

Sang-Han Lee, Ph.D.



Name in full: Sang-Han Lee, Ph.D.

Date of Birth: September 23, 1960

Present title: (1) Professor of Enzyme Biotechnology, (2) Director of Food and Bio-industry Research Institute, (3) Team Leader, BK21 plus Creative Group for Leading Future Functional Food, (4) CEO, knu BnC

Affiliation: School of Food Science & Biotechnology, Kyungpook National University, Daegu 41566, Republic of Korea

Education

1. Kyungpook National University, Department of Food Science & Biotechnology, Daegu, Korea (BS)
2. Kyungpook National University Graduate School, Daegu, Korea (MS)
3. University of Tokyo, Graduate School of Pharmaceutical Science, (Ph.D., Pharmaceutical-Life Science, Thesis: Identification and characterization of apoptotic soluble factors produced by lymph node stromal cells, thesis advisor: Prof. Takashi Tsuruo)

Research Career

1. Postdoc Scientist, Columbia University College of Physicians & Surgeons, Division of Medical Oncology (Sep. 1996-Sep. 1997)
2. Postdoc Fellow, Rockefeller University, Division of Immunology (Sep. 1997-Mar. 1999)
3. Principal Research Scientist, Korea Research Institute of Bioscience & Biotechnology, Lab of Biomolecules (Mar. 2000-Jan. 2005)
4. Visiting Scholar, Human Nutrition Research Center on Aging at Tufts University
5. Visiting Professor, Shizuoka University, Japan (Aug. 2016-Feb. 2017)

Professional Membership

1. Am Soc for Cell Biol, Member (Jan. 2009-present)
2. Soc. of Biomol. Scr., Member (Jan. 2003-present)
3. Kor. Soc. Microbiol. Biotechnol., Member (Jan. 2006-present)
4. Kor. Soc. Biochem. Mol. Biol., Member (Mar. 1983-present)

Publications (selected papers from more than 250 international papers)

Alam MB, Chowdhury NS, Sohrab MH, Rana MS, Hasan CM, **Lee SH**. Cerevisterol Alleviates Inflammation via Suppression of MAPK/NF- κ B/AP-1 and Activation of the Nrf2/HO-1 Signaling Cascade. *Biomolecules*, 10, 199, 2020.

Son HU, Yoon EK, Yoo CY, Park CH, Bae MA, Kim TH, Lee CH, Lee KW, Seo H, Kim KJ, **Lee SH**. Effects of Synergistic Inhibition on α -glucosidase by Phytoalexins

in Soybeans. *Biomolecules*, 9, 828, 2019.

Ju MK, Alam MB, Kwon YK, **Lee SH**. Protopine attenuates inflammation stimulated by carrageenan and LPS via the MAPK/NF- κ B pathway. *Food Chem Toxicol*, 131, 110583, 2019.

Kwon KR, Alam MB, Park JH, Kim TH, **Lee SH**. Attenuation of UVB-induced Photoaging by polyphenolic rich *Spatholobus suberectus* stem extract via modulation of MAPK/AP-1/MMPs signaling in human keratinocytes. *Nutrients*, 11, 1341, 2019.

Alam MB, Bajpai VK, Ra JS, Lim JY, An H, Shukla S, Quan KT, Khan I, Huh YS, Han YK, Na M, **Lee SH**. Anthraquinone-type inhibitor of α -glucosidase enhances glucose uptake by activating an insulin-like signaling pathway in C2C12 myotubes. *Food Chem. Toxicol.*, 129, 337-343, 2019.

Zhao P, Alam MB, **Lee SH**. Protection of UVB-Induced Photoaging by Fuzhuan-Brick Tea Aqueous Extract via MAPKs/Nrf2-Mediated Down-Regulation of MMP-1. *Nutrients*, 11, 60, 2019.

Alam MB, An H, Ra JS, Lim JY, Lee SH, Yoo CY, **Lee SH**. Gossypol from Cottonseeds Ameliorates Glucose Uptake by Mimicking Insulin Signaling and Improves Glucose Homeostasis in Mice with Streptozotocin-Induced Diabetes. *Oxid. Med. Cell. Longev.*, 2018, 5796102, 2018.

Kwak H, An H, Alam MB, Choi WS, Lee SY, **Lee SH**. Inhibition of Migration in Mouse and Human Melanoma Cells by b-Escin via an ERK/NF- κ B Signaling Pathway. *Biol. Pharm. Bull.*, 41(10), 1606-1610, 2018.

Alam MB, Majumder R, Kim SH, **Lee SH**. Attenuation of melanogenesis by *Nymphaea nouchali* (Burm. f) flower extract through the regulation of cAMP/CREB/MAPKs/MITF and proteasomal degradation of tyrosinase. *Sci. Rep.*, 8, 13928, 2018.

Byeon JH, Alam MB, Kim KC, Heo S, Lim JY, Kwon YG, Zhao P, Cha YH, Choi HJ, **Lee SH**. Anti-melanogenic effects by chestnut spike extract through downregulation of tyrosinase-related proteins and activation of ERK 1/2. *Nat. Prod. Commun.*, 13(8), 1023-1026, 2018.

Bajpai VK, Alam MB, Ju MK, Kwon KR, Huh YS, Han YK, **Lee SH**. Antioxidant mechanism of polyphenol-rich *Nymphaea nouchali* leaf extract protecting DNA damage and attenuating oxidative stress-induced cell death via Nrf2-mediated heme-oxygenase-1 induction coupled with ERK/p38 signaling pathway. *Biomed. Pharmacother.*, 103, 1397-1407, 2018.

Bajpai VK, Alam MB, Quan KT, Choi HJ, An H, Ju MK, **Lee SH**, Huh YS, Han YK, Na MK. Cytotoxic properties of the anthraquinone derivatives isolated from the roots of *Rubia philippinensis*. *BMC Compl. Altern. Med.*, 18, 200, 2018.

Bajpai VK, Alam MB, Quan KT, Ju MK, Majumder R, Shukla S, Huh YS, Na MK, Han YK, **Lee SH**. Attenuation of inflammatory responses by (+)-syringaresinol via MAP-kinase-mediated suppression of NF- κ B signaling in vitro and in vivo. *Sci. Rep.*, 8, 9216, 2018.

Baek SH, Joung O, Lee HY, Shin JC, Choi WS, Lee TH, Hwang JS, Nam SH, Son HU, **Lee SH**. Anti-oxidative Fraction of *Lycorma delicatula* Alleviates Inflammatory Indicators. *Nat. Prod. Commun.*, 13(4), 431-434, 2018.

Hwang IW, Kim BM, Kim YC, **Lee SH**, Chung SK. Improvement in β -glucan extraction from *Ganoderma lucidum* with high-pressure steaming and enzymatic pre-treatment. *Appl. Biol. Chem.*, 61, 235-242, 2018.

Peijun Zhao, Md Badrul Alam, Hongyan An, Hee-Jeong Choi, Yeong Ho Cha, Chi-Yeol Yoo, Hyo-Hyun Kim, **Sang-Han Lee**. Antimelanogenic effect of an *Oroxylum indicum* seed extract by suppression of MITF expression through activation of MAPK signaling protein. *Int. J. Mol. Sci.*, 19(3), 760, 2018.

Rahmana MS, Choi YH, Choi YS, Alam MB, **Lee SH**, Yoo JC. A novel antioxidant peptide, purified from *Bacillus amyloliquefaciens*, showed strong antioxidant potential via Nrf-2 mediated heme oxygenase-1 expression. *Food Chem.*, 239, 502-510, 2018.

Kim TH, Jeong CG, Son HU, Huh MI, Kim SY, Kim HK, **Lee SH**. Ethanol extract of *Rubus coreanus* fruits inhibits bone marrow-derived osteoclast differentiation and lipopolysaccharide-induced bone loss, *Nat. Prod. Commun.*, 12(12), 1925-1928, 2017.

Alam MB, Bajpai VK, Lee JI, Zhao P, Byeon JH, Ra JS, Majumder R, Lee JS, Yoon JI, Rather IA, Park YH, Kim K, Na M, **Lee SH**. Inhibition of melanogenesis by jineol from *Scolopendra subspinipes Mutilans* via MAP-kinase mediated MITF downregulation and the proteasomal degradation of tyrosinase. *Sci. Rep.*, 7, 45858, 2017.

Bajpai VK, Alam MB, Quan KT, Kwon KR, Ju MK, Choi HJ, Lee JS, Yoon JI, Majumder R, Kim K, **Lee SH** (co-corresponding author), Na M. Antioxidant efficacy and the upregulation of Nrf2-mediated HO-1 expression by (+)-lariciresinol, a lignan isolated from *Rubia philippinensis*, through the activation of p38. *Sci. Rep.*, 7, 46035, 2017.

Alam MB, Ju MK, **Lee SH**. DNA Protecting Activities of *Nymphaea nouchali* (Burm. f) Flower Extract Attenuate t-BHP-Induced Oxidative Stress Cell Death through Nrf2-Mediated Induction of Heme Oxygenase-1 Expression by Activating MAP-Kinases, *Int. J. Mol. Sci.*, 18(10), 2069, 2017.

Choi WS, Lee TH, Son SJ, Kim TG, Kwon BM, Son HU, Kim SU, **Lee SH**. Inhibitory effect of obovatol from *Magnolia obovata* on the Salmonella type III secretion system. *J. Antibiot.(Tokyo)*, 70(11), 1065-1069, 2017.

Park CH, Son HU, Yoo CY, **Lee SH**. Low molecular-weight gel fraction of Aloe vera exhibits gastroprotection by inducing matrix metalloproteinase-9 inhibitory activity in alcohol-induced acute gastric lesion tissues. *Pharm. Biol.*, 55(1), 2110-2115, 2017.

Peijun Z, Alam MB, Lee Sh, Kim YJ, Lee S, An H, Choi HJ, Son HU, Park CH, Kim HH, **Lee SH**. *Spatholobus suberectus* Exhibits Antidiabetic Activity In Vitro and In Vivo through Activation of AKT-AMPK Pathway, *Evi.-Based Compl. Altern. Med.*, 2017, 6091923, 2017.

Son HU, Lee S, Heo JC, **Lee SH**. The solid-state fermentation of *Artemisia capillaris* leaves with *Ganoderma lucidum* enhances the anti-inflammatory effects in a model of atopic dermatitis. *Int. J. Mol. Med.*, 37, 1233-1241, 2017.

Seo SU, Cho HK, Min KJ, Woo SM, Kim S, Park JW, Kim SH, Choi YH, Keum YS, Hyun JW, Park HH, **Lee SH**, Kim DE, Kwon TK. Thioridazine enhances sensitivity to carboplatin in human head and neck cancer cells through downregulation of c-FLIP and Mcl-1 expression. *Cell Death Dis.*, 8(2):e2599, 2017.

Alam MB, Kwon KR, Lee SH, **Lee SH**. *Lannea coromandelica* (Houtt.) Merr. Induces Heme Oxygenase 1 (HO-1) Expression and Reduces Oxidative Stress via the p38/c-Jun N-Terminal Kinase-Nuclear Factor Erythroid 2-Related Factor 2 (p38/JNK-NRF2)-Mediated Antioxidant Pathway. *Int. J. Mol. Sci.*, 18(2), E266, 2017.

Chun K, Kim SO, **Lee SH**. Analgesic effects of 1,2,3,4,6-penta-O-galloyl- β -D-glucose in an animal model of lipopolysaccharide-induced pain. *Int. J. Mol. Med.*, 38, 1264-1270, 2016.

Baek SH, **Lee SH**. Omeprazole inhibits melanin biosynthesis in melan-a cells and zebrafish. *Exp. Dermatol.*, 25(3), 239-241, 2016.

Baek SH, Choi SW, Park SJ, **Lee SH**, Kim SH. Quinoline compound KM11073 enhances BMP-2-dependent osteogenic differentiation of C2C12 cells via activation of p38 signaling and exhibits *in vivo* bone forming activity. *PLoS One*, 10(3), e0120150, 2016.

Baek SH, **Lee SH**. Sesamol decreases melanin biosynthesis in melanocyte cells and zebrafish: Possible involvement of MITF via the intracellular cAMP and p38/ JNK signaling pathways. *Exp. Dermatol.*, 24(10), 761-766, 2015.

Baek SH, Nam IJ, Kwak HS, Kim KC, **Lee SH**. Cellular anti-melanogenic effects of a *Euryale ferox* seed extract ethyl acetate fraction via the lysosomal degradation machinery. *Int. J. Mol. Sci.*, 16(5), 9217-9235, 2015.

Alam MB, Majumder R, Akter S, **Lee SH**. *Piper betle* extracts exhibit antitumor activity by augmenting antioxidant potential. *Oncol. Lett.*, 9(2), 863-868, 2015.

Shin YK, Son HU, Kim JM, Heo JC, **Lee SH**, Kim JG. *Cinnamomum cassia* bark

produced by solid-state fermentation with *Phellinus baumii* has potential to alleviate atopic dermatitis-related symptoms. *Int. J. Mol. Med.*, 35, 187-194, 2015.

Kim YW, Baek SH, **Lee SH**, Kim TH, Kim SY. Fucoidan, a sulfated polysaccharide, inhibits osteoclast differentiation and function by modulating RANKL signaling. *Int. J. Mol. Sci.*, 15, 18840-18855, 2014.

Baek SH, Ahn JW, Nam SH, Yoon CS, Shin JC, **Lee SH**. S-(-)-10,11-dihydroxyfarnesoic acid methyl ester inhibits melanin synthesis in murine melanocyte cells. *Int. J. Mol. Sci.*, 15(7), 12750-12763, 2014.

Yoon EK, Jeong YT, Li X, Cui S, Park DC, Kim YH, Chang HW, **Lee SH** (co-corresponding author), Hwang SL. Glyceollin improves endoplasmic reticulum stress-induced insulin resistance through CaMKK-AMPK pathway in L6 myotubes. *J. Nutr. Biochem.*, 24(6), 1053-1061, 2013.

Heo JC, **Lee S-H**. Alleviation of asthma-related symptoms by a derivative of L-allo threonine. *Int. J. Mol. Med.*, 31(4), 881-887, 2013.

Shin DK, Kim MH, **Lee SH**, Kim TH, Kim SY. Inhibitory effects of luteolin on titanium-particle-induced osteolysis in a mouse model. *Acta. Biomaterialia*, 8, 3524-3531, 2012.

Woo, J-H., Park, J-W., Lee, S-H., Kim, Y-H., Lee, I. K., Gabrielson, E., **Lee SH**, Lee, H.-J., Kho, Y.-H., and Kwon, T. K. Dykellic Acid Inhibits Phorbol Myristate Acetate-induced Matrix Metalloproteinase-9 Expression. *Cancer Res.*, 63, 3430-3434, 2003.

Lee SH, Lee, C.W., Hong, D.H., Han, S.B., Jung, S.-H., Kim, H.C., Fine, R.L., and Kim, H.M. Novel stereo-selective sulfonylureas, 1-(1-Benzoylindoline-5-sulfonyl)-4-phenyl -4,5-dehydroimidazolone has antitumor efficacy in *in vitro* and *in vivo* tumor models. *Biochem. Pharmacol.*, 64, 473-480, 2002.

Lee DS, and **Lee SH**. Genistein, a soy isoflavone, is a potent alpha-glucosidase inhibitor. *FEBS Lett.*, 501, 84-86, 2001.

Lee SH, Fujita, N., and Tsuruo, T. Activation of CPP-32-like protease during L1210 cell apoptosis induced by thiol deprivation. *Apoptosis*, 2, 77-83, 1997.

Lee SH, Fujita N, Mashima T, Tsuruo T. Interleukin-7 inhibits apoptosis of mouse malignant T-lymphoma cells by both suppressing the CPP32-like protease activation and inducing the Bcl-2 expression. *Oncogene*, 13, 2131-2139, 1996.

Hanaoka K, Fujita N, **Lee SH**, Seimiya H, Naito M, Tsuruo T. Involvement of CD45 in adhesion and suppression of apoptosis of mouse malignant T-lymphoma cells. *Cancer Res.*, 55, 2186-2190, 1995.