

Hye Kyung Lee, Ph.D.

Positions

- 05/2023 – present **Associate Scientist**
Section of Genetics and Physiology
LCMB/NIDDK/NIH
Bethesda, Maryland 20892
- 12/2020 – 05/2023 **Staff Scientist**
Section of Genetics and Physiology
LCMB/NIDDK/NIH
Bethesda, Maryland 20892

Experience

- 12/2015 – 12/2020 **Postdoctoral Fellow**
Laboratory of Genetics and Physiology
NIDDK/NIH
- 12/2008 – 08/2011 **Research Biologist**
Department of Cell and Developmental Biology
Seoul National University
- 02/2007 – 11/2008 **Research Biologist**
Department of Internal Medicine
Yonsei University & Seoul Clinical Laboratories
- 03/2005 – 01/2007 **Research Biologist**
Department of Bioscience and Biotechnology
Sejong University

Education

- 09/2011 – 08/2015 **Ph.D.**
Department of Cell and Developmental Biology
Seoul National University
- 03/2003 – 02/2005 **M.S.**
Department of Bioscience and Biotechnology
Sejong University
- 03/1999 – 02/2003 **B.S.**
Department of Bioscience and Biotechnology
Sejong University

Honors, Awards, and Recognitions (selection)

- Editorial board member, Toxicological Research (since 2024)
- Guest editor, Frontiers in Immunology (since 2023)
- People's Choice Award in poster section, [Lupus & KCR 2023 conference](#) (2023)
- Selected speaker, [NIH Future Research Leaders Conference](#) (2021)
- [ICIS Milstein Travel Award](#) of poster presentation, International Cytokine and Interferon Society in [Cytokines 2019 conference](#) (2019)
- President Award, The Korean-American Women in Science and Engineering ([KWiSE](#)) NIH-DC Joint Symposium, Korean-American Professional Association Life Sciences ([KAPAL](#)) (2019)
- [NIH FARE 2019 Award](#) (2018)
- President Award, NIH-Korean Scientists Association ([NIH-KSA](#)) (2017)
- [Korea Visiting Scientist Training Award](#) (Postdoctoral fellowship), Korean Government (2015-2017)

Invited Lectures

- Georgetown University, Washington DC, USA (2023)
- Technical University of Munich, Munich, Germany (2023)
- Genetoberfest, Munich, Germany (2023)
- Chonnam National University Hospital, Gwangju, Korea (2023)
- [NIH/FDA COVID-19 Research Workshop](#) (2022, 2020)
- NIH Transcription Interest Group Seminar (2022)
- NIH Staff Scientist Spotlight Seminar (2022)
- NIDDK/LCMB seminar (2022, 2021)
- National Institute of Infectious Diseases, Korea National Institute of Health, Korea Centers for Disease Control and Prevention, Osong, Korea (2022)
- Hanyang University Hospital, Seoul, Korea (2022)
- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea (2022)
- Asan Medical Center, Seoul, Korea (2022)
- The [FASEB Growth Hormone \(GH\)/Prolactin \(PRL\) Family in Biology and Disease Conference](#), USA (2021)
- Technische Universität München (TUM), Munich, Germany (2020)
- Annual Meeting of International Society of Precision Cancer Medicine (ISPCM), Seoul, Korea (2019)
- Annual NIDDK Scientific Conference (2019)
- University of Veterinary Medicine, Vienna, Austria (2019)
- Konkuk University, Seoul, Korea (2019)
- Sejong University, Seoul, Korea (2019)
- Chungang University, Seoul, Korea (2019)
- [NIH Research Festival](#) (2018)
- NCI Genetics Branch (2018)
- NIDDK special seminar for Base Editing (2018)
- Annual Meeting of Korean Basic Dental Science Society Association, Seoul, Korea (2018)

- Seoul National University, Seoul, Korea (2018)
- Kyunghee University Hospital, Seoul, Korea (2018)
- NCI Center of Excellence in Integrative Cancer Biology and Genomics Symposium, USA (2017)
- Annual NIH-Korean Scientists Association (NIH-KSA) Scientific Conference, USA (2017)

Service & Mentoring

Service

- NIDDK Staff Scientist advisory Board (since 2023)
- NIH's Sustainable Laboratory Practices Working Group (since 2023)
- [NIDDK IDEA-C advisory committee](#) (since 2022)
- Judge, codeathon, 'African Society for Bioinformatics and Computational Biology ([ASBCB](#)) and NIH Office of Data Science Strategy ([ODSS](#)) (2022-2023)
- Annual Judge, [NIH FARE](#) (since 2019)
- Annual Judge, [Annual NIDDK scientific conference](#) (since 2019)
- NIDDK Seminar Organization (2018 ~ 2019)
 - a. Shannon Miller, Harvard University
 - b. Joo-Cheol Park, Seoul National University, Korea
 - c. Julia Wilflingseder, University of Veterinary Medicine, Austria.
- Review manuscripts for Nature communications, Scientific reports, Frontiers in Immunology, iScience, Blood and others (since 2017, at least three papers per year)
- Korean-American Women in Science and Engineering ([KWise](#)) NIH Chapter leadership committee (2017-2019)
- NIH-Korean Scientists Association ([NIH-KSA](#)) leadership committee (2016-2022)

Peer mentoring for Next Generation Sequencing (NGS) and bioinformatic knowledge, experimental designs and analyses (their current positions)

1. So Young Bang, MD, PhD (since 2023): Associate Professor, Hanyang University, Korea
2. Woo Kyung Bae, MD, PhD (since 2022): Professor, Chonnam Medical School, Korea
3. Myong Suk Park, MS (since 2022): Research biologist, Chonnam National University, Korea
4. Jin Won Huh, MD, PhD (since 2021): Associate Professor, Asan Medical Center, Korea
5. Markus List (since 2019): Head of the research group big data, Technical University of Munich (TUM), Germany
6. Michaela Willi, PhD (2016-2019): Team leader Genetics, Bionorica, Austria
7. Ha Youn Shin, PhD (2016): Associate Professor, Konkuk University, Korea

Laboratory mentor for their study projects and experimental skills (their current positions)

1. Lindsey Njanja (since 2022): Post-bac, NIDDK
2. Jakub Jankowski, PhD (since 2020): Postdoctoral fellow, NIDDK
3. Markus Hoffmann (since 2020): PhD student, Technical University of Munich (TUM), Germany and NIDDK
4. Sojung Kim, PhD (2018-2019): Research biologist, Toolgen, Korea
5. Precious Achikeh (2017-2018): Medical student, Geisinger Commonwealth School of Medicine, USA

6. Tyler Kuhns, MD (2016 -2017): Physician, Residency, University of Washington
7. Fabian Reinisch (2016): PhD student, University of Frankfurt, Germany
8. Christian Reinbold (2016): PhD student, University of Heidelberg, Germany
9. Teresa Mohr, PhD (2016): Project Engineer, Pixon Engineering, Switzerland
10. Han Wool Choung, DDS, PhD (2012-2015): Dentist, Own Clinic, Korea
11. Ho Jae Choi, DDS, MS (2013-2015): Resident, Arizona school of dentistry
12. Ji Won Park, DDS, MS (2012-2014): Dentist, Own Clinic, Korea
13. Su Jin Park, PhD (2010-2016): Lecturer, Namseoul University & Dental hygienist, Korea
14. Hye Mi Kim (2010-2015): PhD student, Seoul National University, Korea
15. Hyun Jung Oh, PhD (2004-2014): Team leader, Yozma BioScience Holdings, Korea

Mentoring Mentees for their career development (their current positions)

1. Rayeh Elian (since 2023): Master student, Master's degree in Bioinformatics, Georgetown University
2. Rayane Dennaoui (since 2022): PhD student, Wayne State University School of Medicine
3. Jin Young Go, MD (since 2021): PhD student, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea
4. Jakub Jankowski, PhD (since 2020): Post-doc, NIDDK
5. Minji Sim, PhD (since 2019): Postdoctoral fellow, NCI
6. Su Jin Park, PhD (since 2010): Lecturer, Namseoul University & Dental hygienist, Korea
7. Hye Mi Kim (since 2010): PhD student, Seoul National University, Korea
8. Hyun Jung Oh, PhD (since 2004): Employee in Yozma BioScience Holdings, Korea

Bibliography

[ORCID](#)

[Google Scholar](#)

h-index: 22

total citations: >1,500

publications: 46

† Corresponding / co-corresponding author

* Co-first authorship

1. Schatz C, Knabl L, **Lee HK**, Seeboeck R, Laer DV, Lafon E, Borena W, Mangge H, Prüller F, Qerimi A, Wilflingseder D, Posch W, Haybaeck J. (2024) Machine Learning to Identify Critical Biomarker Profiles in New SARS-CoV-2 Variants. *Microorganisms* 12:798 ([DOI: 10.3390](#))
2. Lee SG, Furth PA, Hennighausen L, **Lee HK**. (2024) Variant- and Vaccination-Specific Alternative Splicing Profiles in SARS-CoV-2 Infections. *iScience*. 27:109177 ([PMID: 38414855](#))

3. Hoffmann M*, Willruth L*, Dietrich AD*, **Lee HK**, Knabl L, Trummer N, Baumbach J, Furth PA, Hennighausen L, List M. (2024) Blood transcriptomics analysis offers insights into variant-specific immune response to SARS-CoV-2. *Sci Rep.* 14:2808 ([PMID: 38307916](#))
4. **Lee HK**†, Willi M, Liu C, Hennighausen L†. (2023) Cell-specific and shared regulatory elements control a multigene locus active in mammary and salivary glands. *Nat Commun.* 14:4992 ([PMID: 37591874](#))
5. Hoffmann M, Schwartz L, Ciora OA, Trummer N, Willruth LL, Jankowski J, **Lee HK**, Baumbach J, Furth PA, Hennighausen L, List M. (2023) circRNA-sponging: a pipeline for extensive analysis of circRNA expression and their role in miRNA sponging. *Bioinform Adv.* 3:vbad093 ([PMID: 37485422](#))
6. **Lee HK***, Hoehstetter MA*, Buchner M*, Pham TT, Huh JW, Müller K, Zange S, Buttlar HV, Philipp Girl P, Wölfel R, Brandmeier L, Pfeuffer L, Furth PA, Wendtner C†, Hennighausen L†. (2023) Comprehensive analysis of immune responses in CLL patients after heterologous COVID-19 vaccination. *Blood Adv.* 7:2214-2227 ([PMID: 36630562](#))
7. Lee YS, Park YH, Seo YM, **Lee HK**, Park JC. (2023) Tubular dentin formation by TGF- β /BMP signaling in dental epithelial cells. *Oral Dis.* 29:1644-1656 ([PMID: 35199415](#))
8. Hoffmann M, Trummer N, Schwartz L, Jankowski J, **Lee HK**, Willruth LL, Lazareva O, Yuan K, Baumgarten N, Schmidt F, Baumbach J, Schulz MH, Blumenthal DB, Hennighausen L, List M. (2022) TF-Prioritizer: a Java pipeline to prioritize condition-specific transcription factors. *Gigascience.* 12:giad026 ([PMID: 37132521](#))
9. **Lee HK**†, Knabl L, Walter M, Furth PA, Hennighausen L†. (2022) Limited cross-variant immune response from SARS-CoV-2 Omicron BA.2 in naïve but not previously infected outpatients. *iScience.* 25:105369 ([PMID: 36267551](#))
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10. **Lee HK***,†, Knabl L*,†, Walter M, Dai Y, Knabl Sr. L, Füßl M, Caf Y, Jeller C, Knabl P, Obermoser M, Baurecht C, Kaiser N, Zabernigg A, Wurdinger GM, Furth PA†, Hennighausen L†. (2022) Prior vaccination exceeds prior infection in eliciting innate and humoral immune responses in Omicron infected outpatients. *Front Immunol.* 13:916686 ([PMID: 35784346](#))
Featured in [News Medical Life Sciences](#) (04/2022)
11. **Lee HK**†, Go J, Sung H, Kim SW, Walter M, Knabl L, Furth PA†, Hennighausen L† and Huh JW† (2022) Heterologous ChAdOx1-BNT162b2 vaccination in Korean cohort induces robust immune and antibody responses that includes Omicron. *iScience.* 25:104473 ([PMID: 35637788](#))
12. Knabl L*, **Lee HK***, Walter M, Furth PA, Hennighausen L. (2022) Immune transcriptome and antibody response in adult-onset Still's disease with mild flare following administration of mRNA vaccine BNT162b2. *Rheumatology.* 61:e305-e307 ([PMID: 35532082](#))

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[Picked up by four News Outlets](#)
14. **Lee HK***, †, Knabl L*, Knabl Sr. L, Kapferer S, Pateter B, Walter M, Furth PA †, Hennighausen L. † (2022) mRNA vaccination in octogenarian nuns 15 and 20 months after recovery from COVID-19 elicits robust immune and antibody responses that include Omicron. *Cell Rep.* 39:110680 ([PMID: 35395191](#))
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15. **Lee HK***, †, Knabl L*, Knabl Sr. L, Wieser M, Mur A, Zabernigg A, Schumacher J, Kaiser N, Furth PA, Hennighausen L † (2022) Immune transcriptome analysis of COVID-19 patients infected with SARS-CoV-2 variants carrying the E484K escape mutation identifies a distinct gene module. *Sci Rep.* 12:2784 ([PMID: 35181735](#))
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16. Jankowski J, **Lee HK**, Wilflingseder J, Hennighausen L. (2021) JAK inhibitors dampen activation of interferon-activated transcriptomes and the SARS-CoV-2 receptor ACE2 in human renal proximal tubules. *iScience*, 24:102928 ([PMID: 34345808](#))
17. **Lee HK**, Jung O, Hennighausen L. (2021) JAK inhibitors dampen activation of interferon-stimulated transcription of ACE2 isoforms in human airway epithelial cells. *Commun Biol.* 4:654 ([PMID: 34079039](#))
18. **Lee HK** †, Willi M, Kuhns T, Liu C, Hennighausen L †. (2021) Redundant and non-redundant cytokine-activated enhancers control Csn1s2b expression in the lactating mouse mammary gland. *Nat Commun.* 12:2239 ([PMID: 33854063](#))
19. **Lee HK***, Knabl L*, †, Pipperger L, Volland A, Furth PA, Kang K, Smith HE, Knabl Sr. L, Bellmann R, Bernhard C, Kaiser N, Gänzer H, Ströhle M, Walser A, Laer DV and Lothar Hennighausen †. (2021) Immune transcriptomes of highly exposed SARS-CoV-2 asymptomatic seropositive versus seronegative individuals from the Ischgl community. *Sci Rep.* 11:4243 ([PMID: 33608566](#))
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21. Wilflingseder J, Willi M, **Lee HK**, Olauson H, Jankowski J, Ichimura T, Erben R, Valerius MT, Hennighausen L, Bonventre JV. (2020) Enhancer and super-enhancer dynamics in repair after ischemic acute kidney injury. *Nat Commun.* 11:3383 ([PMID: 32636391](#))

22. Zeng X*, **Lee HK***,†, Wang C*, Achikeh P, Liu C, Hennighausen L†. (2020) The interdependence of mammary-specific super-enhancers and their native promoters facilitates gene activation during pregnancy. *Exp Mol Med.* 52:682-690. ([PMID: 32321991](#))
23. **Lee HK**†, Smith HE, Liu C, Willi M†, Hennighausen L†. (2020) Cytosine base editor 4 but not adenine base editor generates off-target mutations in mouse embryos. *Commun Biol.* 3:19. ([PMID: 31925293](#))
24. **Lee HK**†, Willi M, Smith HE, Miller SM, Liu DR, Liu C, Hennighausen L†. (2019) Simultaneous targeting of linked loci in mouse embryos using base editing. *Sci Rep.* 9:1662. ([PMID: 30733567](#))
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25. **Lee HK**†, Willi M, Miller SM, Kim S, Liu C, Liu DR, Hennighausen L†. (2018) Targeting fidelity of adenine and cytosine base editors in the mouse embryos. *Nat Commun.* 9:4804. ([PMID: 30442934](#))
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26. **Lee HK***,†, Willi M*, Shin HY, Liu C, Hennighausen L†. (2018) Progressing super-enhancer landscape during mammary differentiation controls tissue-specific gene regulation. *Nucleic Acids Res.* 46:10796-10809. ([PMID: 30285185](#))
27. **Lee HK**, Kim SJ, Kim YH, Ko YK, Ji S, Park JC. (2018) Odontogenic ameloblast-associated protein (ODAM) in gingival crevicular fluid for site-specific diagnostic value of periodontitis: a pilot study. *BMC Oral Health.* 18:148. ([PMID: 30143043](#))
28. Park SJ, **Lee HK**, Seo YM, Son C, Bae HS, Park JC. (2018) Dentin sialophosphoprotein expression in enamel is regulated by Copine-7, a preameloblast-derived factor. *Arch Oral Biol.* 86:131-137. ([PMID: 29223640](#))
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31. Willi M, Yoo KH, Reinisch F, Kuhns TM, **Lee HK**, Wang C, Hennighausen L. (2017) Facultative CTCF sites moderate mammary super-enhancer activity and regulate juxtaposed gene in non-mammary cells. *Nat Commun.* 8:16069. ([PMID: 28714474](#))
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34. **Lee HK**, Park JW, Seo YM, Kim HH, Lee G, Bae HS, Park JC. (2016) Odontoblastic inductive potential of epithelial cells derived from human deciduous dental pulp. *J Mol Histol.* 47:345-51. ([PMID: 27098651](#))
35. Choung HW, Lee DS, **Lee HK**, Shon WJ, Park JC. (2016) Preameloblast-derived factors mediate osteoblast differentiation of human bone marrow mesenchymal stem cells by Runx2-Osterix-BSP signaling. *Tissue Eng Part A.* 22:93-102. ([PMID: 26413977](#))
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37. Seymen F, Park JC, Lee KE, **Lee HK**, Lee DS, Koruyucu M, Gencay K, Bayram M, Tuna EB, Lee ZH, Kim YJ, Kim JW. (2015) Novel MMP20 and KLK4 mutations in amelogenesis imperfecta. *J Dent Res.* 94:1063-9. ([PMID: 26124219](#))
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IB (BMPR-IB), is implicated in ameloblast differentiation. *J Cell Biochem.* 113:1754-65. ([PMID: 22213140](#))

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46. Kim ES, Hong SY, **Lee HK**, Kim SW, An MJ, Lee KR, Kim WH, Cheon JH. (2008) Guggulsterone inhibits angiogenesis by blocking STAT3 and VEGF expression in colon cancer cells. *Oncol Rep.* 20:1321-7. ([PMID: 19020709](#))
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