

Seong-Jun Kang, Ph.D.

Immunologist working in multiplexed protein and RNA measurement, in situ and at single-cell scale

Postdoctoral Associate applicant · Bathe Lab, MIT Department of Biological Engineering

101 Canal Street

Boston, MA 02114

(551) 239-0341

sjkang89@gmail.com

PROFESSIONAL STATUS

I measure molecular composition in intact samples, one unit at a time, and I check that the result holds on data the model has not seen. The unit has been a cell or a tissue region.

RESEARCH OBJECTIVES

to carry multiplexed in situ measurement into human iPSC-derived models at screening scale, and to keep donor and batch structure separated from biology while doing it.

SCIENTIFIC INTERESTS

multiplexed protein and RNA detection in situ (GeoMx, Olink, 24-color flow); consensus NMF for cell-state programs; isoform-level calling from short reads; multi-donor study design; calibrated models checked on held-out data.

EDUCATION

DEGREES

Ph.D.
2014–2023 **Seoul National University**, Seoul, Republic of Korea
Department of Biomedical Sciences
Thesis: Exploration of the Regulatory T-cell Role in Various Pathogenic Contexts
Advisor: Chung-Gyu Park, M.D., Ph.D.

M.S.
2012–2014 **Seoul National University**, Seoul, Republic of Korea
Department of Biomedical Sciences
Thesis: Enhanced LPS-Induced Monocyte Activation by Recombinant Human Soluble CD14
Advisor: Chung-Gyu Park, M.D., Ph.D.

B.S.
2008–2012 **Sungkyunkwan University**, Suwon, Republic of Korea
Department of Genetic Engineering

RESEARCH & PROFESSIONAL EXPERIENCE

Researcher (postdoctoral)
2025–2026 **Yonsei University Wonju College of Medicine** · Dept. of Physiology / Organelle Medicine Research Center, Wonju, Republic of Korea
Developed deep-learning multimodal-integration models fusing imaging, transcriptomic, and clinical data into single predictive models.

Associate Director
2023–2025 **PB Immune Therapeutics Inc.** · Dept. of Basic Research, Seoul, Republic of Korea
Built in-house single-cell & spatial transcriptomics analysis code from scratch; led cross-functional NHP (cynomolgus, marmoset) EAE/multiple-sclerosis multi-omic studies; oversaw regulatory documentation for an anti-CD40 humanized-antibody program.

Manager
2021–2023 **PB Immune Therapeutics Inc.** · Dept. of Basic Research, Seoul, Republic of Korea

Researcher
2019–2021 **Xenotransplantation Research Center, Seoul National University**, Seoul, Republic of Korea
Rhesus macaque tissue processing, longitudinal immune monitoring, and CNS (brain/spinal cord) tissue handling for immunological analysis.

Research Student
2020–2023 **SCAID, Single Cell Atlas of Immune Diseases**, Genomic Medicine Institute, Seoul National University, Seoul, Republic of Korea
Contributed the founding proposal; executed within the funded program (700+ donors × 8 organs): milestone tracking, multi-site QC, multi-PI coordination.

Teaching Assistant
2014–2016 **Seoul National University College of Medicine** · Dept. of Microbiology and Immunology, Seoul, Republic of Korea

PUBLICATIONS

18 TOTAL PAPERS	17 PEER-REVIEWED	1 IN REVISION	6 FIRST / CO-FIRST
--------------------	---------------------	------------------	-----------------------

 [Google Scholar · Full Profile, Citations & h-index ↗](#)

SELECTED PUBLICATIONS · FIRST / CO-FIRST AUTHOR

- 2026** Woogil Song*, **Seong-Jun Kang***, Taehee Stella Kim*, Seyoung Jung, Sung Hee Kim, Su Chan Park, Sung Hae Chang, Eun Young Lee, Tae-Gyun Kim, Hyun Je Kim, Jeong Seok Lee. "Conserved PDE4D short-isoform bias defines pathogenic Th1.17 state across human inflammatory diseases." *Nature Immunology*. IF 27.7 [in revision](#)
First author (co-first). Built custom UMI-aware, BAM-level analysis code (Python) that resolves PDE4D short- vs long-isoform identity from 5' scRNA-seq; consensus NMF programs; scRNA + scTCR + snATAC integration; disease-state ML classifier (AUC 0.780); cross-disease meta-analysis across the SCAID atlas (702 samples, 23 diseases). 251,055 memory CD4⁺ T cells.
- 2025** **Seong-Jun Kang***, Yong-Hee Kim*, Thuy Nguyen-Phuong*, Yijoon Kim, Jin-Mi Oh, Jae-chun Go, DaeSik Kim, Chung-Gyu Park, Hyunsu Lee, Hyun Je Kim. "Immune cell-enriched single-cell RNA sequencing unveils the interplay between infiltrated CD8⁺ T resident memory cells and choroid plexus epithelial cells in Alzheimer's disease." *Journal of Neuroimmunology*. IF 2.9 [Download PDF](#)
First author (co-first). Built the complete brain-immune single-cell analysis path (whole-brain harvest → enzymatic digestion → Percoll enrichment → FACS → 10x → analysis); identified exhausted CD8⁺ tissue-resident memory T cells engaging choroid-plexus epithelium (↑ MHC-I and interferon-stimulated genes) at the blood-CSF barrier. 11,587 cells, 10 immune populations.
- 2025** **Seong-Jun Kang***, Jeong-Ryeol Gong*, Seon-Pil Jin, Jin-Mi Oh, Hyunjin Jin, Yuji Lee, Yewon Moon, Dongjun Kim, Hyo Jeong Nam, Hyun Seung Choi, Sanha Hwang, Yun Jung Huh, Kyung Yeon Han, Jihwan Moon, Jongsuk Chung, Woong-Yang Park, Chung-Gyu Park, Hyun Je Kim, Jeong Eun Kim. "Deciphering Dysfunctional Regulatory T Cells in Atopic Dermatitis." *Allergy*. IF 12.6 [Download PDF](#)
First author (co-first). Single-cell and functional dissection of dysfunctional skin-homing (CLA⁺) regulatory T cells in atopic dermatitis; OX40 (TNFRSF4) up-regulated alongside impaired suppressive function.
- 2024** Jong-Min Kim*, **Seong-Jun Kang***, So-Hee Hong, Hyunwoo Chung, Jun-Seop Shin, Byoung-Hoon Min, Hyun Je Kim, Jongwon Ha, Chung-Gyu Park. "Long-term control of diabetes by tofacitinib-based immunosuppressive regimen after allo-islet transplantation in diabetic rhesus monkeys that rejected previously transplanted porcine islets." *Xenotransplantation*. IF 3.9 [Download PDF](#)
First author (co-first). Long-term diabetes control with a tofacitinib-based regimen after allo-islet transplantation in rhesus macaques; longitudinal immune monitoring.
- 2022** Youngkyoung Lim*, **Seong-Jun Kang***, Bum Keun Cho, Hyun Je Kim, Chung-Gyu Park. "Intra-tumoral heterogeneity and immune escape of melanoma arising from congenital melanocytic nevus revealed by spatial gene expression profiling." *JEADV*. IF 9.2 [Download PDF](#)
First author (co-first). Spatial gene-expression profiling of nevus-arising melanoma; depth-dependent intra-tumoral heterogeneity and immune escape.
- 2019** Jong Min Kim, Jun Seop Shin, Byoung Hoon Min, **Seong-Jun Kang***, Il Hee Yoon, Hyunwoo Chung, Jiyeon Kim, Eung Soo Hwang, Jongwon Ha, Chung Gyu Park. "JAK3 inhibitor-based immunosuppression in allogeneic islet transplantation in cynomolgus monkeys." *Islets*. IF 2.2 [Download PDF](#)
First author (co-first). JAK3-inhibitor-based immunosuppression in allogeneic islet transplantation in cynomolgus macaques.

CONTRIBUTING AUTHOR

2026	Jung Ho Lee*, Sung Ha Lim*, Hyungdon Kook, Seong-Jun Kang , Geon Lee, Brian Hyohyoung Lee, Hyunsung Nam, YongJun Kim, Christine Suh-Yun Joh, Soyoung Jeong, Dongryeol Shin, Hyun Je Kim, Jiyoung Ahn. "Mycosis Fungoides-like Atopic Dermatitis Represents a Th22-dominant Inflammatory Endotype." <i>Allergy</i> . IF 12.6 <i>Performed the scRNA-seq & scTCR-seq analysis (scVI cross-dataset integration with public MF/AD cohorts, InferCNV genomic-identity inference, scTCR clonality). Showed mfAD is a reactive, oligoclonal Th22 endotype rather than a malignancy, responsive to JAK1 inhibition. 248,881 cells.</i>
2024	Brian Hyohyoung Lee*, Yoon Ji Bang*, Sung Ha Lim*, Seong-Jun Kang , Sung Hee Kim, Seunghee Kim-Schulze, Chung-Gyu Park, Hyun Je Kim, Tae-Gyun Kim. "High-dimensional profiling of regulatory T cells in psoriasis reveals an impaired skin-trafficking property." <i>eBioMedicine</i> . IF 11.1 Download PDF <i>Co-author. High-dimensional immune profiling of regulatory T cells in psoriasis, revealing an impaired skin-trafficking phenotype.</i>
2024	Youngkyoung Lim*, Beom Keun Cho*, Seong-Jun Kang , Soyoung Jeong, Hyun Je Kim, Jiyeon Baek, Ji Hwan Moon, Cheol Lee, Chan-Sik Park, Je-Ho Mun, Chong Hyun Won, Chung-Gyu Park. "Spatial transcriptomic analysis of tumour-immune cell interactions in melanoma arising from congenital melanocytic nevus." <i>JEADV</i> . IF 9.2 Download PDF <i>Co-author. Spatial transcriptomic (GeoMx) analysis of tumour-immune cell interactions in nevus-arising melanoma.</i>
2023	Sunyoung Jung*, Sunho Lee, Hyun Je Kim, Sueon Kim, Ji Hwan Moon, Hyunwoo Chung, Seong-Jun Kang , Chung-Gyu Park. "Mesenchymal stem cell-derived extracellular vesicles subvert Th17 cells by destabilizing RORyt through posttranslational modification." <i>Experimental & Molecular Medicine</i> . IF 12.8 <i>Co-author. MSC-derived extracellular vesicles suppress Th17 cells by destabilizing RORyt via post-translational modification.</i>
2022	Sangho Lee, Han-Teo Lee, Young Ah Kim, Il-Hwan Lee, Seong-Jun Kang , Kyeongpyo Sim, Chung-Gyu Park, Kyungho Choi, Hong-Duk Youn. "The optimized core peptide derived from CABIN1 efficiently inhibits calcineurin-mediated T-cell activation." <i>Experimental & Molecular Medicine</i> . IF 12.8 <i>Co-author. An optimized CABIN1-derived core peptide inhibits calcineurin-mediated T-cell activation.</i>
2021	So Hee Hong, Hyun Je Kim, Seong-Jun Kang , Chung-Gyu Park. "Novel Immunomodulatory Approaches for Porcine Islet Xenotransplantation." <i>Current Diabetes Reports</i> . IF 4.2 Download PDF <i>Co-author. Review of novel immunomodulatory strategies for porcine islet xenotransplantation.</i>
2020	Sunho Lee, Sueon Kim, Hyunwoo Chung, Ji Hwan Moon, Seong-Jun Kang , Chung-Gyu Park. "Mesenchymal stem cell-derived exosomes suppress proliferation of T cells by inducing cell cycle arrest through p27kip1/Cdk2 signaling." <i>Immunology Letters</i> . IF 4.4 <i>Co-author. MSC-derived exosomes suppress T-cell proliferation through p27kip1/Cdk2-mediated cell-cycle arrest.</i>
2019	Hyun Je Kim, Ji Hwan Moon, Hyunwoo Chung, Jun-Seop Shin, Bongi Kim, Jong Min Kim, Jung-Sik Kim, Il-Hee Yoon, Byoung-Hoon Min, Seong-Jun Kang , Yong-Hee Kim, Kyuri Jo, Joungmin Choi, Heejoon Chae, Won Woo Lee, Sun Kim, Chung-Gyu Park. "Bioinformatic analysis of peripheral blood RNA-sequencing sensitively detects the cause of late graft loss following overt hyperglycemia in pig-to-non-human primate islet xenotransplantation." <i>Scientific Reports</i> . IF 4.6 <i>Co-author. Bioinformatic analysis of peripheral-blood RNA-seq to detect causes of late graft loss in pig-to-NHP islet xenotransplantation.</i>
2018	Byoung-Hoon Min, Jun-Seop Shin, Jong-Min Kim, Seong-Jun Kang , Hyun-Je Kim, Il-Hee Yoon, Su-Kyoung Park, Ji-won Choi, Min-Suk Lee, Chung-Gyu Park. "Delayed revascularization of islets after transplantation by IL-6 blockade in pig-to-non-human primate islet xenotransplantation model." <i>Xenotransplantation</i> . IF 3.9 <i>Co-author. IL-6 blockade delays islet revascularization in a pig-to-NHP islet xenotransplantation model.</i>
2018	Jun-Seop Shin, Jong-Min Kim, Byoung-Hoon Min, Il Hee Yoon, Hyun Je Kim, Jung-Sik Kim, Yong-Hee Kim, Seong-Jun Kang , Jiyeon Kim, Hee-Jung Kang, Dong-Gyun Lim, Eung-Soo Hwang, Jongwon Ha, Sang-Joon Kim, Wan Beom Park, Chung-Gyu Park. "Pre-clinical results in pig-to-non-human primate islet xenotransplantation using anti-CD40 antibody (2C10R4)-based immunosuppression." <i>Xenotransplantation</i> . IF 3.9 <i>Co-author. Pre-clinical pig-to-NHP islet xenotransplantation with anti-CD40 (2C10R4)-based immunosuppression.</i>

2018 Jong-Min Kim, Jun-Seop Shin, Byoung-Hoon Min, Il Hee Yoon, **Seong-Jun Kang**, Won-Young Jeong, Sang-Joon Kim, Chung-Gyu Park. "Pre-Clinical Results of Islet Allo-Transplantation Using JAK Inhibitor as Replacement for Tacrolimus in Cynomolgus Monkeys." *Transplantation*. IF 6.2
Co-author. Pre-clinical islet allo-transplantation using a JAK inhibitor in place of tacrolimus in cynomolgus macaques.

2018 Jung-Sik Kim, Hyunwoo Chung, Nari Byun, **Seong-Jun Kang**, Sunho Lee, Jun-Seop Shin, Chung-Gyu Park. "Construction of EMSC-islet co-localizing composites for xenogeneic porcine islet transplantation." *Biochemical and Biophysical Research Communications*. IF 3.1
Co-author. Engineered EMSC-islet co-localizing composites for xenogeneic porcine islet transplantation.

MANUSCRIPTS IN PREPARATION

2026 Kangsan Roh*, Sabyasachi Das*, **Seong-Jun Kang**, Olga Barreiro, Rodrigo Javier Gonzalez, Timothy P. Padera, Shraddha Shirguppe, Ahlim Lee, Youngju Song, Pazhanichamy Kalailingam, Claire E. Fong, Aarushi Gandhi, Meehyun Kim, Diana Tambala, Adam Vernon Crain, Casey A. Maguire, Ulrich H. Von Andrian, Christian L. Lino Cardenas, Sekeun Kim, Benjamin P. Kleinstiver, Mark E. Lindsay, Patricia L. Musolino, Rajeev Malhotra. "In-vivo base editing of ACTA2 R179H restores lymphatic function and immune cell homeostasis in a murine model of Multisystemic Smooth Muscle Dysfunction Syndrome (MSMDS)." in preparation
Co-author (immunology). Performed the plasma proteomics analysis (Olink immune & neurology panels across the largest MSMDS patient cohort to date, n = 12 patients vs 6 controls), revealing broad down-regulation of lymphoid regulators (LTβR, BAFF) and leukocyte-adhesion molecules, with dimensionality reduction separating patients from controls; complemented by flow-cytometry immunophenotyping of lymph-node leukocytes (germinal-center B cells GL7+B220+) linking impaired lymphatic contractility to germinal-center loss and systemic immune dysregulation.

RESEARCH GRANTS & FUNDING

INDUSTRY · PB IMMUNE THERAPEUTICS (MANAGER – ASSOCIATE DIRECTOR)

FUNDING AGENCY / SPONSOR	PROJECT	PERIOD	BUDGET (USD)	ROLE / CONTRIBUTION
NAVER Corporation	Fundamental therapeutic strategy for immune-mediated diseases using engineered Tregs (PB20X_Treg)	2023–2026	~\$128,000	Proposal & study design (~50%)
Korea Drug Development Fund (KDDF)	Evaluation of drug efficacy and discovery of pharmacodynamic biomarkers of a new anti-CD40 antibody lead compound (PB101) for the treatment of pemphigus vulgaris	2022–2024	~\$321,000	Lead proposal writer (>90% of proposal & execution)
Ministry of SMEs and Startups (MSS)	Scale-up Funding for Tech Commercialization	2022–2023	~\$222,000	Lead proposal writer; managed >90% of execution
Korea Drug Development Fund (KDDF)	Lead selection and optimization of a therapeutic anti-CD40 antibody for the treatment of multiple sclerosis	2021–2023	~\$571,000	Lead proposal writer (>90% of proposal & execution)
Ministry of SMEs and Startups (MSS)	Early-stage startup R&D: anti-CD40 biologic (PB-40N) to prevent anti-drug antibodies	2021–2022	~\$74,000	Lead proposal writer & core researcher

DOCTORAL TRAINING · SEOUL NATIONAL UNIVERSITY

FUNDING AGENCY / SPONSOR	PROJECT	PERIOD	BUDGET (USD)	ROLE / CONTRIBUTION
Ministry of Science and ICT (MSIT) · Bio & Medical Technology Development Program	Establishing a meta-platform for discovering molecular targets by building a multi-layered immune-disease single-cell map (A9–22–1–05; SCAID, Single-cell Atlas for Immunological Disease)	2022–2028 (3+3)	~\$1.6M	Participated in proposal writing (>30%)
Ministry of Education (MOE) & Ministry of Science and	Laboratory-Specialized Tech-Transfer & R&BD Grant	2020–2021	~\$40,000	Grant writing, experimental design &

All grants were held by the institutional Principal Investigator (Ph.D. advisor at SNU; company CEO/CSO at PB Immune Therapeutics); the listed roles reflect the applicant's contribution to proposal writing and project execution, **not as PI**. Budgets converted at ≈ ₩1,400 / USD.

TECHNICAL SKILLS

Single-cell / spatial / multi-omic	scRNA-seq, scTCR-seq, snRNA/snATAC; Seurat, Scanpy, Squidpy, Monocle3, CellChat/NicheNet . Integration & generative models (as tools): scVI / scANVI , batch integration, consensus NMF , embedding geometry. Custom UMI-aware, BAM-level isoform analysis code (Python) ; two end-to-end analysis paths built from scratch. Graph/statistical methods: Milo KNN-graph DA, GLIPH , Shannon-entropy clonality, InferCNV, weighted-LMM/EMM. Spatial: GeoMx DSP (WTA + TCR). Proteomics: Olink targeted plasma proteomics (immune & neurology panels).
Machine learning / deep learning / AI	Python ML/DL: scikit-learn, XGBoost/LightGBM/CatBoost, PyTorch ; AUC-validated classifiers; VAE/GAN/GNN exposure. Multimodal DL integration (imaging + transcriptomic + clinical); vision-language transformers. AlphaFold2/3, ProteinMPNN, DiffDock; MolFormer. Linux servers · R/RStudio · Git-based reproducible analysis.
Experimental (domain ground truth)	10× 5'/3' scRNA-seq + scTCR-seq library generation; cell/nucleus isolation. High-dimensional flow cytometry (up to 24 markers); multiplex panel design; 10-color 6-way FACS. Brain/CNS immune profiling (perfusion, digestion, Percoll, CD45+ FACS); IHC/IF (frozen & FFPE); two-photon microscopy. NHP CNS tissue (rhesus, cynomolgus, marmoset); EAE/MS & islet-transplant disease models.

RESEARCH INTERESTS

- **Reading immune cell state from incomplete single-cell data.** Cell-state calling under ambiguity, isoform and transcript resolution from short reads, and embedding representations of cells, with calibrated confidence.
- **Multi-modal integration of molecular identity.** Transcriptome, chromatin, spatial, and proteome into cell-state-resolved models.
- **Neuro-immune interactions in neurodegeneration.** T cells, microglia, and the blood-CSF barrier in Alzheimer's and related disease; ligand-receptor cross-talk and clonal/repertoire structure.
- **Building and checking computational analysis paths.** Custom callers, reproducible end-to-end analysis code, and comparison against domain ground truth.
- **Atlas-scale single-cell analysis across diseases and species.** Large multi-donor atlases (SCAID), cross-disease meta-analysis, and NHP-to-human translation.

AWARDS, PATENTS & SCHOLARSHIPS

PATENTS

2024	Antagonistic Anti-CD40 Humanized Antibody. Patent No. 1020240085972 (registered 2024-07-01).
2019	Immunosuppression Composition Comprising JAK Inhibitor. Patent No. 1020143490000 (registered 2019-08-20).

AWARDS

2024	Grand Prize , 2024 GPTers AI Hackathon (Project GAIA Team)
2023	Grand Prize , SBA Smart Workathon (Work Process Innovation)
2017	Best Poster Award , American Transplant Congress, Chicago · Best Presentation Award , Korean Association of Immunologists

2014–2020 NRF Research Scholarship for Ph.D. Candidates · Dean's Lecture & Research Support Scholarship, SNU College of Medicine · BK21 Plus Research Scholarship

■ SELECTED PRESENTATIONS

Poster KAI Annual Meeting, Incheon (2022) · Cytokine, Hawaii (2022) · American Transplant Congress, Chicago (2017) · The Transplantation Society, Hong Kong (2016) · IPITA/IXA/CTS, Melbourne (2015) · TREG, Shanghai (2012)

■ REFERENCES

Chung-Gyu Park, M.D., Ph.D.

Professor, Microbiology & Immunology / Biomedical Sciences,
SNU College of Medicine; CEO/CSO, PB Immune Therapeutics
· chgpark@snu.ac.kr
Ph.D. advisor.

Seung-Kuy Cha, Ph.D.

Professor, Dept. of Physiology & Global Medical Science,
Yonsei University Wonju College of Medicine ·
skcha@yonsei.ac.kr
Most recent research supervisor (2025–2026).

Hyun Je Kim, M.D., Ph.D.

Assistant Professor, Microbiology & Immunology / Biomedical
Sciences; Interdisciplinary Program in Artificial Intelligence
(IPAI), SNU · tte9801@snu.ac.kr
*Co-corresponding on PDE4D & mfAD studies, computational /
single-cell.*

Jeong Seok Lee, M.D., Ph.D.

Associate Professor, Graduate School of Medical Science &
Engineering, KAIST, Daejeon · chemami@kaist.ac.kr
Corresponding author, PDE4D / Nature Immunology study.