG, Seok-Hyun HONG, Sun-Ki KIM
Department of Food Science and Technology, Chung-Ang University, Anseong, Korea
- P0119** Screening and Characterization of Affinity Peptides for Detection of Okadaic Acid, Known Marine Toxin
Chae Hwan CHO¹, Hyo Jeong YANG¹, Min Woo KIM², Tae Jung PARK², Jong Pil PARK¹
¹Department of Food Science and Technology, Chung-Ang University, Anseong, Korea, ²Department of Chemistry, Chung-Ang University, Seoul, Korea
- P0120** Genotyping for Detecting SNPs in Growth Hormone from Nile Tilapia (*Oreochromis niloticus*)
Jun Young CHAE¹, Min Sik JANG¹, Byung Hwa YOO², Min Sun KWON³, Hyung Ho LEE¹
¹Department of Biotechnology, Pukyong National University, Busan, Korea, ²JangHang fish farm, Seocheon, Korea, ³Land Ocean Environment Co., Ltd., Suwon, Korea
- P0121** Development of Portable Real-time Fluorescence Monitoring Instrument for Multiplex Detection of Food Poisoning Bacteria
Junghun PARK
Advanced Mechatronics R&D Group, Korea Institute of Industrial Technology (KITECH), Yeongcheon, Korea
- P0122** Development of Highly Informative Single Nucleotide Polymorphism (SNP) Assay for Genotyping in Hexaploid Wheat (*Triticum aestivum* L.)
Min-Young KANG, Jee-Soo PARK, JongHee OH, Jin-Kee JUNG
Seed Testing & Research Center, Korea Seed & Variety Service, Gimcheon, Korea
- P0123** Bioconversion of Inositol Isomers by Enzymes and Microbial Fermentation
Hyelyeon HWANG¹, Eunju KIM², Ho Jae LEE¹, Chang Hee JEONG¹, Tae Woon KIM¹, Sung Wook HONG¹
¹World Institute of Kimchi, Gwangju, Korea, ²Chungbuk Technopark Bio Center, Cheongju, Korea
- P0124** Isolation of Gluten-degrading Lactic Acid Bacteria from Fermented Foods
Do-Hoon YOO¹, Soo-Hwan YEO², Myoung-Dong KIM^{1,3}
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- P0125** The Electronic Nose Reveals Starters Influence the Flavor Characteristics of Makgeolli
Jeong-Ah YOON¹, Seong-Wook CHO¹, Soo-Hwan YEO², Myoung-Dong KIM^{3,4}
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- P0126** Evaluation of Beer Fermentation with Yeasts Isolated from Korean Traditional Food
Yu-Jeong LEE¹, Bong-Hwan CHUNG², Myoung-Dong KIM³
¹Department of Food Biotechnology and Environmental Science, Kangwon National University, Chuncheon, Korea, ²Hongcheon Institute of Medicinal Herb, Hongcheon, Korea, ³Institute of Fermentation and Brewing, Kangwon National University, Chuncheon, Korea
- P0127** Microbial Production of (–)- α -bisabolol in Metabolically-engineered *Saccharomyces cerevisiae*
Yong Ha SEO¹, Na Young LIM¹, Yong Cheol PARK¹, Do hyong KIM²
¹Department of Bio and Fermentation Convergence Technology, Kookmin University, Seoul, Korea, ²Biocraft Co., Seoul, Korea
- P0128** Multiomic Characterization of Evolved *Saccharomyces cerevisiae* HJ7-14 with High Ethanol Productivity from Algal Galactose
Min Geun SHIN¹, Su Young LIM¹, Kyoung Heon KIM², Yong Cheol PARK¹
¹Department of Bio and Fermentation Convergence Technology, Kookmin University, Seoul, Korea, ²Department of Biotechnology, Graduate School, Korea University, Seoul, Korea
- P0129** Biological Production of Azelaic Acid from Nonanoic Acid and Its Esters by Biotransformation of *Candida tropicalis*
Ho-Sun YOO, Min-Ji BU, Min-Woo JUN, Ji-Young KIM, Yong-Cheol PARK
 Department of Bio and Fermentation Convergence Technology, Kookmin University, Seoul, Korea
- P0130** Screening of High-producing Strains of D-ribose Using FLIP_{Rbs}-F16A Biosensor
SeungJoo KIM¹, Jihwan CHUN¹, Kyeong-Won KIM¹, Wonbeom PARK¹, Jeong-Hyeon YOON¹, Yong-Cheol PARK², Dae-Hyuk KWEON¹
¹Department of Biotechnology and Bioengineering, Sungkyunkwan University, Suwon, Korea, ²Department of Advanced Fermentation Fusion Science and Technology, Kookmin University, Seoul, Korea
- P0131** Measuring Total Free Amino Acid Contents Using Carbon Paper Electrode Modified with L-amino Acid Oxidase
Namhyeok CHOI, Bumjun PARK, Yun Suk HUH
 NanoBio High-Tech Materials Research Center, Department of Biological Engineering, Inha University, Incheon, Korea
- P0132** Gold Nanoparticle Based Lateral Flow Immunoassay for the Rapid and Sensitive Detection of Ractopamine in Pork
Min Ji LEE¹, Bumjun PARK¹, Eun-Seon LEE², Mi-Wha OH², Yun Suk HUH¹
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- P0133** Inhibitory Action of TRPV1 by Dibenzocyclooctadiene Lignan
Sanung EOM, Junho LEE
 Department of Biotechnology, Chonnam National University, Gwangju, Korea

- P0134** Molecular Study of Acetylcholine Receptors Inhibition by Triterpenes
Junho LEE
Department of Biotechnology, Chonnam National University, Gwangju, Korea
- P0135** Comparison of Polyphenol Content and Antioxidant Properties of Acer Pseudoplatanus Leaves of Different Colors
Ming ZHANG¹, Ting BU^{1,2}, Soah KIM¹
¹Department of Environment Science and Biotechnology, Jeonju University, Jeonju, Korea, ²University Provincial Key Laboratory for Protection and Utilization of Longdong Bio-resources in Gansu Province, College of Life Sciences and Technology, Longdong University, Qingyang, China
- P0136** Eco-friendly Process for Production of Xylooligosaccharides from Empty Fruit Bunch and Enzyme-mediated Polymerization for Purification
Dahee KIM^{1,2}, Ju-Hyun YU¹, Kyung-Sik HONG¹, Chan-Duck JUNG¹, Hoyong KIM¹, Jungbae KIM², Suwan MYUNG¹
¹Research Center for Bio-based Chemistry, Korea Research Institute of Chemical Technology (KRICT), Ulsan, Korea, ²Department of Chemical and Biological Engineering, Korea University, Seoul, Korea
- P0137** Development of Handmade Beer Using Peaches Specialized in Sejong
Soohyun JEON¹, Dai-seok YANG², Yoen-il RYU², Seon-yeong YANG², Buongson YI¹, Chan-sik KIM², Jae-ik CHOI², Sang-Kyu JUNG¹
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에너지 및 환경생물공학 (Energy and Environmental Biotechnology)

- P0201** Preparation and Adsorption Properties of Re-swellaible Alginate/Carboxymethyl Cellulose/Biochar Hydrogel Beads
Hye Jin DO, Jeong Woo LEE, Saerom PARK, Sang Hyun LEE
 Department of Biological Engineering, Konkuk University, Seoul, Korea
- P0202** Modified Biochar-based Flexible All-solid-state Microsupercapacitor Fabricated by Ink-jet Method
Hyeong Ryeol KIM¹, Eun Jeong KIM¹, Kyung Rae KIM¹, Ja Hyun LEE², Hah Young YOO³, Chulhwan PARK⁴, Seung Wook KIM¹
¹Department of Chemical and Biological Engineering, Korea University, Seoul, Korea, ²Department of Food Science and Engineering, Dongyang Mirae University, Seoul, Korea, ³Department of Biotechnology, Sangmyung University, Seoul, Korea, ⁴Department of Chemical Engineering, Kwangwoon University, Seoul, Korea
- P0203** Production of Biodiesel in *Yarrowia lipolytica* by Truncation of Wax Ester Synthase
Hyeon-Min PARK, Xiaoyu SHI, Myeong-Eun LEE, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0204** Enhancement of Enzyme Stability by Encapsulation of Lipase-copper-phosphate and Application to Biodiesel Conversion Process
Yongsang CHUN¹, Hyeong Ryeol KIM², Kyung Rae KIM², Eun Jeong KIM², Hah Young YOO³, Ja Hyun LEE⁴, Chulhwan PARK⁵, Seung Wook KIM^{1,2}
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- P0205** Amplification of PS Microplastic Detection through Plasma Effect of AuNRs Microneedle by ETPTA Micropatterning
Cholong KIM, Hyeeyeon HUR, Seungju OH, Jongmin YANG, Seongchul SHIN, Gillhwan KIM, Dhanashri DESAI, Hyunho LEE
 Department of Chemical Engineering, Myongji University, Yongin, Korea
- P0206** Influence of Small Peptides and Plant-growth-promoting Bacteria on the Quality of Biofertilizer
Su Hyeon PARK, Nan Young KIM, Se Young JUNG, Joong Kyun KIM
 Department of Biotechnology, Pukyong National University, Busan, Korea
- P0207** Antioxidant Activities of Tuna Hydrolysates Obtained from Microbial and Acid-thermal Hydrolysis
Se Young JUNG, Joong Kyun KIM
 Department of Biotechnology, Pukyong National University, Busan, Korea

- P0208** Direct and Indirect Electron Uptake Drives Different Metabolite Productions from CO₂ Electrosynthesis in *Rhodobacter sphaeroides*
Shuwei LI, Jung Rae KIM
Pusan National University, Busan, Korea
- P0209** Enhancement of Lipid and Astaxanthin Production by *Haematococcus pluvialis* Using Strigolactone
Rendi MAHADI¹, Sangui KIM¹, Laxmi Priya Sathiya VAHISAN¹, Bolam KIM¹, Nakyong LEE^{1,2}, You-Kwan OH¹
¹School of Chemical Engineering, Pusan National University, Busan, Korea, ²Institute for Environment & Energy, Pusan National University, Busan, Korea
- P0210** A Study on the Bioplastic Material through the Biomimic Simulation of Malaria Parasite
Un Jung CHAE, Eun Seo LEE, Jeong Eun HYEON
Department of Food Science and Biotechnology, College of Knowledge-Based Services Engineering, Sungshin Women's University, Seoul, Korea
- P0211** Performance and Bacterial Communities of Successive Alkalinity-producing Systems (SAPs) in Passive Treatment Processes Treating Mine Drainages Differing in Acidity and Metal Levels
Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0212** Evaluation of Microbial Fuel Cell Performance and Electrochemical Characteristics with Different Brush-anode Configurations
Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0213** Effect of Different Non-platinum Catalysts and Binders on the Performance and Electrochemical Characteristics of Microbial Electrolysis
Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0214** Effect of Different Anode Structures and Materials on the Performance and Electrochemical Characteristics of Microbial Fuel Cell
Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0215** Evaluation of the Reproducibility of Linear Sweep Voltammetry Tests in Microbial Electrolysis Cells
Bonyoung KOO, Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0216** Ultrasonication and Solution Precipitation as Novel Methods to Improve Cathode Performance of Microbial Fuel Cell
Bonyoung KOO, Sunghoon SON, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea

- P0217** Evaluation of the Electrochemical Characteristic of Microbial Fuel Cells Including Carbon-felt Bioanodes and Activated-carbon Cathodes
 Bonyoung KOO, Sunghoon SON, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0218** Reduced Graphene Oxide as Blending Material in Traditional Activated Carbon Air Cathode to Improve Performance of Microbial Fuel Cell
 Bonyoung KOO, Sunghoon SON, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0219** The Effect of Persistent Organic Pollutants from Decomposed Fat on Mitochondria in Zebrafish Organs
DongShin YANG, Hwayeon LIM, Sooim SHIN
 Department of Biotechnology and Bioengineering, College of Engineering, Chonnam National University, Gwangju, Korea
- P0220** Toxicological Effects of Polyvinyl Chloride and Low Density Polyethylene Microplastics on Territorial Organism
Songhee LEE¹, Eun Hea JHO², Sooim SHIN¹
¹Interdisciplinary Program of Bioenergy and Biomaterials Graduate School, Chonnam National University, Gwangju, Korea, ²Department of Agricultural and Biological Chemistry, Chonnam National University, Gwangju, Korea
- P0221** The Changes of Nitrate/Nitrite Concentrations and Nitrate/Nitrite Reductase Activity Changes in Soil for the Development a HONO(nitrous acid) Model
Jeongsu KIM, Jungheon LEE
 Department of Chemical Engineering, Chosun University, Gwangju, Korea
- P0222** Electro-fermentative Metabolic Shift of *Clostridium aurantobutyricum* on Potentiostatic Glucose Fermentation
Hwisco JEON, Enkhjargal GANBAATA, Taeyounn KIM
 Department of Environmental Engineering, Chosun University, Gwangju, Korea
- P0223** Identifying Mechanically Triggered Settling Mechanism of *Pyropia yezoensis* Carpospore
Sinyang KIM¹, Ji Woong LEE², Gwang Hoon KIM², Dong Soo HWANG¹
¹Division of the Environmental Science and Engineering, POSTECH, Pohang, Korea, ²Department of Biological Sciences, Kongju National University, Kongju, Korea
- P0224** Caproate Production Enhanced by *Caproiciproducens galactitolivorans* through the Pathway Shift Using Hydrogen as an Electron Donor
Pranav SASIDHARAN, Hyunjin KIM, Okkyoung CHOI, Byoung-In SANG
 Department of Chemical Engineering, Hanyang University, Seoul, Korea

P0225 Valorization of Bacterial Cellulose Produced from Crude Glycerol by Application of Energy Storage Materials

Saehee LEE, Amith ABRAHAM, Alan CHRISTIAN S. LIM, Okkyoung CHOI, Jeong Gil SEO, Byoung-In SANG

Department of Chemical Engineering, Hanyang University, Seoul, Korea

P0226 Biomethane Production from Cigarette Butts by Thermophilic Anaerobic Fermentation

Darsha PRABHAHARAN, Hyjoung PARK, Okkyoung CHOI, Byoung-In SANG

Department of Chemical Engineering, Hanyang University, Seoul, Korea

P0227 Growth Optimization of *Bacillus velezensis* RS15-1 Isolated from Soil for Control of Food Crop Disease

Ho-Dong LIM, Jun-Kyung PARK, Kong-Min KIM, Jung-Hwan JI, So-Jung RHYU, Gui Hwan HAN

Center for Industrialization of Agricultural and Livestock Microorganisms (CIALM), Jeongeup, Korea

P0228 Method of Control Bacterial Spot Disease on Pepper with a Small Amount of Antibiotics and Microorganisms

Min-Kyoung SEO, Hyun-Joo YANG, Jong-Kook JUNG, Je Yeon CHOI

Research Center for Environmentally Friendly Agricultural Life Sciences, Jeonnam Bioindustry Foundation, Gokseong, Korea

P0229 Isolation of Cellulolytic Bacteria from Swine Manure Compost

Jung Kon KIM, Dong-Jun LEE, Kwang-Hwa JEONG, Heo-Man PARK

Animal Environment Division, National Institute of Animal Science, Rural Development Administration, Wanju, Korea

P0230 Optimization of Alkali Pretreatment Conditions to Improve Enzymatic Digestibility of Chestnut Shell

Soo Kweon LEE¹, Kang Hyun LEE², Hyeong Ryeol KIM¹, Kyung Rae KIM¹, Eun Jeong KIM¹, Chulhwan PARK³, Hah Young YOO², Ja Hyun LEE⁴, Seung Wook KIM¹

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P0231 Electroactive Biofilm Formation of *Shewanella oneidensis* MR-1 in Microbial Electrochemical System

Serah CHOI, In Seop CHANG

School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, Korea

P0232 Lactic Acid Production by *Lactobacillus parabuchneri* Using Hydrolysates from Spent Coffee Grounds

Kang Hyun LEE¹, Seunghee KIM¹, Jeongho LEE¹, Chulhwan PARK², Hah Young YOO¹

¹Department of Biotechnology, Sangmyung University, Seoul, Korea, ²Department of Chemical Engineering, Kwangwoon University, Seoul, Korea

- P0233** *Methylocystis prodigia* JR2 nov., a Novel Methanotrophic Bacterium from Paddy Field Soil
Jaewon RYU¹, Sanghwa PARK², Si Wouk KIM³
¹Department of Environment Bio Research, Eco P&G co. Suwon University, Hwasong, Korea, ²Bacteria Research Team. Freshwater Bacteria Research Department, Nakdonggang National Institute of Biological Resources (NNIBR), Sangju, Korea, ³Department of Environmental Engineering, Chosun University, Gwangju, Korea
- P0234** Aquaporin Based Biomimetic Membrane for Water Desalination
Ahmed FUWAD¹, Hyunil RYU², Sun Min KIM¹, Tae-Joon JEON²
¹Department of Mechanical Engineering, Inha University, Incheon, Korea, ²Department of Biological Engineering, Inha University, Incheon, Korea
- P0235** Acute Toxicity Assessment of Neem Extract Biological Pesticides Using Daphnia
Ki-Joong KIM¹, Hyun YANG¹, Ah-Hae JO², Bum-Woo LEE¹, Seong-Jun KIM¹
¹Department of Environmental Energy Engineering, College of Engineering, Chonnam National University, Gwangju, Korea, ²Green Institute of Technology, Co. Ltd, Gwangju, Korea
- P0236** Evaluation of Acute Toxicity of Daphnia of Natural Pesticides Based on Derris Extract
Hyeon YANG^{1,2}, Ah-Hae JO², Seong-Jun KIM¹
¹Department of Environmental Energy Engineering, College of Engineering, Chonnam National University, Gwangju, Korea, ²Green Institute of Technology, Co. Ltd, Gwangju, Korea
- P0237** Inhibitory Effects of Ergoline Alkaloid on Neuronal Sodium Channel
Junho LEE
 Department of Biotechnology, Chonnam National University, Gwangju, Korea
- P0238** Power Generation and Anode Bacterial Community Compositions of Sediment Fuel Cells Differing in Anode Materials and Carbon Sources
Huong TRAN, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0239** Physicochemically Treated Activated Carbon as Material in Air Cathode to Improve Performance of Microbial Fuel Cell
Huong TRAN, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0240** Determination Stable Cell Performance Time and Anode Maturation Time of a Single Chamber Microbial Fuel Cell with a Brush Anode
Huong TRAN, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0241** Performance and Electrochemical Characteristic of Microbial Fuel Cells with Different Anode Current Collectors
Huong TRAN, Sokhee JUNG
 Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea

- P0242** Performance and Electrochemical Characteristic of a Microbial Reverse Electrolysis Cell (MRC) under Different Flow Rates
Usman GHANI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0243** Improve Microbial Fuel Cells Performance by Enhancing the Structure of Stainless Steel Current Collector
Usman GHANI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0244** Performance Evaluation of Microbial Fuel Cells with Different Configurations and Quantity of Anode
Usman GHANI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0245** Bacterial Communities of Microbial Fuel Cells in Responses to the External Resistance
Mohammad MAHASIN ALI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0246** Effects of Medium pH Changes on the Electrochemical Characteristics Behavior of a Microbial Fuel Cell
Mohammad MAHASIN ALI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0247** Effects of Different Electron Donors on Anode Bacterial Communities and Microbial Fuel Cells Performance
Mohammad MAHASIN ALI, Sokhee JUNG
Department of Environment and Energy Engineering, Chonnam National University, Gwangju, Korea
- P0248** Degradation of Oxytetracycline by Persulfate Activation Using Hand Warmer Waste
Eun Hea JHO¹, Youn Jun LEE², Chang-gu LEE²
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²Department of Environmental and Safety Engineering, Ajou University, Suwon, Korea
- P0249** Isolation of Antibiotics-degrading Soil Bacteria
Eun Hea JHO¹, Seon Hee KIM¹, Jinkyung HONG²
¹Department of Agricultural and Biological Chemistry, Chonnam National University, Gwangju, Korea,
²Department of Environmental Engineering, Yonsei University, Wonju, Korea
- P0250** Evaluation of Potential Distribution of *Melanoplus differentialis* by Using CLIMEX
Se-Hyun KIM¹, Wang-Hee LEE^{1,2}
¹Department of Smart Agriculture Systems, Chungnam National University, Daejeon, Korea, ²Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, Korea

- P0251** Biology-climate Based Assessment of *Procambarus clarkii* Distribution
 Dae-Hyeon BYEON¹, Sunghoon JUNG^{2,3}, Wang-Hee LEE^{1,3}
¹Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, Korea, ²Department of Applied Biology, Chungnam National University, Daejeon, Korea, ³Department of Smart Agriculture Systems, Chungnam National University, Daejeon, Korea
- P0252** Spatial Evaluation of Domestic Potential Distribution of Gypsy Moths (*Lymantria dispar*) in Response to Climate Change
 Jae-Woo SONG¹, Jae-Min JUNG¹, Youngwoo NAM², Sunghoon JUNG^{3,4}, Wang-Hee LEE^{1,4}
¹Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, Korea, ²Division of Forest Diseases and Insect Pests, National Institute of Forest Science, Seoul, Korea, ³Department of Applied Biology, Chungnam National University, Daejeon, Korea, ⁴Department of Smart Agriculture Systems, Chungnam National University, Daejeon, Korea
- P0253** Spatial Prediction of Occurrence Possibility of Pine Wilt Disease by Using MaxEnt Model
 Sunhee YOON¹, Jae-Min JUNG², Wang-Hee LEE^{1,2}
¹Department of Smart Agriculture Systems, Chungnam National University, Daejeon, Korea, ²Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, Korea
- P0254** Maximum Likelihood Estimation of Livestock Sensor Measurement with Probability Function
 Jae-Min JUNG, Wang-Hee LEE
 Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, Korea
- P0255** Fe₃O₄ Nanoparticle-mediated Hydrogen Fermentation for the Conversion of Potato Waste Biomass by Thermophilic *Parageobacillus thermoglucosidasius* Strain
 Mamata SINGHVI, Anoth MAHARJAN, Beom Soo KIM
 Department of Chemical Engineering, Chungbuk National University, Cheongju, Korea
- P0256** Polydimethylsiloxane Based Macro-antifouling
 Sejin LEE, Dong Soo HWANG
 POSTECH, Pohang, Korea
- P0257** Hydrothermal Liquefaction of Lignin to Bio-oil: Impact of Lignin Structure
 Ga-hee KIM, Byung-hwan UM
 Department of chemical engineering, Hankyong National University, Anseong, Korea
- P0258** A Simple and Facile Screening Method to Discover the Plastic Degrading Microorganisms
 Giyoung SHIN¹, Hyuni JUNG¹, Sung Yeon HWANG^{1,2}, Jeyoung PARK^{1,2}, Dongyeop X. OH^{1,2}
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합성생물공학 및 대사공학 (Synthetic Biology and Metabolic Engineering)

- P0301** Cloning and Heterologous Expression of Cryptic Biosynthetic Gene Clusters Involved in the Polyene Natural Product Biosynthesis from *Streptomyces rapamycinicus*
Hiyoung KIM, Uijin KIM, Chang-Hun JI, Ha Youn SHIN, Hahk-Soo KANG
Department of Biomedical Science and Engineering, Konkuk University, Seoul, Korea
- P0302** Promoter-optimized Cas9 Gene Enables Highly Efficient CRISPR/Cas9-based Genome Engineering in *Streptomyces*
Hyun-woo JE, Hi-young KIM, Chang-hun JI, Hahk-Soo KANG
Konkuk University, Seoul, Korea
- P0303** Titer Improvements of Clinically Important Antibiotic Daptomycin through Transcriptional Optimization of Biosynthetic Gene Cluster
Chang-Hun JI, Hiyoung KIM, Hyun-Woo JE, Hahk-Soo KANG
Dept. of Biomedical Science and Engineering, Konkuk University, Seoul, Korea
- P0304** Engineering and Enhancing Carotenoids Accumulation in Methylophilum, *Methylobacterium organophilum* DSM-760
Hawaibam Birla SINGH, Moonhyuk KWON, Seon-Won KIM
Division of Applied Life Science (BK21 Four), ABC-RLRC, PMBBRC, Gyeongsang National University, Jinju, Korea
- P0305** Effect of Galactose Operon Repressor Knockout Together with Other Genes Knockouts on the Carbon Source Consumption in *Escherichia coli*
Hyeon Jeong SEONG¹, Young-joon KO², Yu-Sin JANG¹
¹Division of Applied Life Science (BK21), Department of Applied Life Chemistry, Institute of Agriculture & Life Science (IALS), Gyeongsang National University, Jinju, Korea, ²Department of Agriculture Biology, National Institute of Agriculture Sciences, Rural Development Administration, Wanju, Korea
- P0306** Activation of Silent Biosynthetic Gene Clusters through *in vitro* CRISPR/Cas9 Refactoring
Boncheol GU, Min-Kyu OH
Department of Chemical & Biological Engineering, Korea University, Seoul, Korea
- P0307** Rational Engineering of PKS Modules for Neoareothin Derivatives Production
Dokyung KIM, Bonchoel GU, Minkyu OH
Department of Chemical & Biological Engineering, Korea University, Seoul, Korea
- P0308** Biosynthesis of L-ergothioneine by Regulating Sulfur Assimilation in Metabolically Engineered *Corynebacterium glutamicum*
Minhye KIM, Jun Won OH, Hyun Jin JEONG, Young Jin KO, Sung Ok HAN
Department of Biotechnology, Korea University, Seoul, Korea

- P0309** Improved Isopropanol Productivity by Using Lipid Metabolic Pathway in Oleaginous Yeast *Yarrowia lipolytica*
Xiaoyu SHI, Hyeon Min PARK, Myeong-Eun LEE, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0310** Engineering Heme Biosynthesis Pathway for Phycobilin Biosynthesis in *Corynebacterium glutamicum*
Joonhee CHANG, Young Jin KO, Minhye KIM, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0311** Strengthening Metabolic Bypasses for Enhanced Isopropanol Production in *Corynebacterium glutamicum*
Joy CHA, Young Jin KO, Myeong-Eun LEE, Sung Ok HAN
 Department of Biotechnology, Korea University, Seoul, Korea
- P0312** Flux Balance Model Based on Methanol Metabolism in Methylophilic Acetogen, *Eubacterium limosum* KIST612
Ji-Yeon KIM, Byeongchan KANG, Mungyu LEE, Soyoun OH, In Seop CHANG
 School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology, Gwangju, Korea
- P0313** Unprecedented Noncanonical Features in the WS9326A Nonribosomal Peptide Synthetase Assembly Line
Jung Min KIM¹, Myoun-Su KIM¹, Munhyung BAE¹, Ye-Eun JUNG², Jeong Sang YI¹, Sunghoon HWANG¹, Myoung Chong SONG¹, Yeon Hee BAN¹, Eun Seo BAE¹, Suckchang HONG³, Sang Kook LEE¹, Sun-Shin CHA², Dong-Chan OH¹, Yeo Joon YOON¹
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- P0314** Improvement of Lactate Tolerance in *Methylomonas* sp. DH-1 by a Mutation in AlaRS Increasing the Fidelity of Alanyl tRNA Synthesis
Wooyoung PARK, Ji-Sook HAHN
 School of Chemical and Biological Engineering, Seoul National University, Seoul, Korea
- P0316** High-level Production of Lycopene from Waste Biomass Using Metabolically Engineered Radiation-resistant Bacterium, *Deinococcus radiodurans* R1
Chang Keun KANG, Min Sun KIM, Yong Jun CHOI
 School of Environmental Engineering, University of Seoul, Seoul, Korea
- P0317** Photosynthetic Conversion of CO₂ to the Calorie-free Sweetener Precursor, Entkaurenoic Acid Using Engineered Cyanobacteria
Sung Cheon KO, Han Min WOO
 Department of Food Science and Biotechnology, Sungkyunkwan University (SKKU), Suwon, Korea

- P0318** The LC-MS/MS Based Multi-omics Analysis to Investigate *Clostridioides difficile* Infection Using *in vitro* Coculture Device, The Mimetic Intestinal Host-Microbe Interaction Coculture System, MIMICS
Ji-eun KWON, Sung-Huyn JO, Jae-Seung LEE, Hyo-Jin JEON, Ji-Hyeon PARK, Ye-Rim KIM, Min-Gyu KIM, Ji-Hyun BAEK, Yun-Gon KIM
Department of Chemical Engineering, Soongsil University, Seoul, Korea
- P0319** LC-MS/MS Based Multi-omics Approaches for Prebiotic Inulin Utilization on *Faecalibacterium prausnitzii*
Ji-Hyeon PARK, Sung-Hyun JO, Jae-Seung LEE, Hyo-Jin JEON, Ji-Eun KWON, Ye-Rim KIM, Ji-Hyun BAEK, Min-Gyu KIM, Yun-Gon KIM
Department of Chemical Engineering, Soongsil University, Seoul, Korea
- P0320** A Characterization of Inhibitory Responses to Adipogenesis and Lipogenesis in Adipocytes Induced by *Akkermansia muciniphila* via Multiomics Approach
Jae -Seung LEE, Sung-Hyun JO, Hyo-Jin JEON, Ji-Eun KWON, Ji-Hyeon PARK, Ye-Rim KIM, Ji-Hyun BAEK, Min-Gyu KIM, Yun-Gon KIM
Department of Chemical Engineering, Soongsil University, Seoul, Korea
- P0322** Proteomics and Metabolomics Based Characterization of Inhibition of Methicillin-resistant *Staphylococcus aureus* by *Lactobacillus* Isolates
Sung-Hyun JO, Hyo-Jin JEON, Jae-Seung LEE, Ji-Eun KWON, Ji-Hyeon PARK, Ye-Rim KIM, Min-Gyu KIM, Ji-Hyun BAEK, Yun-Gon KIM
Department of Chemical Engineering, Soongsil University, Seoul, Korea
- P0323** Metabolic Engineering of *Escherichia coli* for the Production of Polyhydroxyalkanoates with Hydroxyvaleric Acid Derived from Levulinic Acid
Doyun KIM¹, Sung Kuk LEE^{1,2}
¹Department of Biomedical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, ²School of Energy & Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea
- P0324** Dynamic Regulation to Improve Production of 3-hydroxypropionic Acid by Supplying Redox Cofactors
Yuchan KIM¹, Sung Kuk LEE^{1,2}
¹Department of Biomedical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, ²School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea
- P0325** Utilization of Cofactor Regeneration for Acceleration of Fatty Acid Overproduction
Taeseok KIM¹, Sungkuk LEE^{1,2}
¹School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, ²Department of Biomedical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea

- P0326** Characterization and Application of Embden-Meyerhof-Parnas Pathway-disrupted *Escherichia coli* for Production of 3-hydroxypropionic Acid
Kyung Hyun CHO¹, Young Shin RYU¹, Yuchan KIM², Sung Kuk LEE^{1,2}
¹Department of Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, ²Department of Biomedical Engineering, UNIST, Ulsan, Korea
- P0327** Production of 5-hydroxyvalerate-containing Polyhydroxyalkonates by Metabolically Engineered *Escherichia coli*
Yu Jung SOHN, Si Jae PARK
 Division of Chemical Engineering and Materials Science, Ewha Womans University, Seoul, Korea
- P0328** Production of GABA by Recombinant *Corynebacterium glutamicum* from Glucose Using Glutamate Decarboxylase Active at Neutral pH
Jina SON¹, Kei-Anne BARITUGO¹, Yu Jung SOHN¹, Kyoung Hee KANG², Hee Taek KIM³, Jeong Chan JOO⁴, Si Jae PARK¹
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- P0329** Production of Poly(3-hydroxybutyrate) from Glucose in *Pseudomonas putida* KT2440
Hye Min SONG, Hye Jin LIM, Si Jae PARK
 Department of Chemical Engineering and Materials Science, Graduate Program in System Health Science and Engineering, Ewha Womans University, Seoul, Korea
- P0330** Production of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) in *Methylosinus trichosporium* OB3b
Seo Young JO¹, Ji Yeon LEE¹, Seo Hyun LIM¹, Jeong-Geol NA², Si Jae PARK¹
¹Department of Chemical Engineering and Materials Science, Graduate Program in System Health Science and Engineering, Ewha Womans University, Seoul, Korea, ²Department of Chemical and Biomolecular Engineering, Sogang University, Seoul, Korea
- P0331** Production of Human Metabolites of Atorvastatin by Bacterial CYP102A1 Peroxygenase
Fikri Ainur Risma Hardiyanti OKTAVIA, Thi Huong Ha NGUYEN, Chul-Ho YUN
 School of Biological Sciences and Biotechnology, Graduate School, Chonnam National University, Gwangju, Korea
- P0332** Biosynthesis of Nicotinamide Mononucleotide through Metabolic Engineering of *Escherichia coli*
Anoth MAHARJAN, Mamata SINGHVI, Beom soo KIM
 Department of Chemical Engineering, Chungbuk National University, Cheongju, Korea

- P0333** Synthetic Microbial Consortia with Circuit-guided Population-guiding Strategy for Improving Biochemical Production
Chae Won KANG¹, Hyun Gyu LIM¹, Jaehyuk WON^{2,3}, Sanghak CHA¹, Giyoung SHIN⁴, Jae-Seong YANG⁵, Jaeyoung SUNG^{2,3}, Gyoo Yeol JUNG^{1,4}
¹Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea, ²Creative Research Initiative Center for Chemical Dynamics in Living Cells, Chung-Ang University, Seoul, Korea, ³Department of Chemistry, Chung-Ang University, Seoul, Korea, ⁴School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology, Pohang, Korea, ⁵Centre de Recerca en Agrigenòmica, Consortium CSIC-IRTA-UAB-UB, Cerdanyola del Vallès, Barcelona, Spain
- P0334** Evolutionary Strategy with an Aid of Biosensor for Violacein Production from Galactose
Da-ae GWON¹, Joo Yeon SEOK², Gyoo Yeol JUNG^{1,2}, Jeong Wook LEE^{1,2}
¹Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea, ²School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology, Pohang, Korea
- P0335** Enhanced Production of Isoprenoids through Precursor Rebalancing Strategy in *Escherichia coli*
Dong Hwan KIM¹, Ju Young JUNG², Jae Hyung LIM¹, Joo Yeon SEOK³, Gyoo Yeol JUNG^{1,3}
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- P0336** Novel Strategies for Optimization of L-Tryptophan Riboswitch for On-demand Application in *Escherichia coli*
Minsun KIM¹, Sungho JANG^{2,3,4}, Gyoo Yeol JUNG^{1,5}
¹School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology, Pohang, Korea, ²Department of Bioengineering and Nano-Bioengineering, Incheon National University, Incheon, Korea, ³Division of Bioengineering, College of Life Sciences and Bioengineering, Incheon National University, Incheon, Korea, ⁴Institute for New Drug Development, Incheon National University, Incheon, Korea, ⁵Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea
- P0337** Leveraging Evolutionary Protein Engineering for Efficient Production of Itaconate from Acetate
Jo Hyun MOON¹, Myung Hyun NOH², Hyun Gyu LIM², Jae-Seong YANG³, Gyoo Yeol JUNG^{1,4}
¹Department of Chemical Engineering, POSTECH, Pohang, Korea, ²UCSD, CA, USA, ³Centre for Research in Agricultural Genomics, Barcelona, Spain, ⁴i-bio, POSTECH, Pohang, Korea

- P0338** Efficient 3-hydroxypropionic Acid Production by Biosensor-based Evolutionary Engineering of Aldehyde Dehydrogenase
Myeongwon MIN¹, Joo Yeon SEOK¹, Hyun Gyu LIM², Sunghoon PARK³, Tae Hyeon YOO⁴, Gyoo Yeol JUNG^{1,2}
¹School of Interdisciplinary Bioscience and Bioengineering, POSTECH, Pohang, Korea, ²Department of Chemical Engineering, POSTECH, Pohang, Korea, ³School of Energy and Chemical Engineering, UNIST, Ulsan, Korea, ⁴Department of Molecular Science and Technology, Ajou University, Suwon, Korea
- P0339** Modified Reverse Transcription Loop-mediated Isothermal Amplification (RT-LAMP)
Soan PARK¹, Jeong Wook LEE^{1,2}
¹Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea, ²School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology, Pohang, Korea
- P0340** A Novel Marine Bacterium *Vibrio* sp. Dhg as a Promising Host Strain for Brown Macroalgae Refinery
Dongyeop BAEK¹, Hyun Gyu LIM¹, Dong Hun KWAK², Sungwoo PARK³, Sunghwa WOO¹, Jae-Seong YANG¹, Chae Won KANG¹, Beomhee KIM³, Myung Hyun NOH¹, Sang Woo SEO³, Gyoo Yeol JUNG^{1,2}
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- P0341** Kinetic Separation in *Escherichia coli* by Developing Non-native Enzyme for Itaconate Production
Daeyeol YE¹, Myung Hyun NOH¹, Johyun MOON¹, Jeong Wook LEE¹, Jae-Seong YANG², Gyoo Yeol JUNG¹
¹Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea, ²Centre for Research in Agricultural Genomics, Autonomous University of Barcelona, Cerdanyola, Barcelona, Spain
- P0342** Isothermal, One-pot Fluorescence Detection of Pathogen-derived RNAs Based on Cell-free Synthetic Biology
Chang Ha WOO¹, Sungho JANG², Giyoung SHIN¹, Gyoo Yeol JUNG^{1,2}, Jeong Wook LEE^{1,2}
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- P0343** Plug-in Repressor Library for Fine-tuning of Metabolic Flux in *Escherichia coli*
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P0344 Design and Evaluation of Synthetic RNA-based Incoherent Feed-forward Loop Circuits

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P0345 Development of Coenzyme B12 Riboswitch-based Sensor Coupled with Transcriptional Repressor for Signal Reversal and Amplification

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P0346 Metabolic Engineering of *Corynebacterium glutamicum* for the Efficient Production of a Natural Blue Pigment Indigoidine as a Sustainable Fabric Dye

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P0347 Development of a Deep Learning Model for Predicting the Effects of Cultivation Condition on Gene Expression Levels in *Escherichia coli*

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P0348 Transcriptome Analysis of *Calliphora vicina*, *Lucilia illustris*, and *Sarcophaga kanoi* (Insecta, Diptera) Isolated in South Korea

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P0349 Metabolic Engineering of *Corynebacterium glutamicum* for 4-amino-1-butanol Production

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P0350 CRISPR/Cas9-coupled Recombineering for Efficient Metabolic Engineering of *Corynebacterium glutamicum*

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P0351 Systems Metabolic Engineering of an L-lysine-overproducing *Corynebacterium glutamicum* for Glutaric Acid Production

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P0352 Microbial Production of a Grape Flavor Compound, Methyl Anthranilate (MANT)

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P0353 Prediction of Transcription Factors Using a Deep Learning-based Tool, DeepTFactor

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P0354 Metabolic Engineering of *Escherichia coli* for Production of Rainbow Colorants
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P0355 Metabolic Engineering of *Escherichia coli* for Production of Carminic Acid
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P0356 Systems Metabolic Engineering for the Production of Aromatic Polyester from *Escherichia coli*

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P0357 Production and Application of Fully Bio-based and Biodegradable Nylon-4,4 and -5,4

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- P0358** Increased Succinic Acid Production by *Mannheimia succiniciproducens* Employing Optimal Malate Dehydrogenase
 Jung Ho AHN^{1,2,3}, Hogyun SEO^{4,5}, Woojin PARK^{4,6}, Jihye SEOK^{4,6}, Jong An LEE^{1,2,3}, Won Jun KIM^{1,2,3}, Gi Bae KIM^{1,2,3}, Kyung-Jin KIM^{4,6}, Yeah-Ji AHN^{1,2,3}, Sang Yup LEE^{1,2,3}
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- P0359** Engineered *Escherichia coli* Capable of Growing on Only CO₂ and Formic Acid
 Junho BANG^{1,2}, Chang Hun HWANG^{1,2}, Jung Ho AHN^{1,2}, Jong An LEE^{1,2}, Yeah-Ji AHN^{1,2}, Sang Yup LEE^{1,2,3}
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- P0360** Oxyfunctionalization of Citrus Flavonoids by Monophenol Monooxygenase
 Gun Su CHA¹, Chan Mi PARK²
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- P0361** The Establishment of Plasmid Vectors for Producing Rhamnolipids in *Escherichia coli*
 Young-Joon KO, Jeong-Seon KIM, Da-Hye KIM, Soo-Jin KIM
 Agricultural Microbiology Division, National Institute of Agricultural Sciences, Rural Development Administration, Wanju, Korea
- P0362** Engineering Efflux Protein Expression Levels to Increase N-butanol Tolerance and Production in *Escherichia coli*
 Min-Kyoung KANG^{1,2}, Sergey BOYARSKIY², Michael A FISHER², Danielle TULLMAN-ERCEK², Seon-Won KIM¹
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- P0363** Increased Retinoids Production in Recombinant *E. coli* through Addition of Glyoxylic Acid
 Ji-Bin PARK, Seong-Hee JEONG, Moonhyuk KWON, Seon-Won KIM
 Division of Applied Life Science (BK21 Four), ABC-RLRC, PMBBRC, Gyeongsang National University, Jinju, Korea

P0364 Sequential Whole-cell Conversion Process for Economical Production of D-psicose and D-mannitol in *Corynebacterium glutamicum*

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P0365 Identifying the Causes of D-xylonate Accumulation in *Escherichia coli* Utilizing Xylose Oxidative Pathway for Better Metabolic Engineering Approaches

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P0366 Enhanced Production of Glycolic Acid in *Escherichia coli* through Co-utilization of L-arabinose and D-xylose

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P0367 Development of Efficient Glycolic Acid-producing *E. coli* Strain Co-utilizing D-xylose and Cellobiose through Metabolic and Evolutionary Engineering

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P0368 Voltage Based Gene Tuning in the Bioelectrochemical System: Overexpression of Reporter Gene with FPR as Redox Sensor Promoter

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P0369 Enhancing Soluble Expression of ChCODH by Optimization of Culture Condition and Chaperon Protein Co-expression in Engineered *Escherichia coli*

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P0370 Novel Strategy for Malic Acid Production in Recombinant *Escherichia coli* via Protein Colocalization

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P0371 Development of Fenitrothion Removing Recombinant *Escherichia coli* by the Cell Surface Display of Pesticide-binding Peptide

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- P0372** Nucleic Acid-based Gene Regulators as Biosensors for Metabolic Engineering and Molecular Diagnosis
Sungho JANG^{1,2,3}
¹Department of Bioengineering and Nano-Bioengineering, Incheon National University, Incheon, Korea, ²Division of Bioengineering, Incheon National University, Incheon, Korea, ³Institute for New Drug Development, Incheon National University, Incheon, Korea
- P0373** Biocatalytic Production of 3-OH Phlorizin by CYP102A1 via Regioselective Hydroxylation
Ngoc Anh NGUYEN, Ngoc Tan CAO, Jeong-Hoon KIM, Chul-Ho YUN
 School of Biological Sciences and Biotechnology, Graduate School, Chonnam National University, Gwangju, Korea
- P0374** A Novel Statin Compound from Monacolin J Produced by CYP102A1- catalyzed Regioselective C-hydroxylation
Ngoc Tan CAO, Ngoc Anh NGUYEN, Chan-Mi PARK, Chul-Ho YUN
 School of Biological Sciences and Biotechnology, Graduate School, Chonnam National University, Gwangju, Korea
- P0375** Whole-cell Biocatalysis of Phloretin 3-hydroxylation by CYP102A3 Enzyme from *Bacillus subtilis*
Jeong-Hoon KIM, Ngoc Anh NGUYEN, Chul-Ho YUN
 School of Biological Sciences and Biotechnology, Graduate School, Chonnam National University, Gwangju, Korea
- P0376** Production of Catechol Metabolite of Rhododendrol by Mushroom Tyrosinase
Chan Mi PARK¹, Hyun Seo PARK¹, Gun Su CHA², Chul-Ho YUN¹
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- P0377** The Expression of DDX3 by Receptor in Neuronal Cells
Youngseo PARK, Junho LEE
 Department of Biotechnology, Chonnam National University, Gwangju, Korea
- P0378** Detection of Pks Island mRNAs Using Toehold Sensors in *Escherichia coli*
Hansol KANG, Taeyang HEO, Jongmin KIM
 Department of Life Sciences, Pohang University of Science and Technology, Pohang, Korea
- P0379** High-throughput Screening and Selection of Artificial Lactam Riboswitch
Junyeong SUNG¹, Sungyeon JANG¹, Sungho JANG¹, Dae-Kyun IM², Teak jun KANG³, Min-Kyu OH², Gyoo Yeol JUNG¹
¹POSTECH, Pohang, Korea, ²Korea University, Seoul, Korea, ³Dongguk University, Seoul, Korea

- P0380** Engineering of Glyoxylate Cycle for Efficient Tyrosine Production from Acetate in *Escherichia coli*
Gyoo Yeol JUNG^{1,2}, Minji JO¹, Myung Hyun NOH², Hyun Gyu LIM², Chae Won KANG²,
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- P0381** Cellular Arithmetic Logic Unit Using Toehold Switches
Seungdo CHOI, Geonhu LEE, Jongmin KIM
Department of Life Sciences, Pohang University of Science and Technology, Pohang, Korea
- P0382** Synthetic Metabolic Pathways for the Biosynthesis of Four-, Five- and Six-carbon Lactams
Tong Un CHAE, Yoo-Sung KO, Kyu-Sang HWANG, Sang Yup LEE
Department of Chemical and Biomolecular Engineering (BK21 Four program), BioProcess Engineering Research Center, Institute for the BioCentury, KAIST, Daejeon, Korea
- P0383** Efficient Production of Fatty Acids and Fuels by Metabolically Engineered *Rhodococcus opacus* Strains
Hye Mi KIM¹, Tong Un CHAE¹, So Young CHOI¹, Won Jun KIM¹, Sang Yup LEE^{1,2}
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- P0384** Engineering of *Escherichia coli* for the Efficient Production of Ethylene Glycol from Xylose
Tong Un CHAE, So Young CHOI, Jae Yong RYU, Sang Yup LEE
Department of Chemical and Biomolecular Engineering (BK21 Four program), BioProcess Engineering Research Center, Institute for the BioCentury, KAIST, Daejeon, Korea
- P0385** Comparative Analysis of the Bioplastic Polyhydroxyalkanoate (PHA) Accumulation in Native and Recombinant Bacteria via 3D Holotomography
So Young CHOI¹, Jeonghun OH², JaeHwang JUNG², YongKeun PARK^{2,3}, Sang Yup LEE^{1,4}
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- P0386** Transformation of Chemical Plastic Synthesis into Microbial Bioplastic Synthesis via Systems Metabolic Engineering
So Young CHOI¹, Sang Yup LEE^{1,2}
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P0387 Biosynthesis of the Promising Medical Bioplastic Poly(lactate-co-glycolate-co-4-hydroxybutyrate) [PLGA-4HB] from Renewable Biomass

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나노바이오공학 (Nano-Bioengineering)

- P0401** Light-up Aptamer Amplification Assay for Quantification of ATP
Ha-Yeong LEE^{1,2}, Deok-Gyu LEE¹, Ju-Young BYUN¹, Yong-Beom SHIN^{1,2,3}
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- P0402** Histidine Coated Magnetic Nanoparticles as Peroxidase-like Nanozyme for Sensitive Fluorescent Detection of Acetylcholine
Kang Jin LEE, Hong Jae CHEON, Moon Il KIM
Department of BioNano Technology, Gachon University, Seongnam, Korea
- P0403** Exosome Isolation Technology Using Chitosan-coated Magnetic Nanoparticles
Chiyeon SONG^{1,2}, Jihye KIM^{1,2}, Heewon AN^{1,2}, Hyewon KIM¹, Sojin SHIN¹, Sang Hoon LEE^{1,3}, Jung Taek KANG³, Hyun-Ouk KIM^{1,2}
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- P0404** Activatable Polymersome for Oral Delivery of Vaccines
Yurim AHN^{1,2}, Seojin KIM¹, Minse KIM¹, Jaewon CHOI^{1,2}, Jiyeon PARK^{1,2}, HakSeon KIM¹, Hyun-Ouk KIM^{1,2}
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- P0405** High-resolution Patterning of Gold Binding Peptide Fused Glucose Dehydrogenase Gamma-alpha Complex (GDH $\gamma\alpha$) on Electrode Surface
Hyeryeong LEE, Stacy Simai REGINALD, Taehoon YI, In Seop CHANG
School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology, Gwangju, Korea
- P0406** Hydrogel Microcapsules with a Thin Oil Layer for Programmable Release via Diverse Stimuli
Hye-Seon JEONG¹, Eunseo KIM², Hyomin LEE², Chang-Hyung CHOI¹
¹Division of Cosmetic Science and Technology, Daegu Haany University, Gyeongsan, Korea, ²Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea
- P0407** Hydrogen Peroxide Biosensor Based on Horseradish Peroxidase Encapsulated Protein Nanoparticles Immobilized on Reduced Graphene Oxide-modified Gold Electrode
Jeong-Hyeop SHIN, Ji-Ae SONG, Byung-Keun OH
Department of Chemical and Biomolecular Engineering, Sogang University, Seoul, Korea

- P0408** Development of Gold Nanocluster Embedded Dual-enzyme Nanoparticles and their Applications in an Enzyme-based High-sensitive Glucose Electrochemical Sensor
Myeong-Jun LEE, Yeong-Joong KIM, Jeong-Hyeop SHIN, Byung-keun OH
 Department of Chemical & Biomolecular Engineering, Sogang University, Seoul, Korea
- P0409** Production of ACE2-derived Peptides in *E. coli* for the Inhibition of Spike Glycoprotein of SARS-CoV-2
SooBeen LEE¹, Jin YOO¹, TaiHyun PARK^{1,2}
¹School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, Korea, ²Interdisciplinary Program for Bioengineering, Seoul National University, Seoul, Korea
- P0410** Fabrication of Overgrown Gold Nanoparticles in Hydrogel for Light-responsive Drug Delivery
Doyun KIM, Seungki LEE, Inhee CHOI
 Department of Life Science, University of Seoul, Seoul, Korea
- P0411** Ultrasensitive Optical Detection of Reactive Oxygen Species Using Plasmonic-graphene Hybrid Interface
Hakchun KIM¹, Hyun Ji AN¹, Junhee PARK¹, Yohan LEE², Seungki LEE¹, Ji Hyeon OH¹, Nam Dong KIM³, Jihwan SONG², Inhee CHOI¹
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- P0412** Development of Fc-conjugated Nanodisc for Enhanced Virucidal Efficacy against Influenza A Viruses
KyeongWon KIM, Jaehyeon HWANG, Younghun JUNG, Jeong Hyeon YOON, Soomin KIM, Nayoon CHOI, Dae-Hyuk KWEON
 Department of Integrative Biotechnology, Sungkyunkwan University, Suwon, Korea
- P0413** Development of End-spliced Dimeric Nanodiscs for the Improved Virucidal Activity of a Nanoperforator
Mi Soo KIM¹, Hyunseok OH¹, Seokoh MOON¹, Soomin KIM¹, Jeonghui MOON¹, NaYeon KIM¹, Dae-Hyuk KWEON^{1,2}
¹Department of Integrative Biotechnology, College of Biotechnology and Bioengineering, Sungkyunkwan University, Suwon, Korea, ²Biomedical Institute for Convergence, Sungkyunkwan University, Suwon, Korea
- P0414** Bioinspired Synthesis of Hierarchical Silica Nanocage Using an Engineered Capsid Protein
Kyeong Rok KIM¹, Chang Sup KIM^{1,2}
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- P0415** Bioinspired Synthesis of Micelle-templated Silica Nanocapsules for Biocatalysts
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- P0416** Highly Sensitive Detection of MicroRNA Using Isothermal Amplification and Toehold-mediated Strand Displacement
Dain KIM¹, Jiyoung LEE², Taeun LEE², Eunjung KIM^{1,2}
¹Department of Bioengineering and Nano-Bioengineering, Incheon National University, Incheon, Korea, ²Division of Bioengineering, Incheon National University, Incheon, Korea
- P0417** Electrophysiological Properties of Hypothalamus Neurons
June woo NA¹, Byong Seo PARK², Jae Geun KIM², Sunggu YANG¹
¹Department of biotechnology and Nano-bioengineering, Incheon National University, Incheon, Korea, ²Division of Life Sciences, College of Life Sciences and Bioengineering, Incheon National University, Incheon, Korea
- P0418** Epidural Electrotherapy for Epilepsy
Hyerin JEONG¹, Sung-Won PARK^{1,2}, Jejung KIM², Minpyo KANG², Wonho LEE², Byong Seo KIM¹, Hansung KIM¹, Se-Young CHOI³, Sungchil YANG⁴, Jong-Hyun AHN², Sunggu YANG¹
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- P0419** Development of Fluorescent Temperature Sensors Using Luminescent Electrospun Nanofibers
Juyeon KIM, Jongyeon NA, Byeongeun KIM, Jong Il RHEE
School of Chemical Engineering, Chonnam National University,
- P0420** Electrochemical Detection of Influenza H5N1 Virus Antigen Based on Biomimetic Affinity Peptide
Ji Hong KIM¹, Chae Hwan CHO¹, Jae Hwan SHIN¹, Yenugu Veera MANOHARA REDDY¹, Tae Jung PARK², Jong Pil PARK¹
¹Department of Food Science and Technology, Chung-Ang University, Anseong, Korea, ²Department of Chemistry, Institute of Interdisciplinary Convergence Research, Research Institute of Chem-Bio Diagnostic Technology, Chung-Ang University, Seoul, Korea
- P0421** Electrochemical Detection of Caspase-3 Based on Chemically Modified Whole Phage
Jae Hwan SHIN¹, Ji Hong KIM¹, Chae Hwan CHO¹, Hyo Jeong YANG¹, Oleg IVANOV², Tae Jung PARK³, Jong Pil PARK¹
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- P0422** MicroRNA Detection Using Nuclease Protection Assay and Transcription-assisted Light-up Aptamer Amplification
YoonSeo HONG^{1,2}, Ha-Yeong LEE^{1,3}, Dong-Myung KIM², Ju-Young BYUN¹, Yong-Beom SHIN^{1,2,4}
¹Bionanotechnology Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Daejeon, Korea, ²Department of Chemical Engineering and Applied Chemistry, Chungnam National University, Daejeon, Korea, ³Department of Nanobiotechnology, KRIBB School of Biotechnology, University of Science and Technology, Daejeon, Korea, ⁴BioNano Health Guard Research Center (H-GUARD), Daejeon, Korea
- P0423** Rapid Detection of Protein/Small Molecule Interaction Using CRISPR/Cas12a Collateral Cleavage Activity
Hansol KIM, Kiyoung PARK, Youngran CHO, Ho Don JEONG, Hyun Gyu PARK
 Department of Chemical and Biomolecular Engineering (BK 21+ program), KAIST, Daejeon, Korea
- P0424** A Label-free and Washing-free Method for the Detection of Creatine Kinase Activity Using Personal Glucose Meter
Jinhwan LEE, Sunghyeon KIM, Sungjun YOON, Hyun Gyu PARK
 Department of Chemical and Biomolecular Engineering, KAIST, Daejeon, Korea
- P0425** Cytochrome c-conjugated Graphene Field-effect Transistor-based Biosensor for H₂O₂ Monitoring
Kyung Ho KIM^{1,2}, Kyung Jin LEE², Oh Seok KWON¹
¹Infectious Disease Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Daejeon, Korea, ²Department of Chemical Engineering and Applied Chemistry, College of Engineering, Chungnam National University, Daejeon, Korea
- P0426** Development of Isothermal Amplification-based Lateral Flow Biosensors for High-sensitive *in vitro* Diagnosis (IVD) of Gastric Cancer-associated MicroRNAs
Seung-Beom SEO^{1,2}, Jin-Seong HWANG^{3,4}, Tae-Su HAN^{3,4}, Eun-Kyung LIM^{1,5}
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- P0427** Highly Sensitive Stress Biomarker Detecting Polypyrrole Nanotube Coupled with Field-effect Transistor
Jai Eun AN, Oh Seok KWON
 Infectious Disease Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Daejeon, Korea

- P0428** Polydiacetylene-based Bead Gels as Colorimetric Sensor for Biogenic Amines Detection in Spoiled Food
Soojin JANG^{1,2}, Sungbaek SEO³, Eun-Kyung LIM^{1,2}
¹BioNanotechnology Research Center, KRIBB, Daejeon, Korea, ²Department of Nanobiotechnology, KRIBB School of Biotechnology, Daejeon, Korea, ³Department of Biomaterials Science (BK21 FOUR Program), College of Natural Resources and Life Science / Life and Industry Convergence Research Institute, Pusan National University, Miryang, Korea
- P0429** Microfluidics Mixer Platform for Efficient Fluorescent Labeling of Microplastics
Seongcheol SHIN, Hyun ho LEE, Seungju OH, Hyeyeon HUR, Jongmin YANG, Dhanashri DESAI, Gillhwan KIM, Chorong KIM
Department of Chemical Engineering, Myongji University, Yongin, Korea
- P0430** Microfluidic Microplastics Trap Module for Detection by Fluorescent Staining
Seongcheol SHIN, Hyun Ho LEE, Seungju OH, Hyeyeon HUR, Jongmin YANG, Dhanashri DESAI, Gillhwan KIM, Chorong KIM
Department of Chemical Engineering, Myongji University, Yongin, Korea
- P0431** Sensitive Detection of Nucleic Acid Biomarkers Using Transcription Mediated Isothermal Amplification
Tachwi YOON, Seokjoon KIM, Jiye SHIN, Ki Soo PARK
Biological Engineering, Konkuk University, Seoul, Korea
- P0432** Design of Protein Nanocages for Extending Protein Half-life with Functional Moiety
Na Yeon KIM, Eun Jung LEE, Hyo-Dong SUNG, Da Yeon KANG
Department of chemical engineering, Kyungpook National University, Daegu, Korea
- P0433** Fabrication of Below 50 nm Bio-silica Particles Using Ferritin Template Modified with Silica-forming Peptide at C-terminal
Thi Khoa My NGUYEN, Mi Ran KI, Ryeo Gang SON, Kyung Hee KIM, Jin Woo SHIN, Seung Pil PACK
Department of Biotechnology and Bioinformatics, Korea University, Sejong, Korea
- P0434** Comprehensive Observation of Size-dependent Effect of Polyethylene Glycol on the Self-assembly of DNA Nanostructure
Myong Jin LEE, Eui Kyong JANG, Seung Pil PACK
Department of Biotechnology and Bioinformatics, Korea University, Sejong, Korea
- P0435** Glucose Biosensor Based on Au Film Electrode Modified with Glucose Oxidase Immobilization on Mediator
Dong Sup KIM¹, Xiaoguang YANG², Han Suk CHOI², Chulhwan PARK³, Seung Wook KIM², Jingyoung LEE¹
¹Department of Green Chemical Engineering, Sangmyung University, Cheonan, Korea, ²Department of Chemical and Biological Engineering, Korea University, Seoul, Korea, ³Department of Chemical Engineering, Kwangwoon University, Seoul, Korea

- P0436** Fabrication of Human Brain-spinal Cord Assembloid for Electrophysiological Monitoring of Neurochemical-based Neural System Crosstalk
Taehyeong HA¹, Joohyung SON¹, Soo Jeong PARK¹, Hyeon-Yeol CHO², Jeong-Woo CHOI¹
¹Department of Chemical & Biomolecular Engineering, Sogang University, Seoul, Korea, ² Department of Bio & Fermentation Convergence Technology, Kookmin University, Seoul, Korea
- P0437** Enlarged Nano-perforator as Efficient, Stable, and Broadly Acting Antiviral Agent
Jeong Hyeon YOON¹, Younghun JUNG², Jaehyeon HWANG¹, KyeongWon KIM¹, YoungSeo PARK¹, Suhyun KIM¹, Dae-Hyuk KWEON^{1,2}
¹Department of Integrative Biotechnology, Sungkyunkwan University, Suwon, Korea, ²Institute of Biomolecular Control, Sungkyunkwan University, Suwon, Korea
- P0438** A Novel Antifungal Activity of Vip3Aa Protein against *Candida* Species
Jin-Young KIM, Mi-Kyeong JANG
 Department of chemical Engineering, Suncheon National University, Suncheon, Korea
- P0439** Candidacidal Activity of PS1-3 Peptide against Drug-resistant *C. albicans*
Jong-Kook LEE¹, Soyoung PARK², Mi-Kyeong JANG¹
¹Department of Chemical Engineering, Suncheon National University, Suncheon, Korea, ²Department of Polymer Science and Engineering, Suncheon National University, Suncheon, Korea
- P0440** Pomegranate Pericarp Extract Functionalized Zinc Oxide Nanocomposite for Antioxidant and Antibacterial Properties
Sang Gu KANG¹, Kyung Eun LEE^{1,2}, Mahendra SINGH¹, Ramachandran VINAYAGAM¹
¹Department of Biotechnology, Institute of Biotechnology, College of Life and Applied Sciences, Yeungnam University, Gyeongsan, Korea, ²Stemforce, 313 Institute of Industrial Technology, Yeungnam University, Gyeongsan, Korea
- P0441** Simple Colorimetric Detection System of MicroRNA Using DNA-conjugated Gold Nanoparticles
Jiyoung LEE¹, Dain KIM², Taeun LEE¹, Eunjung KIM^{1,2}
¹Division of Bioengineering, Incheon National University, Incheon, Korea, ²Department of Bioengineering and Nano-Bioengineering, Incheon National University, Incheon, Korea
- P0442** Quantitative Lateral Flow Immunoassay for Rapid and Sensitive Detection of Histamine in Fish
Munirah ALHAMMADI, Min Ji LEE, Yun Suk HUH
 Department of Biological Engineering, Inha University, Incheon, Korea
- P0443** Instant Colorimetric Sensing of Artificial Fruit Ripening Agents on Fruit Skin via Enzymatic Chemoreceptor
Sonam SONWAL, Yun Suk HUH
 Department of Biological Engineering, Inha University, Incheon, Korea
- P0444** Optimization of Hypoxia Degradation Albumin Based Nanoparticle
Suheon KIM, Hoomin LEE, Kwanwoo KIM, Eunsu KIM, Yun Suk HUH
 Department of Biological Engineering, NanoBio High-Tech Materials Research Center, Inha University, Incheon, Korea

- P0445** Biogenic Gold Nanozyme Possessing Glucose Oxidase and Peroxidase Activity
Aarti Rajendra DESHMUKH, Beom Soo KIM
Department of Chemical Engineering, Chungbuk National University, Cheongju, Korea
- P0446** High Performance of NanoCellulose/Nanochitin Coating Polypropylene Film for Food Packaging Materials
Seunghyeon LEE, Dongsoo HWANG
Department of Environment Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea
- P0447** Microfluidic Device for One-step Detection of Breast Cancer-derived Exosomal mRNA in Blood Using Signal-amplifiable 3D Nanostructure
Jaewoo LIM, Byunghoon KANG, Eun-Kyung LIM
Bionanotechnology Research Center, Korea research institute of bioscience and biotechnology (KRIBB), Daejeon, Korea

미생물공학 및 생물공정공학 (Microbial and Bioprocess Engineering)

- P0501** Adaptive Laboratory Evolution (ALE) of *Clostridium* sp. JS66 on Carbon Monoxide
Kyoung Won MUN^{1,2}, Ki-Yeon KIM¹, Kyoung Heon KIM², Youngsoon UM^{1,3}
¹Clean Energy Research Center, Korea Institute of Science and Technology (KIST), Seoul, Korea,
²Department of Biotechnology, Korea University, Seoul, Korea, ³Clean Energy and Chemical
 Engineering, Korea University of Science and Technology, Daejeon, Korea
- P0502** Enhanced Hexanoic Acid Production of *Clostridium* sp. JS66 Using *in situ* Removal
 of Hexanoic Acid and High CO Pressure through Mixotrophic Fermentation
Deurim YUN^{1,2}, Young Soon UM¹, Sung Ok HAN²
¹Clean Energy Research Center, Korea Institute of Science and Technology (KIST), Seoul, Korea,
²Department of Biotechnology, Korea University, Seoul, Korea
- P0503** Overexpression of Acetyl CoA Carboxylase1 and Malonyl CoA Reductase for
 the Production of 3-hydroxypropionic Acid by an Engineered *Kluyveromyces*
marxianus
Kyoung-Gon KANG^{1,2}, Deok-Ho KWON^{1,2,3}, Suk-Jin HA^{1,2,3}
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 Chuncheon, Korea, ²Department of Bioengineering and Technology, Kangwon National University,
 Chuncheon, Korea, ³Institute of Fermentation and Brewing, Kangwon National University, Chuncheon,
 Korea
- P0504** Comparisons of Simultaneous Saccharification and Fermentation Using Fungi
 Isolated from *Nuruk*
Seong-Hwan YEOM¹, Deok-Ho KWON^{1,2,3}, Myoung-Dong KIM^{2,4}, Suk-Jin HA^{1,2,3}
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 Korea, ³Department of Bioengineering and Technology, Kangwon National University, Chuncheon,
 Korea, ⁴Department of Food Science and Biotechnology, Kangwon National University, Chuncheon,
 Korea
- P0505** Enhancement of Photoautotrophic Algal Biomass Production after Interrupted CO₂
 Supply by Urea and KH₂PO₄ Injection
Ju Yeon LEE, Byung Sun YU, Sang Jun SIM
 Department of Chemical and Biological Engineering, Korea University, Seoul, Korea
- P0506** Concurrent Enhancement of CO₂ Fixation and Productivities of Omega-3 Fatty
 Acids and Astaxanthin in *Haematococcus pluvialis* Culture via Calcium-mediated
 Homeoviscous Adaptation and Biomineralization
Ji Young LEE, Byung Sun YU, Sang Jun SIM
 Department of Chemical and Biological Engineering, Korea University, Seoul, Korea
- P0507** Ultrasonic Cavitation Bubble- and Gas Bubble-assisted Rapid and Enhanced
 Adsorption of Paclitaxel from *Taxus chinensis* onto Sylopute
Da-Yeon KANG, Jin-Hyun KIM
 Dept. of Chemical Engineering, Kongju National University, Cheonan, Korea

- P0508** Ultrasound-assisted Extraction of Paclitaxel from *Taxus chinensis*: Optimization, Kinetics and Mechanism Studies
Hak-Gyun KIM, Jin-Hyun KIM
Dept. of Chemical Engineering, Kongju National University, Cheonan, Korea
- P0509** Negative Pressure Cavitation Bubble-induced Fractional Precipitation of Paclitaxel from *Taxus chinensis*
Hye-Su MIN, Jin-Hyun KIM
Dept. of Chemical Engineering, Kongju National University, Cheonan, Korea
- P0510** Effect of Temperature and Solvents on Enzymatic Synthesis of Naringin Oleate
Kyeonga KIM, Jonghwa LEE, Seungmee LEE, Jemin SON, Suhwan JI, Chulhwan PARK
Department of Chemical Engineering, Kwangwoon University, Seoul, Korea
- P0511** Effects of Enzyme Type and Molar Ratio on Enzymatic Synthesis of Hydroxybutyrate Methyl Ester
Jemin SON¹, Kyeonga KIM¹, Seungmee LEE¹, Hah Young YOO², Chulhwan PARK¹
¹Department of Chemical Engineering, Kwangwoon University, Seoul, Korea, ²Department of Biotechnology, Sangmyung University, Seoul, Korea
- P0512** Effect of Temperature and Solvents on Enzymatic Synthesis of Naringin Acetate
Seungmee LEE¹, Yesol BAEK¹, Jemin SON¹, Kyeonga KIM¹, Hyeseon LEE¹, Hah Young YOO², Jong-Min OH³, Chulhwan PARK¹
¹Department of Chemical Engineering, Kwangwoon University, Seoul, Korea, ²Department of Biotechnology, Sangmyung University, Seoul, Korea, ³Department of Electronic Materials Engineering, Kwangwoon University, Seoul, Korea
- P0513** Increased Antibacterial Effect of Oxacillin against Methicillin-resistant *Staphylococcus aureus* by Ricini Semen
Minjun KIM, Seon-Gyeong KIM, Yena SEO, Yedam CHOI, Tae-Jong KIM
Department of Forest Products and Biotechnology, Kookmin University, Seoul, Korea
- P0514** Bioconversion of Crude Glycerol by Using Electrochemically Active Strain, *Klebsiella Pneumoniae* L17 with ZVI
Da Seul KONG¹, Changman KIM², Eun Joo PARK¹, Jung Rae KIM¹
¹School of Chemical and Biomolecular Engineering, Pusan National University, Busan, Korea, ²Advanced Biofuel and Bioproducts Process Development Unit, Lawrence Berkeley National Laboratory, Emeryville, CA, USA
- P0515** Increased Binding Efficiency of Enzyme Complex Based on Biomimicry Technology of Microorganisms
Habin SUN, JeongEun HYEON
Department of Food Science and Biotechnology, College of Knowledge-Based Services Engineering, Sungshin Women's University, Seoul, Korea

- P0516** Evaluation of Enzyme Activity and Development of Enzyme Used for Astaxanthin Extraction from *Xanthophyllomyces dendrorhous*
YouKyeong LEE, JeongEun HYEON
 Department of Food Science and Biotechnology, College of Knowledge-Based Services Engineering, Sungshin Women's University, Seoul, Korea
- P0517** Application, Characterization and Antioxidant Activities of Natural Pigment Produced by *Deinococcus wulumqiensis* Strain
SeoA PARK, Minbeen JEONG, Kwon-Young CHOI
 Ajou university, Suwon, Korea
- P0518** Enhancement of Fatty Acids Production of *Parachlorella kessleri* by Box-Behnken Design
Han-Bin RYU, Seonghoon YOON, Joo-Hee BAE, Mi-Jin KANG, Seong-Joo HONG, Choul-Gyun LEE
 Department of Biological Sciences and Bioengineering, Department of Biological engineering, Inha University, Incheon, Korea
- P0519** Production of Trehalose Using Trehalose Synthase on the *Escherichia coli* Cell Surface
Kyung Min KIM¹, Sun Jung KIM², Je Ha OH², Seung Hwan LEE^{1,2}
¹Interdisciplinary Program of Bioenergy and Biomaterials Graduate School, Chonnam National University, Gwangju, Korea, ²Department of Biotechnology and Bioengineering, Chonnam National University, Gwangju, Korea
- P0520** Immobilization and Characterization of Hydrolases on Porous Titanium Dioxide (TiO₂) Support
Hye Won JO¹, Kwang Yeol PARK², Young Woo SHIN³, Hyeon Gyu CHOI³, Chang Hyun KO², Seung Hwan LEE^{1,3}
¹Interdisciplinary Program of Bioenergy and Biomaterials Graduate School, Chonnam National University, Gwangju, Korea, ²School of Chemical Engineering, Chonnam National University, Gwangju, Korea, ³Department of Biotechnology and Bioengineering, Chonnam National University, Gwangju, Korea
- P0521** Heterologous Expression of Phleichrome, a Product of Polyketide Synthase of *Cladosporium phlei*, Using Co-expression System in *Saccharomyces cerevisiae*
Hee-Won SEO¹, Kum-Kang SO², Jeesun CHUN², Dae-Hyuk KIM^{1,2,3}
¹Department of Bioactive Material Sciences, Jeonbuk National University, Jeonju, Korea, ²Institute for Molecular Biology and Genetics, Jeonbuk National University, Jeonju, Korea, ³Department of Molecular Biology, Jeonbuk National University, Jeonju, Korea
- P0522** Optimizing the Production of Red Pigments with Antioxidant Effect by Using *Perenniporia fraxinea*
Jiwoo KIM, Jungheon LEE
 Department of Chemical Engineering, Chosun University, Gwangju, Korea

- P0523** Antibacterial Activity Domestic Bamboo Wax
Yong-Hyeon JEONG, Da-song KIM, Jegadeesh RAMAN, Eui Jin KIM, Hyun-jae SHIN
Biochemical and polymer engineering, Chosun University, Gwangju, Korea
- P0524** Enhanced Polyhydroxyalkanoate and Astaxanthin Co-production by Cell Retention Culture of *Paracoccus* sp. LL1
Chanin KHOMLAEM, Hajer ALOUI, Beom Soo KIM
Department of Chemical Engineering, Chungbuk National University, Cheongju, Korea
- P0525** Construction of Antigen 43 System for *Escherichia coli*-derived Outer Membrane Particles Displaying Recombinant Antigen
Hyo-won YOON¹, Gna AHN², Yang-Hoon KIM¹, Ji-Young AHN¹
¹Department of Biological Sciences and Biotechnology, Chungbuk National University, Cheongju, Korea,
²Center for Ecology and Environmental Toxicology, Chungbuk National University, Cheongju, Korea
- P0526** Heterologous Expression of *Vibrio* sp. dhg Genes for Enhanced Lycopene Production in *Escherichia coli*
Min Jae KIM¹, Myung Hyun NOH¹, Sunghwa WOO¹, Hyun Gyu LIM¹, Gyoo Yeol JUNG^{1,2}
¹Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea, ²School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea
- P0527** Separation and Purification of Diamines from Fermentation Broth
Jong An LEE^{1,2,3}, Jung Ho AHN^{1,2,3}, Inho KIM¹, Sheng LI¹, Yeah-Ji AHN^{1,2,3}, Sang Yup LEE^{1,2,3,4}
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- P0528** Characterization of Halophilic Bacteria *Halomonas* sp. to Produce Polyhydroxyalkanoates (PHAs)
Youjung KONG¹, Haeng-Geun CHA¹, Hye-ji JIN¹, Yu-Bin JEON¹, Jeong Chan JOO², Yung-Hun YANG³, See-Hyoung PARK¹, Kyungmoon PARK¹
¹Department of Biological and Chemical Engineering, Hongik University, Sejong, Korea, ²Department of Biotechnology, The Catholic University of Korea, Bucheon, Korea, ³Department of Biological Engineering, Konkuk University, Seoul, Korea
- P0529** Degradation of Polybutylene Adipate-co-terephthalate (PBAT) and Polybutylene Succinate (PBS) by *Bacillus pumilus*
Yubin JEON, Haeng-Geun CHA, Youjung KONG, Hyeji JIN, Byeonguk LEE, See-Hyoung PARK, Kyungmoon PARK
Department of Biological and Chemical Engineering, Hongik University, Sejong, Korea

- P0530** Whole Cell Bioconversion for Glutaric Acid Production from High Concentration 5-aminovaleic Acid by Cell Exchange Method Using Recombinant *Escherichia coli*
Haeng-Geun CHA¹, Youjung KONG¹, Hee Taek KIM², Jeong Chan JOO³, Jung-Oh AHN⁴, Yung-Hun YANG⁵, See-Hyung PARK¹, Kyungmoon PARK¹
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- P0531** Optimizing Mass Culture for *Sphingomonas* sp.C8-2 to Degrade Triazole Fungicide Defenoconazole
Jun-Kyung PARK¹, Gui Hwan HAN¹, Ho-Dong LIM¹, Kong-Min KIM¹, Jung-Hwan JI¹, So-Jung RHYU¹, Yeon-Woong CHOI¹, Yul-A CHOI², In-Cheol PARK³, Jae-Hyung AHN³
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- P0532** Potent Thermotolerant *Kluyveromyces marxianus* Isolated from Nuruk
Jeong-Ah YOON¹, Seong-Wook CHO¹, Soo-Hwan YEO², Myoung-Dong KIM^{3,4}
¹Department of Food Biotechnology and Environmental Science, Kangwon National University, Chuncheon, Korea, ²Division of fermented and Processing Food Science, National Institute of Agricultural Science, RDA, Wanju, Korea, ³Department of Food Science and Biotechnology, Kangwon National University, Chuncheon, Korea, ⁴Institute of Fermentation and Brewing, Kangwon National University, Chuncheon, Korea
- P0533** Isolation of Lactic Acid Bacteria with Antibacterial Effect against Poultry Pathogens from Traditional Fermented Food
 Eun-Hye LEE¹, Yeon-Hwa LEE¹, Se-Young KWUN², Jeong-Ah YOON², Soo-Hwan YEO³, Myoung-Dong KIM^{1,4}
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- P0534** Isolation of Potent *Bacillus* Strains Producing Phytase from Nuruk
 Won-Ho LEE¹, Se-Young KWUN², Jeong-Ah YOON², Soo-Hwan YEO³, Myoung-Dong KIM^{1,4}
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- P0535** Characteristics of *Pseudomonas brenneri* Isolated from Korean Raspberry
Kyong-Min SEOK¹, Jeong-Ah YOON², Soo-Hwan YEO³, Myoung-Dong KIM^{1,4}
¹Department of Food Science and Biotechnology, Kangwon National University, Chuncheon, Korea, ²Department of Food Biotechnology and Environmental Science, Kangwon National University, Chuncheon, Korea, ³Division of Fermented and Processing Food Science, National Institute of Agricultural Science, RDA, Wanju, Korea, ⁴Institute of Fermentation and Brewing, Kangwon National University, Chuncheon, Korea
- P0536** Isolation of *Bacillus* Strains Showing Fibrinolytic Activity from Fermented Foods
Jun-Won KIM¹, Jeong-Ah YOON², Soo-Hwan YEO³, Myoung-Dong KIM^{1,4}
¹Department of Food Science and Biotechnology, Kangwon National University, Chuncheon, Korea, ²Department of Food Biotechnology and Environmental Science, Kangwon National University, Chuncheon, Korea, ³Division of fermented and Processing Food Science, National Institute of Agricultural Science, RDA, Wanju, Korea, ⁴Institute of Fermentation and Brewing, Kangwon National University, Chuncheon, Korea
- P0537** Enhancement of Microalgal Biomass Areal Productivity by Using Easy-scale-up Bubble Column Type Transparent Film Bag Photobioreactor
Jeong Seop LEE, Byung Sun YU, Sang Jun SIM
Korea University, Seoul, Korea
- P0538** Enhancement of 2,3-butanediol Production Using Extracted Sugars by *Chlorella pyrenoidosa* and Biodiesel-derived Crude Glycerol from *Klebsiella aerogenes* ATCC 29007
Ju Hun LEE¹, Do Yoon LEE², Hyeong Ryeol KIM¹, Kyung Rae KIM¹, Eun Jeong KIM¹, Chulhwan PARK³, Hah Young YOO⁴, Ho Seok KWAK², Seung Wook KIM¹, Ja Hyun LEE²
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- P0539** Searching for Antibacterial Materials to Extend the Shelf Life of Salted Fish
JiHo YANG¹, HyunJung LEE¹, Hyun Jin JO¹, Jung Hwan OH², Fatih KARADENIZ², Mi-Soon JANG³, Chang-Suk KONG^{1,2}
¹Department of Food and Nutrition, Silla University, Busan, Korea, ²Marine Biotechnology Center for Pharmaceuticals and Foods, Silla University, Busan, Korea, ³Food Safety and processing Research Division, National Institute Fisheries Science, Busan, Korea
- P0540** *In vivo* Conversion of Fatty Acids Methyl Ester in *Synechocystis* sp. PCC 6803 with Insect or Plant FAMTS
Mi-jin KANG, Danbee YOO, Seong-Joo HONG, Choul-Gyun LEE
Department of Biological Engineering Inha University, Korea
- P0541** Ferrous Iron Oxidation by the Immobilized Cells of *Acidithiobacillus ferrooxidans*
Gyeommin KIM¹, Myunghoon MOON², Tae Wan KIM^{1,3}
¹Interdisciplinary Program for Bioenergy & Biomaterials, Chonnam National University, Gwangju, Korea, ²Gwangju Bio/Energy R&D Center, Korea Institute of Energy Research, Gwangju, Korea, ³Department of Biotechnology and Bioengineering, Chonnam National University, Gwangju, Korea

- P0542** Feeding Effects of *Rhodobacter sphaeroides*, *Lactobacillus*, and Alginate Oligosaccharide on Composition of Gut Microbiota in Jeju Black-swine
Nguyen Thi My LE, Seung-Moon PARK
 Department of Agrochemistry, Jeonbuk National University, Jeonju, Korea
- P0543** Optimization of Cultivation Conditions for Eicosapentaenoic Acid (EPA) Production in *Nannochloropsis salina*
Seungjib JEON^{1,2}, Hyun Gi KOH¹, Mi Rae KIM², Young Jin KIM², Hyejeong HEO², Joon-Chul LEE², Yong Keun CHANG¹
¹Advanced Biomass R&D Center, Daejeon, Korea, ²Human Convergence Technology Group, Korea Institute of Industrial Technology (KITECH), Ansan, Korea
- P0544** Polyhydroxyalkanoate (PHA) Production by *Halomonas* sp. Using Wastewater Derived from Food Waste
Jong-Min JEON¹, Ye-seung SON¹, Jeong-Hoon PARK², Yung-Hun YANG^{3,4}, Jeong-Jun YOON¹
¹Green & Sustainable Materials R&D Department, Korea Institute of Industrial Technology (KITECH), Korea, ²Sustainable Technology and Wellness R&D Group, Korea Institute of Industrial Technology (KITECH), Korea, ³Department of Biological Engineering, College of Engineering, Konkuk University, Seoul, Korea, ⁴Institute for Ubiquitous Information Technology and Applications (CBRU), Konkuk University, Seoul, Korea
- P0545** Chitosan Hydrogel Capsule for Enzyme Immobilization
 Amos K. DWAMENA, Chang Sup KIM
 Department of Chemical & Biological Engineering, Hanbat National University, Daejeon, Korea
- P0546** Culture Optimization for Co-expression of Green Florescence Protein and Fusion Peptide in *Escherichia coli*
 George Nkrumah ENNINFUL, Chang Sup KIM
 Department of Chemical & Biological Engineering, Hanbat National University, Daejeon, Korea

바이오화학 및 화장품 생물공학 (Bio-based Chemicals and Cosmetic Bioengineering)

- P0601** Skin-whitening and Anti-wrinkle Effects of Water Extract of Clove (*Syzygium aromaticum*)
Eun Min SHIN¹, Ju Yeon KIM¹, Si Eun PARK¹, Sung Eum OH², Min Sung KIM², Chang-Joon KIM¹
¹Department of Chemical Engineering, Gyeongsang National University, Jinju, Korea, ²Garam of Nature, Gyeongsan, Korea
- P0602** Surfactant-free Palladium Nanoparticles on Protein Particle Scaffold as High Performance Catalysts
Yeonhwa YU¹, Euiyoung JUNG², Taekyung YU², Jeewon LEE¹
¹Department of Chemical and Biological Engineering, College of Engineering, Korea University, Seoul, Korea, ²Department of Chemical Engineering, Kyung Hee University, Yongin, Korea
- P0603** Microfluidic Production of Multicompartmental Core-shell Hydrogel Microspheres toward Programmable Biomolecular Conjugation
Yoon CHOI¹, Eric LIU², Hyunmin YI², Chang-Hyung CHOI¹
¹Division of Cosmetic Science and Technology, Daegu Haany University, Gyeongsan, Korea, ²Department of Chemical and Biological Engineering, Tufts University, Medford, USA
- P0604** Facile Fabrication of Stimuli-responsive Nanoparticles for Peptide Delivery
Donghun SHIN, Seungki LEE, Ji Hyeon OH, Sunho HONG, Jungwoo CHOE, Inhee CHOI
Department of Life Science, University of Seoul, Seoul, Korea
- P0605** The Improvement of Skin Inflammation by Taxifolin in Psoriasis Model Using TNF- α /IL-17A/IFN- γ Induced HaCaT Cells
Jung Eun PARK¹, Hyung Seo HWANG¹, Hwa Jin LEE²
¹School of Cosmetic Science and Beauty Biotechnology, Semyung University, Jecheon, Korea, ²School of Industrial Bio-Pharmaceutical Science, Semyung University, Jecheon, Korea
- P0606** Studies on Anti-inflammatory and Anti-aging activity of Fermented *Ligustrum Fructus*
Su Ryeon CHOI¹, Eun Jin SHIN², Kee-Young LEE², Sang Moon KANG², Mi Kyeong LEE³, Hyung Seo HWANG¹
¹School of Cosmetic Science and Beauty Biotechnology, Semyung University, Jecheon, Korea, ²A&PEP Co. Ltd., Cheongju, Korea, ³College of Pharmacy, Chungbuk National University, Cheongju, Korea
- P0607** New Enzyme Based Whitening Cosmetics
Zhibek SADYKOVA, Seunghyun HAN, Trang Vu Thien NGUYEN, Heeyeon BAEK, Yong Hwan KIM
School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea

- P0608** Approach to Soluble Expression of Recombinant Lignin Peroxidase in *Escherichia coli* by Removing Disulfide Bond
Heeyeon BAEK, Joo Young PARK, Yong Hwan KIM
 Department of Energy and Chemical Engineering, UNIST, Ulsan, Korea
- P0609** Engineering of CO₂ Affinity for MeFDH1 through Channel Redesign Based on RcFDH
Ingeun JO, Yong Hwan KIM, Byoung Wook JEON, Sukmin KIM
 School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea
- P0610** Discovery of Hypothetical Proteins of *Phanerochaete chrysosporium* Secretome as Accessory Proteins of Lignin Peroxidase for Lignin Biodegradation
Seung-hyun HAN, Yong Hwan KIM
 School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea
- P0611** Analysis of Lipid Acids Contents and Antioxidant Activity of Hydrophobic Extracts of *Aurea Helianthus* Flower
Nain KIM, Moon-Hee CHOI, Hyun-Jae SHIN
 Department of Chemical Engineering, Graduate School of Chosun University, Gwangju, Korea
- P0612** Antioxidant Activity and Lipid Contents from Solvent Extracts of Domestic *Cinnamomum yabunikkei* H.Ohba
Seung-Hwa YANG, Eun-Jin LEE, Moon-Hee CHOI, Hyun-Jae SHIN
 Department of Chemical Engineering, Graduate School of Chosun University, Gwangju, Korea
- P0613** A Simple Method to Control Glycolytic Flux for Construction of Optimal Cell Factory
Jae Seong HWANG¹, Seong Gyeong KIM², GyooYeol JUNG^{1,2}
¹School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea, ²Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea
- P0614** Development and Validation of Peptidomimetic Process with Improved Thermal Stability and Enzyme Resistance
Yong-Seung JOUN¹, KwangSoon CHOI¹, YeRin KIM¹, Kee-Young LEE¹, Eunjin SHIN¹, Tae-Heon KIM¹, Hyun KANG², Kimoo LEE³, SangMoon KANG¹
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- P0615** Whitening Effects of GC/MS Components from *Scolopendra subspinipes mutilans* Fractions
JiEun LEE, SungHwa OH, YuSeon NOH, JiHun SEOK, YongJoo KIM, YoungSu JANG
 Nano Bio Research Center, Jeonnam Bioindustry Foundation, Jangseong, Korea

- P0616** Preparation and Characterization of Poly(ϵ -caprolactone) Microcapsules Containing *Scolopendra subspinipes* Extract
JiEun LEE, SungHwa OH, YuSeon NOH, JiHun SEOOK, YongJoo KIM, YoungSu JANG
Nano Bio Research Center, Jeonnam Bioindustry Foundation, Jangseong, Korea
- P0617** Antioxidant, Antibacterial and Antiviral Properties of *Reynoutria japonica* Root Extract
Ha Youn LEE, Gi-Yeon HAN, Joonseok CHA
Research Center, The Garden of Naturalsolution Co. Ltd., Osan, Korea
- P0618** *Hamamelis virginiana* Extract Protects from PM_{2.5}-induced Inflammation via PAR-2 Signaling
Jiyoung CHOI¹, Gi-Yeon HAN¹, Dongki YANG², Joonseok CHA¹
¹Research Center, The Garden of Naturalsolution, Osan, Korea, ²Department of Physiology, College of Medicine, Gachon University, Incheon, Korea
- P0619** Characterization of a Piperonal Synthase in *Piper nigrum*
Moonhyuk KWON¹, Zhehao JIN², Jurathip WUNGSINTAWEEKUL³, Dae-Kyun RO⁴, Seon-Won KIM¹, Soo-un KIM^{5,6}
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- P0620** One-step Production of Butyl Butyrate
Hyeon Ji NOH¹, Ye Rin YOON¹, Ji Eun WOO¹, Haeng Lim LEE¹, Sang Yup LEE², Yu-Sin JANG¹
¹Division of Applied Life Science (BK21), Department of Applied Life Chemistry, Institute of Agriculture & Life Science (IALS), Gyeongsang National University, Jinju, Korea, ²Department of Chemical and Biomolecular Engineering (BK21 Plus Program), BioProcess Engineering Research Center, Institute for the BioCentury, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea
- P0621** Antibacterial Analysis of Extracts from Selected Tropical Plants and Study on Potential Application to Antimicrobial Substance
Seunghee KIM¹, Jeongho LEE¹, Hyerim SON¹, Ji Yeh HONG¹, Min Young JEONG¹, Su Jin CHOI¹, Kang Hyun LEE¹, Rusea GO², Sangho CHOP³, Hah Young YOO¹
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- P0622** Antioxidant Screening of Extracts from Mongolian Plants for Functional Cosmetic Applications
 Jeongho LEE¹, Seunghee KIM¹, Hyerim SON¹, Minkyu SHIN¹, Hoin YU¹, Kang Hyun LEE¹, Badamtssetseg BAZARRAGCHAA², Sangho CHOI³, Hah Young YOO¹
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- P0623** Optimization of Phycocyanin Extraction from Extremophile *Galdieria sulphuraria*
 Jin-Kyu LIM, Won-Kun PARK
 Dept. of chemistry and energy engineering, Sangmyung University, Seoul, Korea
- P0624** Inhibitory Effects of *Cnidium japonicum* Crude Extract on Tyrosinase Activity and Melanin Formation in B16F10 Melanoma Cells
 Hyun Jin JO¹, JiHo YANG¹, HyunJung LEE¹, Jung Hwan OH², Fatih KARADENIZ², Youngwan SEO³, Chang-Suk KONG^{1,2}
¹Department of Food and Nutrition, Silla University, Busan, Korea, ²Marine Biotechnology Center for Pharmaceuticals and Foods, Silla University, Busan, Korea, ³Division of Marine Bioscience, Korea Maritime and Ocean University, Busan, Korea
- P0625** Inhibitory Effects of *Cnidium japonicum* Solvent Fractions on Tyrosinase Activity and Melanin Formation in B16F10 Melanoma Cells
 Hyun Jin JO¹, JiHo YANG¹, HyunJung LEE¹, Jung Hwan OH², Fatih KARADENIZ², Youngwan SEO³, Chang-Suk KONG^{1,2}
¹Department of Food and Nutrition, Silla University, Busan, Korea, ²Marine Biotechnology Center for Pharmaceuticals and Foods, Silla University, Busan, Korea, ³Division of Marine Bioscience, Korea Maritime and Ocean University, Busan, Korea
- P0626** Santamarine Protects Keratinocytes against Ultraviolet B-induced Photoaging via Suppression of MAPK/AP-1 Activation
 Jung Hwan OH¹, Fatih KARADENIZ¹, Junse KIM², Hye Ran KIM³, JiHo YANG³, HyunJung LEE³, Hyun Jin JO³, Chang-Suk KONG^{1,3}, Youngwan SEO²
¹Marine Biotechnology Center for Pharmaceuticals and Foods, Silla University, Busan, Korea, ²Division of Marine Bioscience, Korea Maritime and Ocean University, Busan, Korea, ³Department of Food and Nutrition, Silla University, Busan, Korea
- P0627** Inhibitory Effect of *Artemisia scoparia* Extract on the UV-induced MMP Expression in Human Dermal Fibroblasts
 HyunJung LEE¹, JiHo YANG¹, Hyun Jin JO¹, Jung Hwan OH², Fatih KARADENIZ², Youngwan SEO³, Chang-Suk KONG^{1,2}
¹Department of Food and Nutrition, Silla University, Busan, Korea, ²Marine Biotechnology Center for Pharmaceuticals and Foods, Silla University, Busan, Korea, ³Division of Marine Bioscience, Korea Maritime and Ocean University, Busan, Korea

- P0628** Effects of *Artemisia scoparia* on Melanin Synthesis in B16F10 Melanoma Cells
JiHo YANG¹, HyunJung LEE¹, Hyun Jin JO¹, Jung Hwan OH², Fatih KARADENIZ²,
Youngwan SEO³, Chang-Suk KONG^{1,2}
¹Department of Food and Nutrition, Silla University, Busan, Korea, ²Marine Biotechnology Center for
Pharmaceuticals and Foods, Silla University, Busan, Korea, ³Division of Marine Bioscience, Korea
Maritime and Ocean University, Busan, Korea
- P0629** Recombinant Lignin Peroxidases (*PcLiPs*) Expression in *Pichia pastoris*:
Transcriptional Analysis of Copy Genes by Real Time PCR
Vikky RAJULAPATI, Seung-hyun HAN, Yong Hwan KIM
Enzyme and Protein Engineering Lab, School of Energy and Chemical Engineering, Ulsan National
Institute of Science and Technology, Ulsan, Korea
- P0630** Boosting CO Conversion of CO Dehydrogenase with the Fine-tuned Interaction for
Artificial Mediators
Suk Min KIM, Seung Hyuk KANG, Jinhee LEE, Yong Hwan KIM
School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology
(UNIST), Ulsan, Korea
- P0631** CO Utilization of High-efficient CO Dehydrogenase in Real Flue Gas
Suk Min KIM, Jinhee LEE, Seung Hyuk KANG, Yong Hwan KIM
Department of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology
(UNIST), Ulsan, Korea
- P0632** Methanotrophic Polyhydroxybutyrate (PHB) Production with *Methylocystis hirsuta*
Hyebeen BYUN, Hyunjin KIM, Okkyoung CHOI, Byoung-In SANG
Department of Chemical Engineering, Hanyang University, Seoul, Korea

의공학 및 바이오제약공학 (Biomedical and Biopharmaceutical Engineering)

- P0701** Combination Therapy for Treatment with IRE and STING Agonist
GaHyun BAE, Wooram PARK
 Department of Biomedical-Chemical Engineering, The Catholic University of Korea, Bucheon, Korea
- P0702** Development of Targeted Delivery System of Monomethyl Auristatin E Using Recombinant Fusion Protein
Sugyoeng KIM¹, Su Yeon LIM¹, Hongbin KIM¹, Kwang Suk LIM^{1,2}
¹Interdisciplinary Program in Biohealth-machinery convergence engineering, College of ACE, Kangwon National University, Chuncheon, Korea, ²Department of Biotechnology and Bioengineering, College of ACE, Kangwon National University, Chuncheon, Korea
- P0703** Development of Antioxidative Fusion Protein with Zn/DNA Nanocluster Complex Treatment for Oxidative Stress Disease Prevention and Treatment
Hongbin KIM¹, Su Yeon LIM¹, Chang Yeop KEUM¹, Kwang Suk LIM^{1,2}
¹Interdisciplinary Program in Biohealth-machinery convergence engineering, College of ACE, Kangwon National University, Chuncheon, Korea, ²Department of Biotechnology and Bioengineering, College of ACE, Kangwon National University, Chuncheon, Korea
- P0704** The Correlation Between Adult Obesity and Lifestyle: Result of the 8th Korean National Health and Nutrition Examination Survey (KNHANES, 2019)
Mi Song NAM^{1,2}, JongSu PARK³, Yeongeun SON³, Sohui PARK³, Su-Ah PARK¹, Youngtae RYU³, Min Kyung KIM³, Jumyung UM³, Yun Jung HEO^{1,2}
¹Department of Mechanical Engineering, Kyung Hee University, Yongin, Korea, ²Integrated Education Institute for Frontier Science & Technology (BK21 Four), Kyung Hee University, Yongin, Korea, ³Department of Industrial & Management Systems Engineering, Kyung Hee University, Yongin, Korea
- P0705** Colostrum Derived-exosomes Alleviate Inflammatory Symptoms in Experimental Colitis via Immunosuppressive Effects
Haeun CHO^{1,2}, Geonhee HAN^{1,3}, Kwang Yeon HWANG², Sun Hwa KIM¹, Yooso YANG¹
¹Center for Theragnosis, Biomedical Research Institute, Korea Institute of Science and Technology (KIST), Seoul, Korea, ²Department of Biotechnology, College of Life Sciences & Biotechnology, Korea University, Seoul, Korea, ³KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, Korea
- P0706** The Role of Nanospheres Loaded with Melatonin in the Improving of the Migration and Recovery Process of Inflammatory Bowel Disease
Do-Wan KIM, Sei-Jung LEE
 Department of Pharmaceutical Engineering, Daegu Haany University, Gyeongsan, Korea
- P0707** Protective Effects of *Grifola frondosa* Extract Containing Naringin, Hesperidin, Chlorogenic Acid, and Kaempferol on Bisphenol A-induced Apoptotic Cell Death in Normal Human Dermal Fibroblasts
Seong-Ryeong LIM, Ju-Ha KIM, Sei LEE
 Department of Pharmaceutical Engineering, Daegu Haany University, Gyeongsan, Korea

- P0708** Effect of Food Sensitivity on Overweight Was Assessed Using Food-specific Serum IgG Levels
Minhyeong LEE¹, Soyoun KIM¹, Hyeonmin GIL², Eugene CHEON², Nana KEUM², Youngeun KWON¹
¹Department of Biomedical Engineering, Dongguk University, Seoul, Korea, ²Department of Food Science and Biotechnology, Dongguk University, Seoul, Korea
- P0709** Triple Cross-linked Poly (vinyl alcohol)/Methacrylate Kappa-carrageenan/ Chitooligosaccharide Hydrogel for Full Thickness Wound Healing
Pathum CHANDIKA¹, Min-Sung KIM¹, Fazlurrahman KHAN², Young-Mog KIM^{2,3,4}, Won-Kyo JUNG^{1,3,4}
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- P0710** Evaluation of Decellularized Oliver Flounder Skin as Wound Healing Application
Seong-Yeong HEO^{1,2}, Se-Chang KIM^{2,3}, Won-Kyo JUNG^{1,2,3}
¹Marine-Integrated Bionics Technology, Pukyong National University, Busan, Korea, ²Marine Integrated Biomedical Technology Center, The National Key Research Institutes in Universities, Pukyong National University, Busan, Korea, ³Department of Biomedical Engineering, and New-senior Healthcare Innovation Center (BK21 Plus) Pukyong National University, Busan, Korea
- P0711** Connecting Two 30Kc19 α Monomers Using a Flexible Linker for Efficient Dimer Formation and Cell-penetration
Haein LEE¹, Hyeong Seok LEE², Seong-Hoon KIM², Soo Hee RYU², Tai Hyun PARK¹
¹School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, Korea, ²UPPTHERA R&D center, UPPTHERA Inc., Incheon, Korea
- P0712** Detection of Prostate Cancer Biomarker in the Urine Sample by Using Olfactory Receptor-embedded Detergent Micelles
Soo Hyun JEONG¹, Kyo Chul KOO², Tai Hyun PARK^{1,3}
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- P0713** T Cell-derived Nanovesicles for Cancer Immunotherapy
Jihye HONG¹, Byung-Soo KIM^{1,2}
¹Interdisciplinary program for Bioengineering, Seoul National University, Seoul, Korea, ²School of Chemical and Bioengineering, Seoul National University, Seoul, Korea
- P0714** A Novel Pretraining Method for Language Model to Enhance Accuracy in Biomedical Information Extraction
Seong-Min KIM, Hyun Hak KIM, Joongyeon CHOI, Hyunggun KIM
Department of Biomechatronic Engineering, Sungkyunkwan University, Suwon, Korea

- P0715** Development of a Loop-mediated Isothermal Amplification (LAMP) Assay for Diagnosing *Candida auris*
Dong June YANG¹, Kyu-Sung LEE², Min ji YANG³, Jeonghun NAM³, Da Hye LIM⁴, Chae Seung LIM⁴, Woong Sik JANG⁵
¹Dept. of Medical Device Management and Research, SAIHST, Sungkyunkwan University, Seoul, Korea, ²Dept. of Urology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea, ³Dept. of Song-Do Bio-Environmental Engineering, Incheon Jaeneung Univ., Incheon, Korea, ⁴Dept. of Laboratory Medicine, College of Medicine, Korea Univ. Guro Hospital, Seoul, Korea, ⁵Emergency Medicine, College of Medicine, Korea Univ. Guro Hospital, Seoul, Korea
- P0716** Inhibition of Metastatic Melanoma through Nano-micelle Generating Degradable Microneedles Including Chemotherapy Drug
SuYeon LIM, Dahwun KIM, SiYan LYU, OwiBo HWANG, ByungDeok KIM, ChaeEun PARK, Ji hoon JEONG
 School of Pharmacy, Sungkyunkwan University, Suwon, Korea
- P0717** Development of DMSO-free Cryopreservation Media for Cells Producing Biopharmaceuticals
Beom Jin KIM, Do Hee LEE, Duk Jae OH
 Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea
- P0718** Detection of Cancer-derived Exosome Using Aptamer-PDA Liposomes
Min Hyeong SON¹, Yun Kyung JUNG^{1,2}
¹Department of Nanoscience and Engineering, Inje University, Gimhae, Korea, ²School of Biomedical Engineering, Inje University, Gimhae, Korea
- P0719** Chemo-photothermal Effect of Calcium Phosphate Nanoparticles for pH-responsive Delivery of Doxorubicin and Tumor Targeting Peptide
Eunsu KIM, Hoomin LEE, Kwanwoo KIM, Suheon KIM, Yun Suk HUH
 Department of Biological Sciences and Bioengineering, Nano Bio High-Tech Materials Research Center, Inha University, Incheon, Korea
- P0720** Strategies for *ex vivo* Expansion and Cytotoxicity Enhancement of NK Cells Using Mechanical Stimuli
Myeongkwon SONG^{1,2}, Soonjo KWON^{1,2}
¹Department of biological Engineering, Inha University, Incheon, Korea, ²Department of Biological Sciences and Bioengineering, Inha University, Incheon, Korea
- P0721** Development of Dual-functional Aptamer Complex that Inhibit the Pancreatic Cancer Growth
Woo-Ri SHIN, Hee-Young CHO, Ji-Young AHN, Yang-Hoon KIM
 Major in Microbiology School of Biological Sciences College of Natural Sciences, Chungbuk National University, Cheongju, Korea

P0722 Aptamer Optimization through DBP-vitamin D Complex Aptamer Binding Prediction
Jin-Pyo LEE¹, Woo-Ri SHIN¹, Simranjeet Singh SEKHON¹, Sang Yong KIM², Ji-Hyang WEE², Ji-Young AHN¹, Yang-Hoon KIM¹

¹Major in Microbiology School of Biological Sciences College of Natural Sciences, Chungbuk National University, Cheongju, Korea, ²Department of Food Science and Biotechnology, Shin Ansan University, Ansan, Korea

P0723 Development of Cellulose Nanocrystal Gene Delivery System with Nano-self-assembly Zinc/DNA Nanocluster

Kyoungcheol CHOI¹, Hongbin KIM¹, Chan Hee LEE¹, Kwang Suk LIM^{1,2}

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P0724 LMO2-LDB1 Transcriptional Mediator Activates STAT3 Signaling via GP130-dimerization in Glioblastoma Stem Cells

Sung Jin KIM^{1,2}, Cheol Gyu PARK^{1,2}, Sang-Hun CHOI^{1,2}, Seon Yong LEE^{1,2}, Kiyoung EUN^{1,2}, Min Gi PARK^{1,2}, Junseok JANG^{1,2}, Hyunggee KIM^{1,2}

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P0725 Efficient Tumour Rejection by NIH3T3-CM-educated CTLs Transferred via Intravenous or Intraperitoneal Injection

Heesu KIM, Jinsoo OH, Seho PARK

Department of Life Sciences, Korea University, Seoul, Korea

P0726 Neuromedin U Contributes to Radiation Resistance in Colorectal Cancer via Activating YAP/TAZ Signaling

Myeong-Kyu SIM^{1,2}, Ki-Seok NAM¹, Kwang Seok KIM¹, Hyunggee KIM²

¹Division of Radiation Biomedical Research, Korea Institute of Radiological and Medical Sciences, Seoul, Korea, ²Department of Biotechnology, School of Life Sciences and Biotechnology, Korea University, Seoul, Korea

P0727 Retraction Fiber of Migrating Glioblastoma Cells Serve a Trail for Cell Migration

Kanghun LEE^{1,2}, Seon Yong LEE^{1,2}, Sang-Hun CHOI^{1,2}, Min Seok LEE³, Amanzhol KURMASHEV³, Hae Nim LEE⁴, Young-Gyu KO⁵, Jihye SEONG⁴, Joo H. KANG³, Hyunggee KIM^{1,2}

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P0728 The Role of Bone Marrow Stromal Cell Antigen 2 (BST2) in the Development of Collagen-induced Arthritis (CIA)

Jae-Myeong JEON, Jin-Soo OH, Se-Hoon PARK, ZHENGMEI XU, Se-Ho PARK

Department of Life Sciences, Korea University, Seoul, Korea

- P0729** DRP5 Controls Properties of Glioma Stem Cells as a Biomarker of Proneural Subtype Glioma Stem Cell
So Hee JEONG^{1,2}, Min Gi PARK^{1,2}, Sunyoung SEO^{1,2}, Seok Won HAM^{1,2}, Hyunggee KIM^{1,2}
¹Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, Korea, ²Institute of Animal Molecular Biotechnology, Korea University, Seoul, Korea
- P0730** JAG1 Intracellular Domain JICD1 Forms Novel Transcription Complex with DDX17, SMAD3, TGIF2 without Contact Notch Receptor
Hyeon Ju JEONG^{1,2}, Eun-Jung KIM^{1,2}, Jung Yun KIM^{1,2}, Seok Won HAM^{1,2}, Sang-Hun CHOI^{1,2}, Nayoung HONG^{1,2}, Min Gi PARK^{1,2}, Junseok JANG^{1,2}, Sunyoung SEO^{1,2}, Sung-Ok KIM³, Sung-Chan KIM³, Hyunggee KIM^{1,2}
¹Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, Korea, ²Institute of Animal Molecular Biotechnology, Korea University, Seoul, Korea, ³Department of Biochemistry, College of Medicine, Hallym University, Chuncheon, Korea
- P0731** Enhanced Site Specific Conjugation Yield of Human Serum Albumin to GLP-1 via Faster Click Chemistry Reaction
Giseok MOON
 Department of Material Science and Engineering, GIST, Gwangju, Korea
- P0732** Antioxidant and Anticancer Activities of Methanolic Extracts from Indigenous Freshwater Green Microalgae
Z-Hun KIM, Kyung June YIM
 Microbial Research Department, Nakdonggang National Institute of Biological Resources, Sangju, Korea
- P0733** Application of Recombinant Arginine Deiminase-30Kc19 α for Effective Treatment of Melanoma
Geunhwa PARK¹, Haein LEE², Tai Hyun PARK^{1,2}
¹Interdisciplinary Program in Bioengineering, Seoul National University, Seoul, Korea, ²School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, Korea
- P0734** Sustained Release Microspheres of Anti-VEGF Drugs for the Treatment of Subfoveal Choroidal Neovascularization
Siyun LYU, Su Yeon LIM, Byung Deok KIM, Da Whun KIM, Chae Eun PARK, Oui Bo WHANG, Ji Hoon JEONG
 School of Pharmacy, Sungkyunkwan University, Suwon, Korea
- P0735** MCF-7 Derived Exosome as Anticancer Drug Delivery Platform into Breast Cancer
Hyeonseok KIM, Mi-Kyeong JANG
 Department of Chemical Engineering, College of Engineering, Suncheon National University, Suncheon, Korea
- P0736** Novel Phytochemical Molecules Targeting Estrogen Receptor-overexpressing Cancer Cells
Seong-Cheol PARK, Mi-Kyeong JANG
 Department of Chemical Engineering, College of Engineering, Suncheon National University, Suncheon, Korea

- P0737** Enhanced Apoptotic Effects via Dual Delivery of Gene and Peptide to Breast Cancer
Seong-Cheol PARK, Mi-Kyeong JANG
Department of Chemical Engineering, College of Engineering, Suncheon National University, Suncheon, Korea
- P0738** Specific Targeting Gene Delivery to Cancer Cells Overexpressing Transferrin Receptor
Seong-Cheol PARK, Mi-kyeong JANG
Department of Chemical Engineering, College of Engineering, Suncheon National University, Suncheon, Korea
- P0739** Optimization of mRNA Transfection Conditions with Polymeric Nanoparticles on Human Natural Killer Cells
Ha Yeon PARK¹, Sehwan JEONG², Myeongkwan SONG¹, Kyobum KIM², Hyun Jin KIM¹
¹Department of Biological Engineering, Inha University, Incheon, Korea, ²Department of Chemical & Biochemical Engineering, Dongguk University, Seoul, Korea
- P0740** Attenuation of Obesity with Synergistic Therapeutic and Preventive Effects of Natural Products by Suppression of Associated Promoting Signaling Pathways
Muhammad Imran KHAN¹, Muhammad Zubair KHAN¹, Jin Hyuk SHIN¹, Ye Won SHIM¹, Ji Hyeon LEE¹, Tia Sun SHIN^{2,3}, Min Yong KIM^{3,4}, Jong Deog KIM^{1,3}
¹Department of Biotechnology, Chonnam National University, Yeosu, Korea, ²Department of Food Science and Nutrition, Chonnam National University, Gwangju, Korea, ³Research center on Anti-Obesity and Health Care, Chonnam National University, Yeosu, Korea, ⁴Department of Refrigeration Engineering, Chonnam National University, Yeosu, Korea
- P0741** A Comprehensive *in vivo* and *in vitro* Investigation of Antibacterial Effects of Green Tea Seed Isolated Saponins Against Pathogenic Bacteria
Muhammad Imran KHAN¹, Muhammad Zubair KHAN¹, Jin Hyuk SHIN¹, Ye Won SHIM¹, Seong Whan CHO¹, Tia Sun SHIN^{2,3}, Min Yong KIM^{3,4}, Jong Deog KIM^{1,3}
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- P0742** Amelioration of Tauopathy via Suppression of Tau Hyperphosphorylation by Reducing the Expression Level of Various Involved Genes and Kinesis with Theasaponin E1, A Therapeutic Target for Alzheimer's Treatment
Muhammad Imran KHAN¹, Muhammad Zubair KHAN¹, Jin Hyuk SHIN¹, Ji Hyeon LEE¹, Seong Whan CHO¹, Tia Sun SHIN^{2,3}, Min Yong KIM^{3,4}, Jong Deog KIM^{1,3}
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- P0743** Effects of Triterpenoid Saponin on the Serotonin Type 3A Receptor
Junho LEE
Department of Biotechnology, Chonnam National University, Gwangju, Korea
- P0744** Carbapenem-resistant Gram-negative Bacteria in Community Wastewater
Jae-Young OH, Hyun-Sun KIM, Lee-Sang HYEON, Jong-Chan CHAE
Division of Biotechnology, Jeonbuk National University, Iksan, Korea
- P0745** Selection and Docking-simulation of Single-stranded DNA Aptamers for Specific Parathyroid Hormone
In-Hwan OH¹, Woo-Ri SHIN¹, Simranjeet Singh SEKHON¹, Sang Yong KIM², Ji-Hyang WEE², Ji-Young AHN¹, Yang-Hoon KIM¹
¹Major in Microbiology School of Biological Sciences College of Natural Sciences, Chungbuk National University, Cheongju, Korea, ²Department of Food Science and Biotechnology, Shin Ansan University, Ansan, Korea
- P0746** [Review] Nature-inspired Conductive Hydrogels for Biophysical Environment
Hyun Tack WOO, Hyung Joon CHA
Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea
- P0747** Introduction of Bioinformatics System for Massive Genomic Data Analysis
Byungwook LEE
Korea Bioinformation Center (KOBIC), KRIBB, Daejeon, Korea

조직공학 및 생체재료공학 (Tissue Engineering and Biomaterial Engineering)

P0801 Microfluidic Device for Analysis of Lymphatic Breast Cancer Metastasis by Interleukin 6

Siyeon PARK¹, Hyeon-Yeol CHO², Jin-Ha CHOI³, Jeong-Woo CHOI¹

¹Department of Chemical and Biomolecular Engineering, Sogang University, Seoul, Korea, ²Department of Bio and Fermentation Convergence Technology, Kookmin University, Seoul, Korea, ³Department of Chemical Engineering, Jeonbuk University, Jeonju, Korea

P0802 The Senolytic Drug JQ1 Removes Senescent Cells via Ferroptosis

Seokhyeong GO¹, Mikyung KANG¹, Sung Pil KWON¹, Mungyo JUNG¹, Ok Hee JEON², Byung-Soo KIM¹

¹School of Chemical and Biological Engineering, Seoul National University, Seoul, Korea, ²BK21 Graduate Program, Department of Biomedical Sciences, Korea University of College of Medicine, Seoul, Korea

P0803 Local and Sustained Delivery of Senolytic Drug Inhibits Disc Degeneration and Restores Disc Structure

Songhyun LIM¹, Seongbae AN², Inbo HAN², Byung-Soo KIM¹

¹School of Chemical and Biological Engineering, Seoul National University, Seoul, Korea, ²Department of Neurosurgery, CHA University School of medicine, CHA Bundang Medical Center, Seongnam, Korea

P0804 Induction of Osteogenic Differentiation of Human Mesenchymal Stem Cells by Using Hyaluronic Acid/Calcium Phosphate Hybrid-based Gene Delivery System

Dahwun KIM, Su Yeon LIM, Siyan LYU, Oui Bo WHANG, Chae Eun PARK, Byung Deok KIM, Ji Hoon JEONG

Department of Pharmacy, Sungkyunkwan University, Suwon, Korea

P0805 Design of Polymeric Gene Carrier for Increased Gene Transfection Efficiency that Shows Reduction of Polyplex-mediated Cellular Oxidative Stress

Hoon Jeong JI, Min Sang LEE, Su Yeon LIM, Dahwun KIM, SiYan LYU, Oui bo WHANG, Chaeun PARK, Byung Deok KIM

School of Pharmacy, Sungkyunkwan University, Suwon, Korea

P0806 Enhanced Systemic siRNA Delivery Using Reducible Bile Acid-modified PEI for Cancer Therapy

Chae eun PARK, Su yeon LIM, Da hwun KIM, Siyan LYU, Byung deok KIM, Oui bo WHANG, Ji hoon JEONG

Department of Pharmacy, Sungkyunkwan university, Suwon, Korea

P0807 Engineered Chondroitin Sulfate Hydrogel for Cartilage Tissue Engineering

Jisoo SHIN¹, Eun-Hye KANG², Soojeong CHOI¹, Donyoung KANG³, Hyungsuk LEE³, In Sik YUN⁴, Seung-Woo CHO¹

¹Department of Biotechnology, Yonsei University, Seoul, Korea, ²Department of Plastic and Reconstructive Surgery, Institute for Human Tissue Restoration, Yonsei University Health System, Severance Hospital, Seoul, Korea, ³School of Mechanical Engineering, Yonsei University, Seoul, Korea, ⁴Department of Plastic and Reconstructive Surgery, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea

- P0808** Mechanically Enhanced Hyaluronic Acid Hydrogel Patch for Effective Bone Regeneration
Soojeong CHOI, Jong Seung LEE, Jisoo SHIN, Seung-Woo CHO
 Department of Biotechnology, Yonsei University, Seoul, Korea
- P0809** Immunomodulatory Extracellular Matrix for Macrophage Polarization and Tissue Regeneration
Yi Sun CHOI¹, Eunseon JEONG¹, Jung Seung LEE¹, Su Kyeom KIM¹, Sung-Hyun JO², Yun-Gon KIM², Hak-Joon SUNG³, Yoonhee JIN¹, Seung-Woo CHO¹
¹Department of Biotechnology, Yonsei University, Seoul, Korea, ²Department of Chemical Engineering, Soongsil University, Seoul, Korea, ³Department of Medical Engineering, Yonsei University College of Medicine, Wonju, Korea
- P0810** Pre-activation of HIF-1 α Using PHD Inhibitor Reduces Cisplatin-induced Nephrotoxicity
Bomin KIM^{1,2}, Soonjo KWON^{1,2}
¹Department of biological Engineering, Inha University, Incheon, Korea, ²Department of Biological Sciences and Bioengineering, Incheon, Korea
- P0811** Effects of Electrical Stimulation on Enhancing the Cytotoxic Activity and Half-life of Natural Killer Cells
Minseon LEE^{1,2}, Soonjo KWON^{1,2}
¹Department of Biological Engineering, Inha University, Incheon, Korea, ²Department of Biological Sciences and Bioengineering, Incheon, Korea
- P0812** Fabrication of 3D Electrospun Nanofiber for Highly Porous Scaffolds
Jin Haeng JO^{1,2}, Ha Neui CHOI^{1,2}, Yun Jung YANG^{1,2}
¹Department of Biological Engineering, Inha University, Incheon, Korea, ²Department of Biological Sciences and Bioengineering, Inha University, Incheon, Korea
- P0813** Bacterial Cellulose-based Photo-curable 3D Printable Bioink for Biomedical Application
SeonHyung LEE, Yang-Hoon KIM, Ji-Young AHN
 Department of Microbiology, Chungbuk National University, Cheongju, Korea
- P0814** Catechol-thiol-based Protein Glue Inspired by Underwater Mussel Redox Chemistry for Dental Resin Formulation
Surim YOO¹, Dohoon LEE², Dong Soo HWANG^{1,2}
¹Division of Integrative Biosciences and Biotechnology, Pohang University of Science and Technology (POSTECH), Pohang, Korea, ²Division of Environmental Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea
- P0815** Bio-inspired Protein & Polymer Networked Mechanically Reinforced Adhesive Microneedle Platform for Improved Transdermal Drug Delivery
Hyeok Jun LEE, Seong-Woo MAENG, Hyung Joon CHA
 Department of Chemical Engineering, Pohang University of Science and Technology, Pohang, Korea

- P0816** Pairing of Orthogonal Chaperones with a Cytochrome P450 Enhances Terpene Synthesis in *Saccharomyces cerevisiae*
Soo Young MOON¹, So-Hee SON^{2,3}, Yeong-seon JANG², Seung Soo OH^{1,3}, Ju Young LEE²
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- P0817** Microsphere Containing Biodegradable Polymer and Modified Magnesium Hydroxide Particles for Acid Neutralization-mediated Anti-inflammation
Jieun HAN^{1,2}, Wooram PARK^{1,2}
¹Department of Biomedical-Chemical Engineering, The Catholic University of Korea, Bucheon, Korea, ²Department of Biotechnology, The Catholic University of Korea, Bucheon, Korea
- P0818** Fabrication of Controllable Cellulose-based Films by Using Ionic Liquid
Saerom PARK, Jeong Woo LEE, Nuri HAN, Jiwoo HAN, Sang Hyun LEE
Department of Biological Engineering, Konkuk University, Seoul, Korea
- P0819** Mining of Laticifer Specific Promoter in Lettuce
Moonhyuk KWON¹, Elysabeth K BARNES², Connor HODGINS², Edward YEUNG², Yang QU³, Seon-Won KIM¹, Dae-Kyun RO²
¹Division of Applied Life Science (BK21 Four), ABC-RLRC, PMBBRC, Gyeongsang National University, Jinju, Korea, ²Department of Biological Sciences, University of Calgary, Calgary, Canada, ³Department of Chemistry, University of New Brunswick Fredericton, Fredericton, Canada
- P0820** Treatment of Cancer with Dissolving Microneedles Array Using Immunomodulators and Antigens
Qui Bo WHANG, Su Yeon LIM, Da Whun KIM, Siyan LYN, Byung Deok KIM, Chae Eun PARK, Ji Hoon JEONG
School of Pharmacy, Sungkyunkwan University, Suwon, Korea
- P0821** Fabrication and Characterization of Levan-based Coaxial Electrospun Nanofibers
Jae Kyeong LEE, Young Hoon SONG, Jeong Hyun SEO
School of Chemical Engineering, Yeungnam University, Gyeongsan, Korea
- P0822** Effects of Triterpenes on 5-hydroxytryptamine 3A Receptor Channel Activity
Junho LEE
Department of Biotechnology, Chonnam National University, Gwangju, Korea
- P0823** Properties of Hydrogel Composites for the Inkjet-printed *in vitro* Alveolar Model
Yunji LEE¹, Jae Eun PARK², Young In SHIN², Na Young KIM², U Hyeon KIM³, Sungjune JUNG^{1,3}
¹Department of Materials Science and Engineering, POSTECH, Pohang, Korea, ²College of Medicine, Yeungnam University, Gyeongsan, Korea, ³Department of Mechanical Engineering, POSTECH, Pohang, Korea

항체공학 및 세포배양공학 (Antibody Engineering and Cell Culture Engineering)

- P0901** UTR (Untranslated Region) Optimization to Improve Recombinant Interferon- β 1a Productivity in CHO Cells under Mild Hypothermia
Jieun KIM, Yuntae HWANG, Duk Jae OH
 Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea
- P0902** Evaluation of Biological Performance in a Newly Developed Single-use Bioreactor, the CELBIC System
Hyunwoo KIM¹, Rock Ki KIM², Young Hee SHIN², Yeong Ok BAIK², Sun Young KIM³, Chong Myong KIM³, Yong Bok LEE³, Kyung Nam KIM³, Duk Jae OH¹
¹Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea, ²Eubiologics CO., Ltd., Chuncheon, Korea, ³Department of Bioprocess, MicroDigital Co., Ltd., Seongnam, Korea
- P0903** Development and Evaluation of a 50mL Scale Single-use Multi-bioreactor System with Control Functions for Dissolved Oxygen, pH, and Temperature
Yun Ju NA¹, Seunghyun WANG¹, Beomseok PARK¹, Donghoon KIM², Doohyun KIM³, Duk Jae OH¹
¹Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea, ²SPL Life Sciences Co., Ltd, Pocheon, Korea, ³E-cell Co., Ltd, Anyang, Korea
- P0904** Fluidized Bed Culture System Using Microcarriers for Adherent Cells
Seohyun PARK, Jinwoo LEE, Duk Jae OH
 Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea
- P0905** Directed Evolution of AAV Vectors for Efficient Gene Delivery to Primary Retinal Cells
Seohee KIM, Yoojin KIM, Jae-Hyung JANG
 Department of Chemical and Biomolecular Engineering, Yonsei University, Seoul, Korea
- P0906** Capsid Engineering for Astrocyte Targeting AAV: Rational Design
Songyeon KIM, Seokmin OH, Jae-Hyung JANG
 Department of Chemical and Biomolecular Engineering, Yonsei University, Seoul, Korea
- P0907** 2pACA and NAD⁺ Enhance Cell Growth and Productivity of Antibody-producing CHO Cells
Ji Hwan LEE, Jong Uk PARK, Hye-Jin HAN, Dae Hoon KIM, Jong Youn BAIK
 Department of Biological Sciences and Bioengineering, Inha University, Incheon, Korea
- P0908** Suspension BHK-21 Cell Line Development for Production of Foot-and-mouth Disease Antigen in Large-scale Bioreactor
Ji Yul KIM¹, Soonyong PARK¹, Ah-Young KIM², Young-Joon KO², Eun Gyo LEE¹
¹Biotechnology Process Engineering Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Cheongju, Korea, ²Center for FMD Vaccine Research, Animal and Plant Quarantine Agency, Gimcheon, Korea

- P0909** Development of Gut-mucus Chip Mimicking Intestinal Mucosa for Intestinal Absorption Study
Seung Yeon LEE, Seo Jin PARK, Ui Jung HWANG, Byoung Ho KO, Da Yun HA, Hwan Hee JANG, Bum Sang KIM, Jong Hwan SUNG
Department of Chemical Engineering, Hongik University, Seoul, Korea
- P0910** Scale-up Study of the Non-structural Protein Removal Method Using Chloroform for Foot-and-mouth Disease Vaccine Production
Eun-Sol KIM, Sun Young PARK, Ah-Young KIM, Sang Hyun PARK, Jong-Hyeon PARK, Young-Joon KO
Center for FMD Vaccine Research, Animal and Plant Quarantine Agency, Gimcheon, Korea
- P0911** Pilot-scale Production of Foot-and-mouth Disease Vaccine Antigen and Its Protective Efficacy in Pig
Jae Young KIM, Sang Hyun PARK, Seo-Yong LEE, Ah-Young KIM, Sun Young PARK, Su-Mi KIM, Jong-Hyeon PARK, Young-Joon KO
Center for FMD Vaccine Research, Animal and Plant Quarantine Agency, Gimcheon, Korea
- P0912** Isolation of SARS-CoV-2 Neutralizing Antibodies from a Human Synthetic Library
Yu Jung KIM, Kyoungjin SONG, Joo Eon LEE, So Ra PARK
Division of Discovery & Optimization, New Drug Development Center, Osong Medical Innovation Foundation, Cheongju, Korea
- P0913** High-throughput Cell Culture Platform
Hye-Young LEE^{1,2}, Wonmo KANG¹
¹Cell line & Media Development Team, Division of Drug Process Development, New Drug Development Center, Osong Medical Innovation Foundation, Cheongju, Korea, ²College of Pharmacy, Chungbuk National University, Cheongju, Korea
- P0914** Improvement of Human Transforming Growth Factor- β 1 Expression in Chinese Hamster Ovary Cells by Post-transcriptional Regulation Element
Yong Jin KIM, Seungjib JEON, Na Young HONG, Hyejeong HEO, Sang Yeop LEE, Mi Rae KIM, Joon-Chul LEE
Human Convergence Technology Group, Korea Institute of Industrial Technology (KITECH), Ansan, Korea
- P0915** Improving Culture Performance and Antibody Titer in CHO Cell Fed-batch Culture by Controlling pH
Sang Yeop LEE^{1,2}, Seungjib JEON², Mi Rae KIM², Hyejeong HEO², Byung Cheon LEE¹, Joon-Chul LEE²
¹Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, Korea, ²Human Convergence Technology Group, Korea Institute of Industrial Technology (KITECH), Ansan, Korea

- P0916** Effects of Maternal Thermal Stress on the Number of Retrieved Oocytes by Ovum Pick Up and Subsequent Embryo Development in Dairy Cattle
Jihwan LEE, Kyungsuk LEE, Doosan KIM, Junkyu SON, Jian LEE, Jinju KIM, Gulwon JANG, Manhye HAN
 Dairy Science Division, National Institute of Animal Science, RDA, Cheonan, Korea
- P0917** Conception Rates after Timed Embryo Transfer with Frozen-thawed *in vivo* Produced Embryos from Dairy Cattle under the South Korea Climate Conditions
Jihwan LEE¹, Kyungsuk LEE¹, Junkyu SON¹, Doosan KIM¹, Eunjung CHOI¹, Donghyun KIM¹, Jayeon YOO², Gulwon JANG¹, Manhye HAN¹
¹Dairy Science Division, National Institute of Animal Science, RDA, Cheonan, Korea, ²Animal Products Research and Development Division, National Institute of Animal Science, RDA, Jeonju, Korea
- P0918** Development of Human-mouse Chimeric Antibodies Recognizing the SARS-CoV-2 Spike Protein
Minjung CHOI, Chaeyoon HA, Se-Ho PARK
 Department of Life Sciences, Korea University, Seoul, Korea
- P0919** Establishment of Potent Neutralizing Antibodies against SARS-CoV-2
Chaeyoon HA, Minjung CHOI, Se-ho PARK
 Department of Life Sciences, Korea University, Seoul, Korea
- P0920** Development of Optimal Pretreatment Methods for the Quantification of Food-and-mouth Disease Virus Particles Using High Performance Liquid Chromatography (HPLC)
Jong Sook JIN, Ah-Young KIM, Sun Young PARK, Sang Hyun PARK, Jong-Hyeon PARK, Young-Joon KO
 Center for FMD Vaccine Research, Animal and Plant Quarantine Agency, Gimcheon, Korea
- P0921** Development of Chemically Defined Media for CHO Cell Culture
Ji Yun PARK, Duk Jae OH
 Department of Integrative Bioscience & Biotechnology, Sejong University, Seoul, Korea
- P0922** Replication of *Oryctes Rhinoceros Nudivirus* by Hydrogen Peroxide
Se-Young CHO¹, Jina CHOI², Haneul CHOI¹, Hyomin SEO¹, Hanbyeol KIM¹, Duwoon KIM¹
¹Department of Food Science and Technology, Foodborne Virus Research Center, Chonnam National University, Gwangju, Korea, ²BIO3S, Inc., Gwangju, Korea
- P0923** Development of Porcine Antibodies against Foot-and-Mouth Disease Virus (FMDV) Using Phage Display for Serodiagnosis of FMDV
Kyung Jin MIN^{1,2}, Inkyu HWANG², Sang Jick KIM¹
¹Synthetic Biology and Bioengineering Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Daejeon, Korea, ²College of Pharmacy, Chungnam National University, Daejeon, Korea