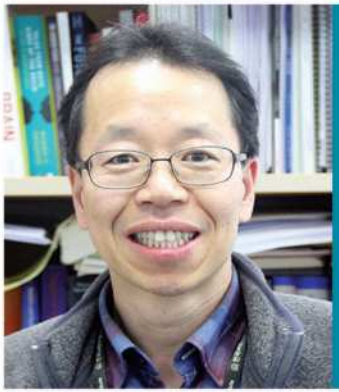

Youngshik Choe, PhD

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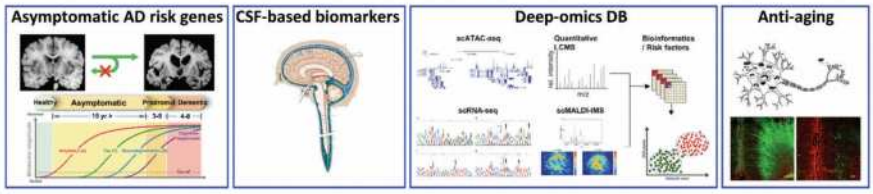
Single cell omics & brain disease

I have scientific experiences covering molecular biology, mass spectrometry, mouse genetics, stem cells and have a life-long question about how we store and retrieve data in the brain. Researches asking this question will lead us to a cure for brain diseases including Alzheimer's disease and circuitopathies such as depression and autism. To pursue this scientific endeavor, collaboration of open minded scientists and adoption of novel tools are critical. Working together with professionals in the field of mouse genetics, omics, informatics and neuroengineering, I believe it will be cleared how brain cells utilize electric current to decode memories written in molecular languages.

Aim	Characterization of risk factors for brain diseases including brain aging with deep-omics integration
Tool	scRNA-seq, scMALDI-IMS, EV proteomics, 3D IHC, human brain organoids
TARGET	

Research keywords

Multi-omics, Exosome, 3D brain mapping, Molecular connectome, Single cell platform, Closed-loop neural probe, Organoid, Big data analysis.

Curriculum Vitae

2013~Present : Principal Investigator, KBRI
2008~2013 : Specialist, Neuroscience, UCSF, USA
2003~2008 : Postdoctoral Fellow, Neuroscience, UCSF, USA

Academic Credential

2001 : Ph.D., Molecular Biology, SNU
1996 : M.S., Molecular Biology, SNU
1994 : B.S., Molecular Biology, SNU

Awards/Honors/Memberships

2019~Present : Committee, The Genetics Society of Korea
2014~Present : Member, Society for Neuroscience

Key techniques

Proteomics, Lipidomics, MALDI-imaging, Cohort precision omics, Exosome omics, CLARITY, 3D IHC, Single cell omics, Single cell RNA seq, Neural recording (probe, 2p), Big data informatics pipeline (R, Python), Behavioral analysis, Neural circuit analysis.

Research Interests/Topics

- Multi-omics analysis of brain organoids: scRNA-seq, lipidomics, proteomics.
- Extracellular vesicle biomarkers of Korean AD cohort.
- scRNA-seq biomarkers of brain aging.

Research Publications (selected)

- **Choe Y,** Pleasure SJ. Meningeal Bmps regulate cortical layer formation. *Brain Plasticity, 26:169-183, 2018.*
- Mishra S, **Choe Y**, Pleasure SJ, Siegenthaler JA. Cerebrovascular defects in Foxc1 mutants correlate with aberrant WNT and VEGF-A pathways downstream of retinoic acid from the meninges. *Dev Biol, 420:148-165, 2016.*
- **Choe Y**, Pleasure SJ, Mira H. Control of Adult Neurogenesis by Short-Range Morphogenic-Signaling Molecules. *Cold Spring Harb Perspect Biol, doi:10.1101/cshperspect.a018887, 2015.*
- **Choe Y**, Huynh T, Pleasure SJ. Epithelial cells supply Sonic Hedgehog to the perinatal dentate gyrus via transport by platelets. *Elife, 10.7554/eLife.07834, 2015.*

Patents

10-2017-0086725, 10-2017-0118125, 10-2017-0135948, 10-2017-0168844, 10-2018-0004121, 10-2018-0054511, PCT/KR2018/012369.

Technology transfer

10-2017-0135948, 10-2018-0004121. (Logos Biosystems, DeepLabelTM)