

Curriculum Vitae

Kyong-Su Park (박경서)

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Personal statement

I am currently senior researcher at Prof. Jan Lötvall's lab, University of Gothenburg, and my research interests involve the development of a comprehensive understanding of extracellular vesicles (EV) from mammalian and bacteria with over 15 years experiences in molecular biology, microbiology and immunology. Especially, I pursue to develop the technology to manipulate synthetic eukaryotic vesicles (SyEV) and synthetic bacterial vesicles (SyBV), and then translate the SyEV/SyBV platform into specific therapeutics for inflammation and cancer. During predoctoral course supervised by Prof. Yong Song Gho at Pohang University of Science and Technology, I focused on establishment of EV isolation and characterization protocol and the functional role of EV in the pathogenesis of bacterial infectious diseases such as sepsis and pneumonia. Also, I developed EV-based vaccine materials to have a protective role against inflammation and cancer. After graduation, I worked in Hanmi Pharmaceutical Co., Ltd. to accumulate clinical experience and especially focused on clinical development strategy for anti-diabetic and -obesity drugs. During my research in Prof. Jan Lötvall's lab, I have been working on engineered stem cell-derived SyEV or modified bacterial SyBV to enhance immunotherapeutic function against inflammation and cancer without any adverse effects. Also, I am involved in a biotechnology company (Exocure Biosciences Inc.) as a consultant to provide advice about artificial vesicle-based drug development.

Education

- Mar 2007 – Feb 2014 **Ph.D.**, Department of Life Science, Division of Molecular and Life Sciences, Pohang University of Science and Technology, Pohang, Republic of Korea
- Mar 2003 – Feb 2007 **B.S.**, Department of Life Science, Pohang University of Science and Technology, Pohang, Republic of Korea

Mar 2000 – Feb 2003 Incheon Science High School, Incheon, Republic of Korea

Professional Experience

- Oct 2021 – Present **Consultant**, Vesiclebio AB, Sweden
- May 2019 – Present **Consultant**, Exocure Biosciences Inc., Boston, MA, USA
- Apr 2019 – Apr 2019 **Consultant**, MDimune Inc., Seoul, Republic of Korea
- Mar 2018 – Present **Researcher**, Krefting Research Centre, University of Gothenburg, Gothenburg, Sweden
- Feb 2016 – Feb 2018 **Post-doctoral research fellow**, Krefting Research Centre, University of Gothenburg, Gothenburg, Sweden
- Aug 2014 – Feb 2016 **Researcher**, Clinical research strategy, Hanmi Pharmaceutical Co., Ltd., Seoul, Republic of Korea
- Mar 2014 – Aug 2014 **Post-doctoral research fellow**, Pohang University of Science and Technology, Pohang, Republic of Korea

Publication

First author & Corresponding author

- **Park KS**, Bergqvist M, Lässer C, Lötval J. Targeting Myd88 using peptide-loaded mesenchymal stem cell membrane-derived synthetic vesicles to treat systemic inflammation. *Journal of Nanobiotechnology* 2022;20:451.
- **Park KS**, Svennerholm K, Crescitelli R, Lässer C, Jang SC, Gribonika I, Lötval J. Synthetic bacterial vesicles combined with tumour extracellular vesicles as cancer immunotherapy. *Journal of Extracellular Vesicles* 2021;10:e12120.
- **Park KS**, Bandeira E, Shelke GV, Lässer C, Lötval J. Enhancement of therapeutic potential of mesenchymal stem cell-derived extracellular vesicles. *Stem Cell Research & Therapy* 2019;10:288.
- **Park KS**, Svennerholm K, Shelke GV, Bandeira E, Lässer C, Jang SC, Chandode R, Gribonika I, Lötval J. Mesenchymal stromal cell-derived nanovesicles ameliorate bacterial outer membrane vesicle-induced sepsis via IL-10. *Stem Cell Research & Therapy* 2019;10:231.

First author

- **Park KS**, Lee J, Lee CG, Park HT, Kim JW, Kim OY, Jang SC, Kim SR, Rådinger

M, Jung HY, Park JS, Lötvall J, Gho YS. Sepsis-like systemic inflammation induced by nano-sized extracellular vesicles from feces. *Frontiers in Microbiology* 2018;9:1735.

- **Park KS**, Svennerholm K, Wikström J, Lässer C, Crescitelli R, Shelke GV, Jang SC, Suzuki S, Bandeira E, Olofsson CS, Lötvall J. Escherichia coli outer membrane vesicles can contribute to sepsis induced cardiac dysfunction. *Scientific Reports* 2017;7:17434.
- **Park KS**, Lee J, Jang SC, Kim SR, Jang MH, Lötvall J, Kim YK, Gho YS. Pulmonary inflammation induced by bacteria-free outer membrane vesicles from Pseudomonas aeruginosa. *American journal of respiratory cell and molecular biology* 2013;49:637-645.
- **Park KS**, Choi KH, Kim YS, Hong BS, Kim OY, Kim JH, Yoon CM, Koh GY, Kim YK, Gho YS. Outer membrane vesicles derived from Escherichia coli induce systemic inflammatory response syndrome. *PLoS One* 2010;5:e11334.

Co-author

- Lässer C, Kishino Y, **Park KS**, Shelke GV, Karimi N, Suzuki S, Hovhannisyanyan L, Rådinger M, Lötvall J. Immune-Associated Proteins Are Enriched in Lung Tissue-Derived Extracellular Vesicles during Allergen-Induced Eosinophilic Airway Inflammation. *International Journal of Molecular Sciences* 2021;22:4718
- Marion C, Lee J, Sharma L, **Park KS**, Lee CJ, Liu W, Liu P, Feng K, Gho YS, Cruz CD. Toll-like Receptors 2 and 4 Modulate Pulmonary Inflammation and Host Factors Mediated by Outer Membrane Vesicles derived from Acinetobacter baumannii. *Infection and Immunity* 2019;87:e00243
- Yoon YJ, Kim JH, Lee J, **Park KS**, Park HT, Dinh NTH, Go G, Lee CG, Di Vizio D, Gho YS. Outer membrane vesicles derived from Escherichia coli regulate neutrophil migration by induction of endothelial IL-8. *Frontiers in Microbiology* 2018;9:2268.
- Kim JH, Lee J, **Park KS**, Hong SW, Gho YS. Drug repositioning to alleviate systemic inflammatory response syndrome caused by Gram-negative bacterial outer membrane vesicles. *Advanced Healthcare Materials* 2018;7:e1701476.
- Kim OY, Choi SJ, Jang SC, **Park KS**, Kim SR, Choi JP, Lim JH, Lee SW, Park J,

Di Vizio D, Lötvall J, Kim YK, Gho YS. Bacterial protoplast-derived nanovesicles as vaccine delivery system against bacterial infection. *Nano Letters* 2015;15:266-274.

- Jang SC, Kim SR, Yoon YJ, **Park KS**, Kim JH, Lee J, Kim OY, Choi EJ, Kim DK, Choi DS, Kim YK, Park J, Di Vizio D, Gho YS. In vivo kinetic biodistribution of nano-sized outer membrane vesicles derived from bacteria. *Small* 2015;11:456-461.
- Kim DK, Lee J, Kim SR, Choi DS, Yoon YJ, Kim JH, Go G, Nhung D, Hong K, Jang SC, Kim SH, **Park KS**, Kim OY, Gho YS. EVpedia: a community web portal for extracellular vesicles research. *Bioinformatics* 2015;31:933-939.
- Kim JH, Yoon YJ, Lee J, Choi EJ, Yi N, **Park KS**, Park J, Lötvall J, Kim YK, Gho YS. Outer membrane vesicles derived from *Escherichia coli* up-regulate expression of endothelial cell adhesion molecules in vitro and in vivo. *PLoS One* 2013;8:e59276.
- Kim OY, Hong BS, **Park KS**, Yoon YJ, Choi SJ, Lee WH, Roh TY, Lötvall J, Kim YK, Gho YS. Immunization with *Escherichia coli* outer membrane vesicles protects bacteria-induced lethality via th1 and th17 cell responses. *Journal of Immunology* 2013;190:4092-4102.
- Lee J, Lee EY, Kim SH, Kim DK, **Park KS**, Kim KP, Kim YK, Roh TY, Gho YS. *Staphylococcus aureus* extracellular vesicles carry biologically active beta-lactamase. *Antimicrobial agents and chemotherapy* 2013;57:2589-2595.
- Kim DK KB, Kim OY, Choi DS, Lee J, Kim SR, Go GY, Yoon YJ, Kim JH, Jang SC, **Park KS**, Choi EJ, Kim KP, Desiderio DM, Kim YK, Lötvall J, Hwang DH, Gho YS. Evpedia: An integrated database of high-throughput data for systemic analyses of extracellular vesicles. *Journal of Extracellular Vesicles* 2013;2:20384.
- Lee EY, **Park KS**, Yoon YJ, Lee J, Moon HG, Jang SC, Choi KH, Kim YK, Gho YS. Therapeutic effects of autologous tumor-derived nanovesicles on melanoma growth and metastasis. *PLoS One* 2012;7:e33330.
- Lee EY, Bang JY, Park GW, Choi DS, Kang JS, Kim HJ, **Park KS**, Lee JO, Kim YK, Kwon KH, Kim KP, Gho YS. Global proteomic profiling of native outer membrane vesicles derived from *Escherichia coli*. *Proteomics* 2007;7:3143-3153.

Patent

- **Park KS**, Lötvall J, Lässer C. Recombinant Cell Line Expressing Anti-Inflammatory Membrane Proteins and Vesicles Prepared Therefrom.
 - U.S. Provisional Application Serial No. 63/301,233, 2022
- **Park KS**, Lötvall J, Bergqvist M. Vesicles and Uses Thereof.
 - PCT: WO 2022/019585, 2022
- **Park KS**, Lötvall J. Bacteria-Derived Vesicles and Use Thereof for Generating Immune Response to SARS-COV-2.
 - PCT: WO 2022/011014, 2022
- **Park KS**, Lötvall J. Use of Ghost Nanovesicles as Therapeutics.
 - PCT: WO 2021/050975, 2021
 - Europe: 4013392, 2022
- **Park KS**, Crescitelli R, Lötvall J. Bacteria-Derived Vesicles and Uses Thereof.
 - PCT: WO 2020/146390, 2020
 - Europe: 3908262, 2021
 - China: 113677328, 2021
 - US: 2022-0080035 A1, 2022
- **Park KS**, Bandeira E, Lötvall J. Nanovesicles produced from mesenchymal stromal cells for anti-inflammatory applications.
 - US: US20200163998A1, 2020
- Gho YS, Kim YK, **Park KS**, Hong BS, Kim JH, Kim YS. Gut flora-derived extracellular vesicles, and method for searching for a disease model, vaccine, and candidate drug and for diagnosis using the same
 - Korea: KR101430283, 2014
 - Japan: JP5818793, 2015
 - China: CN102480932, 2015
 - US: US9201072, 2015

Presentation

Oral presentation

- **Park KS**. (2018) E. coli protoplast-derived nanovesicles and native outer membrane vesicles as vaccine in outer membrane vesicles-mediated septic mice

model, OMVaccines/Adjuvants 2018 Workshop, Cuba

- **Park KS**, Svennerholm K, Lötvall J. (2017) Outer membrane vesicles from *Escherichia coli* contributes to cardiac dysfunction in sepsis, The 3rd BiKiE Symposium, United Kingdom.
- **Park KS**. (2010) Identification of outer membrane vesicles derived from Gram-negative bacteria as key causative microbial signals in systemic inflammation, KAAACI Spring Congress & Korea-Japan Joint Symposium, Republic of Korea.

Poster presentation

- **Park KS**, Svennerholm K, Crescitelli R, Lässer C, Gribonika I, Lötvall J. (2020) Synergistic cancer immunotherapy using tumor tissue-derived exosomes and artificially produced bacterial outer membrane vesicles, The Society of Immunotherapy of Cancer's (SITC) annual meeting, USA.
- **Park KS**, Svennerholm K, Crescitelli R, Lässer C, Gribonika I, Lötvall J. (2020) Synergistic cancer immunotherapy using tumor tissue-derived exosomes and artificially produced bacterial outer membrane vesicles, American Association for Cancer Research (AACR) annual meeting, USA.
- **Park KS**, Lötvall J. (2019) The use of artificially produced bacterial vesicles as an immunotherapeutic vaccine against *Pseudomonas aeruginosa* pneumonia, The ISEV 2019 Meeting, Japan.
- **Park KS**, Shelke GV, Svennerholm K, Bandeira E, Lässer C, Jang SC, Chandode R, Gribonika I, Lötvall J. (2018) Anti-inflammatory activity of exosome-mimetic nanovesicles from mesenchymal stem cells in septic mice, The ISEV 2018 Meeting, Spain.
- **Park KS**, Svennerholm K, Wikström J, Lässer C, Crescitelli R, Shelke GV, Jang SC, Suzuki S, Bandeira E, Olofsson CS, Lötvall J. (2017) Outer membrane vesicles from *Escherichia coli* contributes to cardiac dysfunction in sepsis, Europe-Korea Conference on Science and Technology, Sweden.
- **Park KS**, Svennerholm K, Wikström J, Lässer C, Crescitelli R, Shelke GV, Jang SC, Suzuki S, Bandeira E, Olofsson CS, Lötvall J. (2017) Outer membrane vesicles from *Escherichia coli* contributes to cardiac dysfunction in sepsis, The ISEV 2017 Meeting, Canada.
- **Park KS**, Lötvall J, Gho YS. (2016) Extracellular vesicles from *Pseudomonas aeruginosa* elicit a potent innate immune response in the lung, Europe-Korea

Conference on Science and Technology, Germany

- **Park KS**, Lötval J, Gho YS. (2016) Extracellular vesicles from *Pseudomonas aeruginosa* elicit a potent innate immune response in the lung, The 2nd BiKiE Symposium, Germany
- **Park KS**, Kim JW, Lee JW, Kim OY, Jang SC, Kim SR, Kim SH, Rådinger M, Surh CD, Jang MH, Kim YK, Lötval J, Gho YS. (2014) Induction of peritoneal and sepsis-like systemic inflammation by bacteria-free extracellular vesicles from feces, The ISEV 2014 Meeting, Netherland.
- **Park KS**, Yoon YJ, Kim JH, Jang SC, Kim SR, Seo JH, Lötval J, Gho YS. (2014) How many beer extracellular vesicles are taken by human beings?, The ISEV 2014 Meeting, Netherland.
- **Park KS**, Lee JW, Lötval J, Kim YK, Gho YS. (2013) Gram-negative outer membrane vesicles elicit a potent innate immune response in the lung, The ISEV 2013 Meeting, USA.
- **Park KS**, Lee JW, Lee EY, Kim YK, Gho YS. (2012) Outer membrane vesicles derived from *Pseudomonas aeruginosa* induce lung inflammation, 2012 KSBMB Annual Meeting, Korea.
- **Park KS**, Kim JW, Lee JW, Lee EY, Kim YK, Gho YS. (2012) Identification of commensal bacteria-derived extracellular vesicles as inducers of peritoneal and systemic inflammation, 2012 KSBMB Annual Meeting, Korea.
- **Park KS**, Choi KH, Jang SC, Lee JW, Kim YS, Hong BS, Kim OY, Kim JH, Yoon CM, Kim YK, Gho YS. (2011) Identification of outer membrane vesicles derived from Gram-negative bacteria as key causative microbial signals in systemic inflammation, 2nd International Conference on Immune Tolerance, Netherland.
- **Park KS**, Cho JH, Kim JH, Hwang DH, Gho YS. (2009) Comparative exosomal and cellular genomic profiling of human colorectal cancer cells, 34th FEBS Congress, Crezch.

Award

- **Park KS**. (2018) Letter of Commendation from president of Korean Federation of Science & Technology Societies, Europe-Korea Conference on Science and

Technology, Scotland.

Research grants

Accepted

- Elucidating the pathogenesis mechanism and therapeutic target of septic cardiac dysfunction through functional study of bacterial outer membrane vesicle, The National Research Foundation of Korea (NRF) grant, 2017-2018 (0.4 million SEK).
- Travel grants funded by Heart and Lung foundation, Sweden, 2017-2019 (45,000 SEK).
- Engineered extracellular vesicles as therapeutics for respiratory disease, Heart and Lung foundation, Sweden, 2019-2021 (1.5 million SEK).
- Clinical translation of a SARS-CoV-2 vaccine based on engineered bacterial membrane nanovesicles, Heart and Lung foundation, Sweden, 2020 (0.25 million SEK).
- Synthetic bacterial vesicles as an immunological treatment platform, The Swedish Research Council, Sweden, 2021 (7.2 million SEK).

Submitted

- Synthetic Extracellular Vesicles as Targeted Intracellular Biologics, The Swedish Research Council, Sweden, 2022 (12 million SEK).

Positions

2013 – Present	Member of International Society for Extracellular Vesicles (ISEV)
2016 – 2017	Financial Director of Korean-Scandinavian Scientists and Engineers Association (KSSEA)
2016 – 2017	Financial Director of Europe-Korea Conference on Science and Technology (EKC) 2017