

## CURRICULUM VITAE

**Jaegu Yi (이재우), Ph.D.**

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### Research Summary

My research focuses on how mucosal antigens regulate CD4<sup>+</sup> T cell responses under homeostasis and inflammation. I integrate TCR/16S sequencing with in vivo and in vitro antigen discovery platforms, including retroviral TCR reconstitution and pMHCII CAR tools, to dissect antigen-specific T cell responses in complex mucosal environments. My long-term goal is to establish a comprehensive map of dietary-, commensal- and self-derived antigens that regulate intestinal immune tolerance and homeostasis.

### Research Keywords

Mucosal T cells, Microbial antigens, Dietary antigens, TCR repertoire, Bidirectional interactions between diet and microbiota, T cell antigen discovery, inflammatory disorders, MHCII antigen presentation

### Selected Publications

1. Yi J, Jung J, Hsieh C-S *et. al.*, *Immunity*. 2025 (IF, 26.3)
2. Yi J, Miller AT, Wu GF, Hsieh CS *et. al.*, *Science Immunology*, 2022, (IF, 30.6)
3. Yi J, Sprent J, Surh CD *et. al.*, *Proc Natl Acad Sci USA*. 2019
4. Yi J, Lee YJ *et. al.*, *Mol Cells*. 2019
5. Yi J and Hsieh CS. *J Exp Med*. 2023 (Review)
6. Yi J, Kawabe T, and Sprent J, *Curr opin in Immunol*. 2020 (Review)
7. Jung J, Yi J (corresponding), *Immune Network*, 2025 (Review)

### Funding

1. Principal Investigator, Excellent Young Researcher Project (우수신진) (RS-2025-00515400), 2025.3-2030.2
2. Sub-project Investigator, Basic Science Research Program (RS-2021-NR060141) 2025.3-2026.2

### Job experience

**2024.9~Present:** Assistant Professor, Department of Biological Science, Ajou University, Korea

**2023.7~ 2024.8:** Staff Scientist in the Hsieh lab, Washington University in St. Louis (WashU), USA

**2019.3~ 2023.6:** Postdoc research associate in the Hsieh lab, WashU, USA

## Education

2012.3 – 2019.2 Graduate student in Surh laboratory

Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea

Academic advisor: The late Charles D. Surh (POSTECH, La Jolla Institute for Immunology)

You Jeong Lee (Seoul National University)

Research supervisor after Prof. Surh passed away

: Jonathan Sprent (Garvan Institute of medical research, Australia)

2005.3 – 2012.2 (undergraduate course)

Kyungpook National University, Daegu, Republic of Korea

B.A., Life & Food Sciences / B.S., Life Sciences & Biotechnology

## Full Publication list

1. Jung J, Yi J, A novel approach of T cell receptor classification reveals dynamic interactions amongst diet, microbiota, and host T cells. **Immune Netw.** 2025 Aug;**25(4):e27**.
2. Yi J, Jung J, Hsieh P, Horton D, Peng P, Newberry R, Ericsson A, Kim KS, Kau A, and Hsieh C-S, A hierarchy of intestinal antigens instructs the CD4<sup>+</sup> T cell receptor repertoire. **Immunity.** 2025 May 2:S1074-7613(25)00174-8
3. Akihisa Kawajiri, Jing Li, Keita Koinuma, Ziyang Yang, Hye Jin Yoon, **Jaew Yi**, Hiroyuki Nagashima, Minami Ishii, Feng Gao, Kosuke Sato, Shunichi Tayama, Hideo Harigae, Yoichiro Iwakura, Naoto Ishii, Alan Sher, Kazuyoshi Ishigaki, Jinfang Zhu, Kwang Soon Kim, Takeshi Kawabe. Naturally arising memory-phenotype CD4<sup>+</sup> T lymphocytes contain an undifferentiated population that can generate TH1, TH17, and Treg cells. **Sci Adv.** 2024 Dec 6;10(49):eadq6618.
4. Yi J, Hsieh CS. How decreasing T cell signaling unexpectedly results in autoimmunity. **J Exp Med.** 2023 Feb 6;220(2):e20221886. doi: 10.1084/jem.20221886
5. Yi J, Miller AT, Archambault AS, Jones AJ, Bradstreet TR, Bandla S, Hsu YS, Edelson BT, Zhou YW, Fremont DH, Egawa T, Singh N, Wu GF, Hsieh CS. Antigen-specific depletion of CD4<sup>+</sup> T cells by CAR T cells reveals distinct roles of higher- and lower-affinity TCRs during autoimmunity. **Sci Immunol.** 2022 Oct 14;7(76):eabo0777 (**Cover article**).
6. Russler-Germain EV, Jung J, Miller AT, Young S, Yi J, Wehmeier A, Fox LE, Monte KJ, Chai JN, Kulkarni DH, Funkhouser-Jones LJ, Wilke G, Durai V, Zinselmeyer BH, Czepielewski RS, Greco S, Murphy KM, Newberry RD, Sibley LD, Hsieh CS. Commensal *Cryptosporidium* colonization elicits a cDC1-dependent Th1 response that promotes intestinal homeostasis and limits other infections. **Immunity.** 2021 Nov 9;54(11):2547-2564.e7.
7. Kawabe T, Yi J, Sprent J. Homeostasis of Naïve and Memory T lymphocytes. **Cold Spring Harb Perspect Biol.** 2021 Mar 22:a037879.
8. Russler-Germain EV, Yi J, Young S, Nutsch K, Wong HS, Ai TL, Chai JN, Durai V, Kaplan DH, Germain RN, Murphy KM, Hsieh CS. Gut *Helicobacter* presentation by multiple dendritic cell subsets enables context-specific regulatory T cell generation. **Elife.** 2021 Feb 3;10:e54792.
9. Kawabe T, Yi J, Kawajiri A, Hilligan K, Fang D, Ishii N, Yamane H, Zhu J, Jankovic D, Kim KS, Trinchieri G, Sher A. Requirements for the differentiation of innate T-bet high memory-phenotype CD4<sup>+</sup> T lymphocytes under steady state. **Nat Commun.** 2020 Jul 6;11(1):3366.

10. **Yi J**, Kawabe T, Sprent J. New insights on T-cell self-tolerance. **Curr Opin Immunol**. 2020 Apr;63:14-20
11. Hong SW, O E, Lee JY, **Yi J**, Cho K, Kim J, Kim D, Surh CD, Kim KS. Interleukin-2/antibody complex expanding Foxp3<sup>+</sup> regulatory T cells exacerbates Th2-mediated allergic airway inflammation. **BMB Rep**. 2019 Apr;52(4):283-288
12. **Yi J**, Jung J, Han D, Surh CD, Lee YJ. Segmented Filamentous Bacteria Induce Divergent Populations of Antigen-Specific CD4 T Cells in the Small Intestine. **Mol Cells**. 2019 Mar 31;42(3):228-236.
13. **Yi J**, Jung J, Hong S-W, Lee JY, Han D, Kim KS, Sprent J, Surh CD. Unregulated APC activation by T cells breaks self-tolerance. **Proc Natl Acad Sci U S A**. 2019 Jan 15;116(3):1007-1016
14. Verma R, Lee CH, Jeun EJ, **Yi J**, Kim KS, Ghosh A, Byun SH, Lee CG, Kang HJ, Gi- Kim C, Jun CD, Jan G, Suh CH, Jung JY, Sprent J, Rudra D, Castro CD, Molinaro A, Surh CD, Im SH. Cell surface polysaccharides of *Bifidobacterium bifidum* induce the generation of Foxp3<sup>+</sup> regulatory T Cells. **Sci Immunol**. 2018 Oct 19;3(28)
15. Lee JY, Kim J, **Yi J**, Kim D, Kim HO, Han D, Sprent J, Lee YJ, Surh CD, Cho JH. Phenotypic and functional changes of peripheral Ly6C<sup>+</sup> T regulatory cells driven by conventional effector T cells. **Front Immunol**. 2018 Mar 16;9:437.
16. Han D, Walsh MC, Kim KS, Hong SW, Lee J, **Yi J**, Rivas G, Choi Y, Surh CD. Dendritic cell expression of the signaling molecule TRAF6 is required for immune tolerance in the lung. **Int Immunol**. 2017 Mar 11.
17. Kim KS, Hong SW, Han D, **Yi J**, Jung J, Yang BG, Lee JY, Lee M, Surh CD. Dietary antigens limit mucosal immunity by inducing regulatory T cells in the small intestine. **Science**. 2016 Feb 19;351(6275):858-63.
18. Han D, Walsh MC, Kim KS, Hong SW, Lee J, **Yi J**, Rivas G, Surh CD, Choi Y. Microbiota-Independent Ameliorative Effects of Antibiotics on Spontaneous Th2-Associated Pathology of the Small Intestine. **PLoS One**. 2015 Feb 17;10(2): e0118795.

### Poster presentation

1. Poster presentation, 2024, Cytokine & KAI joint meeting, Korea
2. Poster presentation, 2023, KAI international meeting, Korea
3. Poster presentation, 2023, The 61<sup>st</sup> Midwinter Conference of Immunologists at Asilomar, Pacific Grove, USA
4. Poster presentation, 2022, International Congress of Mucosal Immunology, Seattle, USA
5. Poster presentation, 2016, The 45<sup>th</sup> Annual Meeting of the Japanese Society for Immunology, Okinawa, Japan
6. Poster presentation, 2016, The 16<sup>th</sup> International Congress of Immunology, Melbourne, Australia
7. Poster presentation, 2015, Fall Conference of the Korean Association of Immunologists, Seoul, Republic of Korea
8. Poster presentation, 2015, Keystone Symposia on T cells: Regulation and Effector function, Utah, USA

## Talks

1. Irregular Seminar, School of Pharmacy, Seoul National University, 2025
2. Emerging Faculty Forum in 2025 Ajou Bio-Health Science Research week
3. Irregular Seminar, Jeonbuk National University, 2025, Korea
4. 대한 소화기학회 및 대한 면역학회 조인트 심포지엄, 2025, Korea
5. The 21th Research symposium on human defense system in conjunction with the 3rd symposium of the Yonsei human microbiome center, 2025, Korea
6. Bric Webinar, Aug 29th, 2025, Korea
7. 2025년 제2차 T세포 연구회 심포지엄, 한양대학교
8. Gyeonggi Science High school for the Gifted, 2025, Suwon, Korea
9. Regular seminar, 2025, Pusan National University, Korea
10. New faculty session, 2025, KAI spring meeting, Seoul, Korea
11. Regular Seminar, 2025, School of Life Sciences, GIST, Korea
12. Irregular Seminar, 2024, Department of Bio and Brain Engineering, KAIST, Korea
13. Oral abstract sessions, 2024, International Congress of Mucosal Immunology, Copenhagen, Denmark
14. Regular Seminar, 2023, Department of Biotechnology, Yonsei University, Korea
15. Young investigator session, 2023 KAI international meeting, Korea
16. Online Seminar, 2023, Korea University college of medicine, Korea
17. ESNI Journal club with authors, 2023, European School of Neuroimmunology.
18. Gnotobiotics Workshop, 2023, Washington University school of medicine, St. Louis, USA
19. Immunology program retreat, 2022, Washington University school of medicine, Potosi, USA
20. Oral abstract sessions, 2022, International Congress of Mucosal Immunology, Seattle, USA
21. Fall seminar series, 2020, Department of Pharmaceutical Sciences, Southern Illinois University-School of Pharmacy, USA