

Curriculum Vitae



Young-Gyun Park, Ph. D.

Assistant Professor

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PROFESSIONAL SUMMARY

I develop bioimaging techniques to unveil invisible layers of the brain network, specifically for its three-dimensional landscape. Using these, I map the brain in a novel way and, based on this, I do system neuroscience research aiming to reveal how brain functions and dysfunctions arise from the synapse network between neurons. Using these novel imaging, I uncovered a new network, a wireless interneuronal network mediated by extracellular vesicles (EV).

EDUCATION

Integrated M.S./Ph.D. , Biological Sciences, KAIST, South Korea	2006-2011
- Thesis: Role of T-type calcium channel on tremorogenesis	
B.S. , Biological Sciences, KAIST, South Korea	2002-2006

PROFESSIONAL EXPERIENCE

Research Scientist , MIT, United States (Advisor: Dr. Kwanghun Chung)	! 2019-2020
Postdoctoral Fellow , MIT, United States (Advisor: Dr. Kwanghun Chung)	! 2015-2019
Postdoctoral Associate , Friedrich-Miescher Institute, Switzerland (Advisor: Dr. Silvia Arber)	! 2013-2015
Postdoctoral Associate , KAIST, Korea (Advisor: Dr. Daesoo Kim)	! 2011-2013

APPOINTMENTS

Assistant Professor , Department of Bio and Brain Engineering, KAIST, South Korea	! 2020-present
Adjunct Professor , Department of Biological Sciences, KAIST, South Korea	! 2020-present
Assistant Professor , Program of Brain and Cognitive Engineering, KAIST, South Korea	! 2020-present

AWARDS AND HONORS

KAIST Grand Prize for Creative Education, KAIST (KAIST 창의강의대상, KAIST)	2024
KAIST Global Excellence Lab, KAIST (KAIST 글로벌 우수연구실, KAIST)	2023

Excellence Prize, The Soo-Young Lee Teaching Innovation Award, KAIST (이수영 교수학습혁신상, KAIST)	2023
Grand Prize, The 2 nd University Distance Education Best Case Contest, Korea Education and Research Information Service (제 2 회 대학 원격교육 우수사례 공모전 최우수상 (교육부장관상), 한국교육학술정보원)	2022
Poster Award, New England Bioscience Society (포스터상, 뉴잉글랜드 생명과학회)	2019
AkN Post-doctoral Award, Association of Korean Neuroscientists (박사후연구원상, 재미한인신경과학자협회)	2018
Excellent Oral Presentation, Department of Biological Sciences, KAIST (우수 구두발표상, KAIST 생명과학과)	2012
Best Oral Presentation, Korea Society of Biochemistry and Molecular Biology (KSBMB) (최우수 구두발표상, 한국생화학분자생물학회)	2010
Bo-Jung Kim Scholarship (김보정 장학금)	2006

PUBLICATIONS (*First author; †Corresponding author)

Preprints

- 1) Kim S*, Park H*, Cho W, Yoo S, Charoenpattarawut T, Pearson C, **Park Y-G**†. (2026) Whole-brain protein profiling using organ-scale multiplexed immunolabeling and image co-registration. *bioRxiv*. doi.org/10.64898/2026.05.06.723275 [link](#) [PDF](#)
- 2) Kim D*, **Park Y-G**†. (2026) 3DBrainOne: an integrated end-to-end platform for 3D histological analysis of whole mouse brains. *bioRxiv*. doi.org/10.64898/2026.05.06.723327 [link](#) [PDF](#)
- 3) Swaney J*, Kamensky L, Evans N, Xie K, **Park Y-G**, Drummond G, Yun DH, Chung K† (2019) Scalable image processing techniques for quantitative analysis of volumetric biological images from light-sheet microscopy. *bioRxiv*, 576595 [link](#) [PDF](#)

Journal Publications

- 1) Apsari R*, S Lee*, Maizel E, Park H, Jeong H, Lee N, **Park Y-G**†, Prefrontal responses to negative emotional movements in healthy and symptomatic individuals, *Brain Research Bulletin (IF=4.5)*, in press. [link](#) [PDF](#)
- 2) Yoon C*, Lee Y, Yim G, Lee S-W, Lee W, **Park Y-G**, Park S†, Nongenetic in Vivo Bimodal Neuromodulation via Photothermal Gold Nanorods and a Multifunctional Fiber Neural Probe. *ACS Nano (IF=17.3)* [link](#) [PDF](#)
- 3) Gall-Duncan T*, Ko SYY*, Quick IK*, Feng K, Khan M, Kelley CP, Coleman A, Touze A, Tang S, **Yoo S**, Mehkary M, Yokoi K, Herrington CR, You J, Lambie SC, Prasolava TK, Panigrahi GB, **Kim D**, Park J, Byrne LM, Wang P, Schneekloth JS Jr., **Park Y-G**, Frankland PW, Wang ET, Pearson CE†. Interventionally contracting CAG expansions using a slipped-DNA binding small-molecule is a rapid Huntington disease-modifying therapeutic avenue. (*Accepted to Nature Genetics; IF=25.5*)
- 4) Song J*, Lee W, Nam H, **Park H**, **Park Y-G**, Yoo H†. Single-objective two-photon oblique light sheet microscopy with a low repetition rate for 3D high-SNR imaging. *Photonics Research (IF=7.1)* [link](#) [PDF](#)

- 5) Sung C*, Nam K.S., Kim Y, Kang H, Kim K, Yoon C, Lee S, Chung A, Kang J, **Park Y-G**, Park A.J., Butt H, Yuk H, Park S†. (2025) Thermally Drawn Multifunctional All-Hydrogel Fibers for Anti-Fibrotic and Multimodal Neural Interfaces. **Advanced Materials (IF=26.8)** [link](#) [PDF](#)
- 6) Kim J*, Kim S*, Jung W*, Kim Y, Lee S, Kim S, Park H-Y, Yoo DY, Hwang IK, Froemke RC, Lee S-H, **Park Y-G**, Schwartz GJ, Suh GSB†. (2025) Encoding the glucose identity by discrete hypothalamic neurons via the gut-brain axis. **Neuron (IF=14.7)** [link](#) [PDF](#)
- 7) Yun DH*, **Park Y-G***, Cho JH, Kamensky L, Evans N, DiNapoli N, Xie K, Choi SW, Albanese A, Tian Y, Sohn CH, Zhang Q, Kim M, Swaney J, Guan W, Park J, Drummond G, Choi H, Ruelas L, Feng G, Chung K†. (2025) Uniform volumetric single-cell processing for organ-scale molecular phenotyping. **Nature Biotechnology (IF=41.7)** [link](#) [PDF](#)
- 8) Kim H*, Kim B, Kim SJ, Choi Y, Kim I-H-R, Han J, **Park Y-G**, Han Y-M, Park J-K† (2024) Reconfigurable Hanging Drop Microarray Platform for On-Demand Preparation and Analysis of Spheroid Array. **Advanced Healthcare Materials (IF=10.0)**. 13:22. [link](#) [PDF](#)
- 9) Cho W*, Kim S*, **Park Y-G**†. (2023) Towards multiplexed immunofluorescence of 3D tissues. **Mol. Brain (IF=3.3)** 16:37. [link](#) [PDF](#)
- 10) Min KW*, Kim N, Lee JH, Sung Y, Kim M, Lee EJ, Kim J-M, Kim J-H, Lee J, Cho W, Yang JM, Kim N, Kim J, Lee CJ, **Park Y-G**, Lee S-H, Lee H-W, Kim JW†. (2023) Visuomotor anomalies in achiasmatic mice expressing a transfer-defective Vax1 mutant. **Exp. Mol. Medicine (IF=9.5)** 55:385–400. [link](#) [PDF](#)
- 11) Jeon J*, Kim H, Jang H, Hwang K, Kim K, **Park Y-G**, Jeong K-H†. (2022) Handheld laser scanning microscope catheter for real-time and in vivo confocal microscopy using a high definition high frame rate Lissajous MEMS mirror. **Biomed. Opt. Express (IF=2.9)** 13:1497–1505. [link](#) [PDF](#)
- 12) Roy DS*, **Park Y-G***, Kim ME*, Zhang Y*, Ogawa SK*, DiNapoli N, Gu X, Cho JH, Choi H, Kamensky L, Martin J, Mosto O, Aida T, Chung K†, Tonegawa S†. (2022) Brain-wide mapping reveals that engrams for a single memory are distributed across multiple brain regions. **Nature Communications (IF=14.7)** 13:1799. [link](#) [PDF](#)
- 13) Lilascharoen V*, Wang EH*, Nam D, Pate SC, Tran AN, Yoon CD, Choi J-H, Wang X-Y, Pribiag H, **Park Y-G**, Chung K, Lim BK† (2021) Divergent pallidal pathways underlying distinct Parkinsonian behavioral deficits, **Nature Neuroscience (IF=21.3)**, 24 504-515 [link](#) [PDF](#)
- 14) Muñoz-Castañeda R*, Zingg B*, Matho KS*, Chen X*, Wang Q*, Foster NN, Li A, Narasimhan A, Hirokawa KE, Huo B, Bannerjee S, Korobkova L, Park CS, **Park Y-G**, Bienkowski MS, Chon U, Wheeler DW, Li Xiangning, Wang Yun, Naeemi M, Xie P, Liu L, Kelly K, An X, Attili SM, Bowman I, Bludova A, Cetin A, Ding L, Drewes R, D'Orazi F, Elowsky C, Fischer S, Galbavy W, Gao L, Gillis J, Groblewski PA, Gou L, Hahn JD, Hatfield JT, Hintiryan H, Huang JJ, Kondo H, Kuang X, Lesnar P, Li Xu, Li Y, Lin M, Lo D, Mizrachi J, Mok S, Nicovich PR, Palaniswamy R, Palmer J, Qi X, Shen E, Sun Y-C, Tao HW, Wakemen W, Wang Yimin, Yao S, Yuan J, Zhan H, Zhu M, Ng L, Zhang LI, Lim BK, Hawrylycz M, Gong H, Gee JC, Kim Y, Chung K, Yang XW, Peng H, Luo Q, Mitra PP, Zador AM, Zeng H, Ascoli GA†, Huang ZJ†, Osten P†, Harris JA†, Dong H-W†. (2021) Cellular anatomy of the mouse primary motor cortex. **Nature (IF=50.5)** 598:159–166. [link](#) [PDF](#)
- 15) **Park Y-G***, Sohn CH*, Chen R*, McCue M, Yun DH, Drummond GT, Ku T, Evans NB, Oak HC, Trieu W, Choi H, Jin X, Lilascharoen V, Wang J, Truttmann MC, Qi HW, Ploegh HL, Golub TR, Chen S-C, Frosch MP, Kulik HJ, Lim BK, Chung K† (2019) Protection of tissue physicochemical properties using polyfunctional crosslinkers. **Nature Biotechnology (IF=33.1)**, 37(1), pp 73–83 (Cover article) [link](#) [PDF](#)
- 16) Ku T*, Swaney J*, Park J-Y*, Albanese A, Murray E, Cho JH, **Park Y-G**, Mangena V, Chen J, Chung K† (2016) Multiplexed and scalable super-resolution imaging of three-dimensional protein localization in size-adjustable tissues. **Nature Biotechnology (IF=33.1)**, 34(9), pp 973–981 [link](#) [PDF](#)
- 17) Murray E*, Cho JH*, Goodwin D*, Ku T*, Swaney J, Kim S-Y, Choi H, **Park Y-G**, Park J-Y, Hubbert A, McCue M, Vassallo S, Bakh N, Frosch MP, Wedeen VJ, Seung HS, Chung K† (2015) Simple, scalable

proteomic imaging for high-dimensional profiling of intact systems. *Cell* (**IF=66.9**), 163(6), pp 1500–1514 [link](#) [PDF](#)

- 18) Lee E*, Hong J*, **Park Y-G**, Chae S, Kim Y, Kim D† (2015) Left brain cortical activity modulates stress effects on social behavior. *Scientific Reports* (**IF=3.8**), 5(1), p 13342 [link](#) [PDF](#)
- 19) **Park Y-G***, Choi JH, Lee C, Kim S, Kim Y, Chang K-Y, Paek SH, Kim D† (2015) Heterogeneity of tremor mechanisms assessed by tremor-related cortical potential in mice. *Molecular Brain* (**IF=3.3**) 8(1), p 3 [link](#) [PDF](#)
- 20) **Park Y-G***, Kim J, Kim D (2013) The potential roles of T-type Ca²⁺ channels in motor coordination. *Frontiers in Neural Circuits* (**IF=3.4**), 7 [link](#) [PDF](#)
- 21) Chang K-Y*, **Park Y-G**, Park H-Y, Homanics GE, Kim J, Kim D† (2011) Lack of CaV3.1 channels causes severe motor coordination defects and an age-dependent cerebellar atrophy in a genetic model of essential tremor. *Biochemical and Biophysical Research Communications* (**IF=2.5**), 410(1), pp 19–23 [link](#) [PDF](#)
- 22) Kim J*, Woo J, **Park Y-G**, Chae S, Jo S, Choi JW, Jun HY, Yeom YI, Park SH, Kim KH, Shin H-S, Kim D† (2011) Thalamic T-type Ca²⁺ channels mediate frontal lobe dysfunctions caused by a hypoxia-like damage in the prefrontal cortex. *The Journal of Neuroscience* (**IF=4.4**), 31(11), pp 4063–4073 [link](#) [PDF](#)
- 23) **Park Y-G***, Park H-Y*, Lee CJ, Choi S, Jo S, Choi H, Kim Y-H, Shin H-S, Llinas RR, Kim D† (2010) CaV3.1 is a tremor rhythm pacemaker in the inferior olive. *Proceedings of the National Academy of Sciences* (**IF=9.4**), 107(23), pp 10731–10736 [link](#) [PDF](#)

PATENTS

- 1) Method and Apparatus for Nonlinear Cell-level Co-registration of Three-dimensional tissue Images using Landmark-based and Contrastive Learning (2026) Korean patent 10-2026-0001801 (filed)
- 2) Multiplexable High-quality 3D Tissue Immunohistochemistry (2026) Korean patent 10-2026-0007323 (filed)
- 3) Device and Method for Measuring Individual Mouse Vocalization Using Accelerometer (2025) Korean patent 10-2025-0056155 (filed)
- 4) Method for Discovering Key Protein for Cell-selective Drug Delivery Through Analysis of in vivo-derived Extracellular Endoplasmic Reticulum Delivery (2023) Korean patent 10-2023-0046963 (filed)
- 5) Double knockout GABAA $\alpha 1^{-/-}$; CaV3.1 and GABAA $\alpha 1^{-/-}$; Emx1-cre mouse models with enhanced essential tremor. (2013) European Patent EP2241628A1 (registered)
- 6) Method for the prevention and treatment of Essential tremor by regulating $\alpha 1g$ T-type calcium channel or by T-type calcium channel blockers. (2012) U.S. Patent US20120014880A1 (applied)
- 7) Mouse models with enhanced Essential tremor and preparation method thereof. (2012) U.S. Patent US8319007B2 (registered)
- 8) Mouse models enhanced in Essential tremor and method for producing the same. (2012) Japan Patent 05079839 (registered)
- 9) $\alpha 1$ /CaV3.1 double knockout mice exhibiting essential tremor and preparation method thereof. (2011) Korean patent 1010925780000 (registered)

TEACHING

Lecturer, Brain Science Fundamentals, KAIST (2025-present)
 Lecturer, Brain and Cognitive Engineering II, KAIST (2023-present)
 Lecturer, Brain and Cognitive Engineering I, KAIST (2021-present)
 Lecturer, Biotechnology Laboratory, KAIST (2021-present)
 Lecturer, Methods in Neuroscience, KAIST (2021-present)

Lecturer, Freshmen Seminar <Bio and Brain Engineering>, KAIST (2021)
 Lecturer, Brain and Cognitive Engineering I, KAIST (2021-2022)
 Lecturer, Special lectures in Bio and Brain Engineering <Single-cell brain mapping>, KAIST (2020)
 Instructor, MISTI global seed funds program, MIT (2018)
 Supervisor, Undergraduate Research Program, KAIST (2010 - 2012)
 Mentor, Group Supervision Program, KAIST (2010)

SERVICE

Professional Service (Societies and External)

- Board Member, Korean Society for Extracellular Vesicles (2023–present)
 한국엑소좀학회 이사 (2023–현재)
- Secretary, General Affairs Committee, Korean Society for Extracellular Vesicles (2023–2025)
 한국세포외소포학회 총무위원회 간사 (2023–2025)
- Academic Committee Member, Brain Engineering Division, Korean Society of Medical and Biological Engineering (2021–present)
 대한의용생체공학회 뇌공학분과 학술위원 (2021–현재)
- Academic Committee Member, BioMEMS Division, Korean BioChip Society (2021–present)
 한국바이오칩학회 바이오멤스분과 학술위원 (2021–현재)
- Organizing Lead in KAIST, Brain Awareness Week symposium (2025–present)
 세계 뇌주간 심포지엄 조직 카이스트 총괄 (2025–현재)
- Organizer, 1st KAIST–Mahidol Workshop in Biomedical Engineering (2022)
 제 1 회 KAIST–Mahidol 의생명공학 워크샵 조직위원 (2022)
- Organizer and Speaker, Harvard–MIT–KAIST Joint Symposium (2020)
 Harvard–MIT–KAIST 공동 심포지엄 조직위원 및 연사 (2020)