




Personal Information

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Position	Professor	
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Education

1994-1998	Ph.D.	University of Sydney, Australia (Major: Microbiology)
1991-1993	M.S.	University of Sydney, Australia
1985-1989	B.S.	Korea University, Seoul, Korea

Experience

2007-	Professor, Department of Biotechnology Adjunct Professor, Department of Medicine Head, Institute of Life Science and Natural Resources Korea University, Seoul, KOREA
2005-2006	Senior Researcher, Molecular Microbiology and Biotechnology Group Research Institute of Innovative Technology for the Earth (RITE), JAPAN
2002-2004	Researcher, Section of Molecular and Cellular Biology University of California, Davis, USA
1999-2001	Postdoctoral Research Associate, Dept. of Microbiology University of Oklahoma, Norman, USA

Professional Activities

- Korean Society for Biotechnology and Bioengineering (KSBB)
- Asian Federation of Biotechnology (AFOB)
- Korean Society for Microbiology and Biotechnology
- The Microbiological Society of Korea
- The American Society for Microbiology (ASM)
- European Federation of Biotechnology (EFB)

Research Interests

- Industrial Microbiology, Metabolic Engineering, Biochemical Engineering,
- Enzyme Engineering, Synthetic Biology, Systems biology Biomaterials, Biorefinery



Recently Published Articles (last 3 yrs)

*Corresponding Author

- Lee M, Ko YJ, Hwang D, Cho B, Jeong W, Bhardwaj N, **Han SO***. (2022) Surface display of enzyme complex on *Corynebacterium glutamicum* as a whole cell biocatalyst and its consolidated bioprocessing using fungal-pretreated lignocellulosic biomass. **Bioresource Technology**. 362:127758 (IF=11.889; JCR ranking Top 6.6%)
- Shi X, Park HM, Kim M, Lee M, Jeong W, Chang J, Cho B, **Han SO***. (2022) Isopropanol biosynthesis from crude glycerol using fatty acid precursors via engineered oleaginous yeast *Yarrowia lipolytica*. **Microbial Cell Factories**. 21:168 (IF=6.352)
- Hwang DH, Lee M, Cho B, Oh JW, You SK, Ko YJ, Hyeon JE, **Han SO***. (2022) Enhanced biodegradation of waste poly(ethylene terephthalate) using a reinforced plastic degrading enzyme complex. **Science of the Total Environment**. 842:156890 (IF=10.753; JCR ranking Top 9.1%)
- Ko YJ, Cha J, Jeong W, Lee M, Cho B, Nisha B, Jeong HJ, Park SE, **Han SO***. (2022) Bioisopropanol production in *Corynebacterium glutamicum*: Metabolic redesign of synthetic bypasses and two-stage fermentation with gas stripping. **Bioresource Technology**. 354:127171 (IF=11.889; JCR ranking Top 6.6%)
- Kim M, Jeong DW, Oh JW, Jeong HJ, Ko YJ, Park SE, **Han SO***. (2022) Efficient synthesis of food-derived antioxidant L-ergothioneine by engineered *Corynebacterium glutamicum*. **ACS Journal of Agricultural and Food Chemistry**. 70:1516-1524 (IF=5.595; JCR ranking Top 9.3%)
- Sun H, Han J, Jo Y, **Han SO**, Hyeon JE. (2022) Increased thermal stability of the carbonic anhydrase enzyme complex for the efficient reduction of CO₂ through cyclization and polymerization by peptide bonding. *Process Biochemistry*. 120:195–201 (IF=3.757)
- Lee YJ, Tran PHN, Ko JK, Gong G, Um Y, **Han SO**, Lee S. (2022) Glucose/xylose co-fermenting *Saccharomyces cerevisiae* increases the production of acetyl-CoA derived n-butanol from lignocellulosic biomass. *Frontiers in Bioengineering and Biotechnology*. 10:826787 (IF=5.890)
- Kim J, Son HF, Hwang S, Gong G, Ko JK, Um Y, **Han SO**, Lee S. (2022) Improving lipid production of *Yarrowia lipolytica* by the aldehyde dehydrogenase-mediated furfural detoxification. *International Journal of Molecular Sciences*. 23:4761 (IF=5.924)
- Ko YJ, Kim M, You SK, Shin SK, Chang J, Choi HJ, Jeong W, Lee M, Hwang D, **Han SO***. (2021) Animal-free heme production for artificial meat in *Corynebacterium glutamicum* via systems metabolic and membrane engineering. **Metabolic Engineering**. 66:217-228 (IF=9.783; JCR ranking Top 4.3%)
- You SK, Park HM, Lee M, Ko YJ, Hwang D, Oh JW, **Han SO***. (2021) Non-photosynthetic CO₂ utilization to increase fatty acid production in *Yarrowia lipolytica*. **ACS Journal of Agricultural and Food Chemistry**. 69:11912-11918 (IF=5.279; JCR ranking Top 7.8%)
- Jeong DW, Hyeon JE, Lee M, Ko YJ, Kim M, **Han SO***. (2021) Efficient utilization of brown algae for the production of polyhydroxybutyrate (PHB) by using an enzyme complex immobilized on *Ralstonia eutropha*. **International Journal of Biological Macromolecules**. 189:819-825 (IF=6.953)



- Kim M, Ko YJ, Jeong DW, Jeong W, **Han SO***. (2021) Eco-friendly synthesis of L-carnosine in metabolically engineered *Corynebacterium glutamicum* by reinforcing precursor accumulation. **ACS Synthetic Biology**. 10:1553-1562 (IF=5.110; JCR ranking Top 11.0%)
- Lee M, Shin SK, Oh J, Hwang D, Ko YJ, Hyeon JE, **Han SO***. (2021) Enzymatic production of sugar from fungi and fungi-infected lignocellulosic biomass by a new cellulosomal enzyme harboring N-acetyl- β -D-glucosaminidase activity. **Bioresource Technology**. 319:124242 (IF=9.642; JCR ranking Top 7.4%)
- Shin SK, Ko YJ, Jeong DW, Lee M, You SK, Hyeon JE, **Han SO***. (2021) Enhanced production of polyhydroxybutyrate from syngas by using nanoscaled cellulose particles with a syngas-converting enzyme complex immobilized on *Ralstonia eutropha*. **Journal of Cleaner Production**. 285:124903 (IF=9.297; JCR ranking Top 7.0%)
- You SK, Ko YJ, Shin SK, Hwang D, Kang DH, Park HM, **Han SO***. (2020) Enhanced CO₂ fixation and lipid production of *Chlorella vulgaris* through the carbonic anhydrase complex. **Bioresource Technology**. 318:124072 (IF=9.642; JCR ranking Top 7.4%)
- Jeong DW, Hyeon JE, Shin SK, **Han SO***. (2020) A trienzymatic complex system for isomerization of agar-derived D-galactose into D-tagatose as a low-calorie sweetener. **ACS Journal of Agricultural and Food Chemistry**. 68:3195-3202 (IF=4.192; JCR ranking Top 6.0%)
- Choi HS, Yang X, Liu G, Kim DS, Yang JH, Lee JH, **Han SO**, Lee J, Kim SW. (2020) Development of Co-hemin MOF/chitosan composite based biosensor for rapid detection of lactose. *Journal of the Taiwan Institute of Chemical Engineers*. 113:1-7 (IF=4.794)
- Choi HS, Yang X, Kim DS, Yang JH, **Han SO**, Park C, Kim SW. (2020) Power generation from cheese whey using enzymatic fuel cell. *Journal of Cleaner Production*. 254:120181 (IF=7.246)
- Yook SD, Kim J, Gong G, Ko JK, Um Y, **Han SO**, Lee S. (2020) High-yield lipid production from lignocellulosic biomass using engineered xylose-utilizing *Yarrowia lipolytica*. *GCB Bioenergy*. 12:670-679 (IF=5.060)
- Shin SK, Ko YJ, Hyeon JE, **Han SO***. (2019) Studies of advanced lignin valorization based on various types of lignolytic enzymes and microbes. **Bioresource Technology**. 289:121728 (IF=6.960; JCR ranking Top 8.3%)
- Seok J, Ko YJ, Lee M, Hyeon JE, **Han SO***. (2019) Systems metabolic engineering of *Corynebacterium glutamicum* for the bioproduction of biliverdin via protoporphyrin independent pathway. **Journal of Biological Engineering**. 129:181-186 (IF=5.256; JCR ranking Top 9.49 %)
- Shin SK, Hyeon JE, Joo YC, Jeong DW, You SK, **Han SO***. (2019) Effective melanin degradation by a synergistic laccase-peroxidase enzyme complex for skin whitening and other practical applications. **International Journal of Biological Macromolecules**. 129:181-186 (IF=4.784)
- Ko YJ, You SK, Kim M, Lee E, Shin SK, Park HM, **Han SO***. (2019) Enhanced production of 5-aminolevulinic acid via flux redistribution of TCA cycle toward L-glutamate in *Corynebacterium glutamicum*. **Biotechnology and Bioprocess Engineering**. 24: 915-923 (IF=2.213)
- Lee JH, Kim HR, Lee JH, Lee SK, Chun Y, **Han SO**, Yoo HY, Park C, Kim SW. (2019) Enhanced in-vitro hemozoin polymerization by optimized process using histidine-rich protein II (HRPII). *Polymers*. 11:1162 (IF=3.164)



Recently Registered Patents (last 3 yrs)

*primary inventor

- Agarase-3,6-anhydro-L-galactosidase-arabinose isomerase enzyme complex and method for production of tagatose from agar using the same; Inventor: ***Han SO**, Jeong DW, Hyeon JE; Reg # **USA 11,248,221 B2; Korea 10-2124317** (Feb. 15, 2022)
- Variant microorganism for producing L-cysteine and method for preparing L-Cysteine using thereof; Inventor: ***Han SO**, You S, Joo Y, Hyeon JE; Reg # **CHINA ZL201680079541.5** (Dec. 21, 2021)
- Recombinant microorganism having enhanced ability to produce heme, coproporphyrin III, and uroporphyrin III, and method for producing heme, coproporphyrin III, and uroporphyrin III using same; Inventor: ***Han SO**, Ko YJ; Reg # **USA 11,193,152 B2; Korea 10-2052134** (Dec. 7, 2022)
- Chitinolytic enzyme derived from *Clostridium cellulovorans*; Inventor: ***Han SO**, Lee M; Reg # **USA 11,124,784 B2; Korea 10-2217406** (Sep. 21, 2021)
- Enzyme complex comprising heme polymerase and heme ligase, and method for producing hemozoin using same; Inventor: ***Han SO**, Hyeon JE, Ko YJ; Reg # **USA 11,085,034 B2; Korea 10-1864350** (Aug. 10, 2021)
- Expansin-agarase enzyme complex and method for degrading agar by using same; Inventor: ***Han SO**, Jeong DW, Hyeon JE; Reg # **USA 11,072,788 B2; Korea 10-1855961** (Jul. 27, 2021)
- Recombinant *Corynebacterium* capable of producing biliverdin IX-alpha and method of producing biliverdin IX-alpha using the same; Inventor: ***Han SO**, Seok J, Ko YJ; Reg # **USA 11,066,683 B2; Korea 10-2198107** (Jul. 20, 2021)
- Mutant microorganism for producing L-cysteine and method for producing L-cysteine using same; Inventor: ***Han SO**, You SK, Joo YC, Hyeon JE; Reg # **USA 10,676,768 B2** (Jun. 9, 2020)
- Alginolytic enzyme complex and method for preparing thereof; Inventor: ***Han SO**, Lee MJ, Jeong DW, Hyeon JE; Reg # **Korea 10-2154123** (Sep. 3, 2020)
- Variant microorganism producing 5-aminolevulinic acid and method for preparing 5-aminolevulinic acid using thereof; Inventor: ***Han SO**, Ko YJ, Hyeon JE, You SK; Reg # **USA 10,351,885 B2** (Jul. 16, 2019)
- Enzyme complex of laccase and dye-decolorizing peroxidase and use for skin whitening thereof; Inventor: ***Han SO**, Shin SK; Reg # **Korea 10-2052132** (Nov. 28, 2019)
- Carbonic anhydrase mutant having enhanced thermostability and activity; Inventor: ***Han SO**, Ko YJ, Seo JG; Reg # **Korea 10-1884384** (Jul. 26, 2018)