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APPOINTMENT

University of Seoul — Seoul, South Korea
Department of Life Science — 2023.03 – *Present*
Assistant Professor

EDUCATION

Massachusetts Institute of Technology (MIT) — Cambridge, MA, USA
Ph.D., Biological Chemistry — 2009.08 – 2016.06

Pohang University of Science and Technology (POSTECH) — Pohang, South Korea
B.S., Chemistry with a minor in Life Science — 2004.03 – 2008.02
Summa Cum Laude

RESEARCH EXPERIENCE

Korea Institute of Science and Technology (KIST) — Seoul, South Korea
Brain Science Institute — 2016.07 – 2023.02
Postdoctoral Fellow

[Alternative military service as research personnel: 2016.07 – 2019.08]

Massachusetts Institute of Technology (MIT) — Cambridge, MA, USA
The Picower Institute for Learning and Memory — 2010.07 – 2016.06
Research Assistant, Graduate Student

Marine Biological Laboratory (MBL) — Woods Hole, MA, USA
Neurobiology Course — 2011.06 – 2011.07

University of California, Los Angeles (UCLA) — Los Angeles, CA, USA
Departments of Psychiatry and Biological Chemistry — 2008.07 – 2009.01
Research Assistant

PUBLICATIONS

First and co-first authored papers

1. Seo J*, **Hwang H***, Sohn H*, Cho E, Jung S, Kim S, Um SM, Kim JY, Kang M, Choi Y, Kim JH, Kim M, Kim SY, Lee SK, Ahnn J, Rhim H, Jo DG, Kim E, Park M (2023) Cyclin Y regulates spatial learning and memory flexibility through distinct control of the actin pathway. ***Mol. Psychiatry***, 28(3), 1351

2. Seo J*, **Hwang H***, Choi Y*, Jung S, Hong JH, Yoon BJ, Rhim H, Park M (2022) Myristoylation-dependent palmitoylation of cyclin Y modulates long-term potentiation and spatial learning. ***Prog. Neurobiol.***, 218, 102349

3. **Hwang H***, Hur YN*, Sohn H, Seo J, Hong JH, Cho E, Choi Y, Lee S, Song S, Lee AR, Kim S, Jo DG, Rhim H, Park M (2021) Cyclin Y, a novel actin-binding protein, regulates spine plasticity through the cofilin-actin pathway. ***Prog. Neurobiol.***, 198, 101915

4. **Hwang H**, Szucs MJ, Ding LJ, Allen A, Ren X, Haensgen H, Gao F, Rhim H, Andrade A, Pan JQ, Carr SA, Ahmad R, Xu W (2021) Neurogranin, encoded by the schizophrenia risk gene *NRGN*, bidirectionally modulates synaptic plasticity via calmodulin-dependent regulation of the neuronal phosphoproteome. ***Biol. Psychiatry***, 89(3), 256 (**co-corresponding author**)

5. **Hwang H***, Seo J*, Choi Y*, Cho E, Sohn H, Jang J, Lee AR, Lee J, Kim S, Koh HY, Park M (2020) *Ccny* knockout mice display an enhanced susceptibility to kainic acid-induced epilepsy. ***Pharmacol. Res.***, 160, 105100

6. Ryoo N*, Rahman MA*, **Hwang H***, Ko SK, Nah SY, Kim HC, Rhim H (2020) Ginsenoside Rk1 is a novel inhibitor of NMDA receptors in cultured rat hippocampal neurons. ***J. Ginseng Res.***, 44(3), 490

7. Cho Y*, **Hwang H***, Rahman MA, Chung C, Rhim H (2020) Elevated O-GlcNAcylation induces an antidepressant-like phenotype and decreased inhibitory transmission in medical prefrontal cortex. ***Sci. Rep.***, 10(1), 6924

8. **Hwang H**, Rhim H (2019) Acutely elevated O-GlcNAcylation suppresses hippocampal activity by modulating both intrinsic and synaptic excitability factors. ***Sci. Rep.***, 9(1), 7287

9. Nam SM*, **Hwang H***, Seo M, Chang BJ, Kim HJ, Choi SH, Rhim H, Kim HC, Cho IH, Nah SY (2018) Gintonin attenuates D-Galactose-induced hippocampal senescence by improving long-term hippocampal potentiation, neurogenesis, and cognitive functions. ***Gerontology***, 64(6), 562

10. **Hwang H**, Rhim H (2018) Functional significance of O-GlcNAc modification in regulating neuronal properties. ***Pharmacol. Res.***, 129, 295

Co-authored papers

1. Lee R, Kim JH, **Hwang H**, Rhim H, Hwang SH, Cho IH, Kim DG, Kim HC, Nah SY (2023) Preparation of red ginseng marc-derived gintonin and its application as a skin nutrient. ***Nutrients***, 15(11), 2574

2. Rahman MA, Rahman MDH, Mamun-Or-Rashid ANM, **Hwang H**, Chung S, Kim B, Rhim H (2022) Autophagy modulation in aggresome formation: Emerging implications and treatments of Alzheimer's disease. ***Biomedicines***, 10(5), 1027

3. Choi SH, Lee RM, Cho HS, Hwang SH, **Hwang H**, Rhim H, Kim HC, Kim DG, Cho IH, Nah SY (2022) Visualization of the binding between gintonin, a Panax ginseng-derived LPA receptor ligand, and the LPA receptor subtypes and transactivation of the EGF receptor. ***J. Ginseng Res.***, 46(3), 348

4. Kim D, Lee Y, Kim HR, Park YJ, **Hwang H**, Rhim H, Kang T, Choi CW, Lee B, Kim MS (2021) Hypothalamic administration of sargahydroquinoic acid elevates peripheral thermogenic signaling and ameliorates high fat diet-induced obesity through the sympathetic nervous system. ***Sci. Rep.***, 11(1), 21315

5. Lee R, Choi SH, Cho HS, **Hwang H**, Rhim H, Kim HC, Hwang SH, Nah SY (2021) Effect of the gintonin-enriched fraction on glucagon-like-protein-1 release. ***Molecules***, 26(20), 6298

6. Oh SY, Jang MJ, Choi YH, **Hwang H**, Rhim H, Lee B, Choi CW, Kim MS (2021) Central administration of afzelin extracted from Ribes fasciculatum improves cognitive and memory function in a mouse model of dementia. ***Sci. Rep.***, 11(1), 9182

7. Rahman MA, Rahman MS, Rahman MH, Rasheduzzaman M, Mamun-Or-Rashid A, Uddin MJ, Rahman MR, **Hwang H**, Pang MG, Rhim H (2021) Modulatory effects of autophagy on APP processing as a potential treatment target for Alzheimer's disease. ***Biomedicines***, 9(1), 5

8. Rahman MA, Cho Y, **Hwang H**, Rhim H (2020) Pharmacological inhibition of O-GlcNAc transferase promotes mTOR-dependent autophagy in rat cortical neurons. ***Brain Sci.***, 10(12), 958

9. Rahman MA, **Hwang H**, Nah SY, Rhim H (2020) Gintonin stimulates autophagic flux in primary cortical astrocytes. ***J. Ginseng Res.***, 44(1), 67

10. Cho YJ, Choi SH, Lee R, **Hwang H**, Rhim H, Cho IH, Kim HC, Lee JI, Hwang SH, Nah SY (2020) Ginseng gintonin contains ligands for GPR40 and GPR55. ***Molecules***, 25(5), 1102

11. Lee NE, Park SD, **Hwang H**, Choi SH, Lee RM, Nam SM, Rhim H, Cho IH, Kim HC, Hwang SH, Nah SY (2020) Effect of a gintonin-enriched fraction on hair growth: an *in vitro* and *in vivo* study. ***J. Ginseng Res.***, 44(1), 168

12. Rahman MA, **Hwang H**, Cho Y, Rhim H (2019) Modulation of O-GlcNAcylation regulates autophagy in cortical astrocytes. ***Oxid. Med. Cell. Longev.***, 6279313

13. Lee R, Lee NE, **Hwang H**, Rhim H, Cho IH, Nah SY (2019) Ginseng gintonin enhances hyaluronic acid and collagen release from human dermal fibroblasts through lysophosphatidic acid receptor interaction. ***Molecules***, 24(24), 4438

14. Kim HY, Yang YR, **Hwang H**, Lee HE, Jang HJ, Kim J, Yang E, Kim H, Rhim H, Suh PG, Kim JI (2019) Deletion of PLCγ1 in GABAergic neurons increases seizure susceptibility in aged mice. ***Sci. Rep.***, 9(1), 17761

15. Kim SH, Seo M, **Hwang H**, Moon DM, Son GH, Kim K, Rhim H (2019) Physical and functional interaction between 5-HT_6 receptor and Nova-1. ***Exp. Neurobiol.***, 28(1), 17

16. Choi SH, Kim HJ, Cho HJ, Park SD, Lee NE, Hwang SH, Cho IH, **Hwang H**, Rhim H, Kim HC, Nah SY (2019) Gintonin, a ginseng-derived exogenous lysophosphatidic acid receptor ligand, protects astrocytes from hypoxic and re-oxygenation stresses through stimulation of astrocytic glycogenolysis. ***Mol. Neurobiol.***, 56(5), 3280

17. Jo MG, Ikram M, Jo MH, Yoo L, Chung KC, Nah SY, **Hwang H**, Rhim H, Kim MO (2019) Gintonin mitigates MPTP-induced loss of nigrostriatal dopaminergic neurons and accumulation of α-synuclein via the Nrf2/HO-1 pathway. ***Mol. Neurobiol.***, 56(1), 39

18. Liu M, Shi R, **Hwang H**, Han KS, Wong MH, Ren X, Lewis LD, Brown EN, Xu W (2018) SAP102 regulates synaptic AMPAR function through a CNIH-2-dependent mechanism. ***J. Neurophysiol.***, 120(4), 1578

19. Jones KJ, Templet S, Zemoura K, Kuzniewska B, Pena FX, **Hwang H**, Lei DJ, Haensgen H, Nguyen S, Saenz C, Lewis M, Dziembowska M, Xu W (2018) Rapid, experience-dependent translation of neurogranin enables memory encoding. ***Proc. Natl. Acad. Sci. USA.***, 115(25), E5805

20. Shi R, Redman P, Ghose D, **Hwang H**, Liu Y, Ren X, Ding LJ, Liu M, Jones KJ, Xu W (2017) Shank proteins differentially regulate synaptic transmission. ***eNeuro***, 4(6), 0163-15.2017

21. Yang YR, Song S, **Hwang H**, Jung JH, Kim SJ, Yoon S, Hur JH, Park JI, Lee C, Nam D, Seo YK, Kim JH, Rhim H, Suh PG (2017) Memory and synaptic plasticity are impaired by dysregulated hippocampal O-GlcNAcylation. ***Sci. Rep.***, 7, 44921

22. Gao M, Sossa K, Song L, Errington L, Cummings L, **Hwang H**, Kuhl D, Worley P, Lee HK (2010) A specific requirement of Arc/Arg3.1 for visual experience-induced homeostatic synaptic plasticity in mouse primary visual cortex. ***J. Neurosci.***, 30(21), 7168

23. Wang DO, Kim SM, Zhao Y, **Hwang H**, Miura SK, Sossin WS, Martin KC (2009) Synapse- and stimulus-specific local translation during long-term neuronal plasticity. ***Science***, 324(5934), 1536

Manuscripts in progress

1. **Hwang H***, Song JY*, Rhim H, Yang BS (202X) Topical application of LCB03-0110, a multi-kinase inhibitor, exhibits direct and fast-acting anti-pruritic activity and ameliorates atopic dermatitis-like inflammatory conditions in mice. (*in preparation*)

2. Cho Y, **Hwang H**, Rhim H (202X) Transcriptome analysis of O-GlcNAcase-mediated changes in hippocampal neurons. (**co-corresponding author**) (*in preparation*)

PATENTS

Rhim H, Nah SY, **Hwang H** (2018) Pharmaceutical composition comprising gintonin for prevention and treatment of Parkinson's disease. *Korean patent pending*, No. 10-2018-0075055

HONORS AND AWARDS

Best Presentation Award 2021.05
Korean Society for Brain and Neural Sciences (KSBNS)

Excellent Poster Award 2020.12
Brain Science Institute, KIST

Best Presentation Award 2020.11
Korean Society for Brain and Neural Sciences (KSBNS)

Korea Foundation for Advanced Studies Fellowship 2009 – 2014
Korea Foundation for Advanced Studies (KFAS)

Henry E. Singleton (1940) Graduate Fellowship 2010 – 2012
The Picower Institute for Learning and Memory, MIT

Arthur Klorfein Scholarship 2011.05
Marine Biological Laboratory (MBL)

***Summa Cum Laude* Honor Student Award** 2008.02
POSTECH

Presidential Science Scholarship 2004 – 2008
The President of the Republic of Korea
Full-tuition scholarship for undergraduate studies

Lee In-Sook Scholarship 2005 – 2007
Department of Chemistry, POSTECH

GRANTS (received as a principal investigator)

Sejong Science Fellowship (NRF-2021R1C1C2009072) 2021.03 – *Present*
National Research Foundation of Korea

Role: Principal investigator (PI)
Funding amount: 122,110,000 KRW per year (Total: 610,550,000 KRW)
Duration: 5 years (2021.03 – 2026.02)

TEACHING EXPERIENCE

Undergraduate Research Opportunities Program (UROP) 2013.09 – 2016.06
The Picower Institute for Learning and Memory, MIT
Research mentor for undergraduate students (Weifeng Xu Lab)

Laboratory Chemistry (CHEM 5.310) Spring 2010
Department of Chemistry, MIT
Teaching Assistant (Instructor: Dr. John J. Dolhun)

Principles of Chemical Science (CHEM 5.111) Fall 2009
Department of Chemistry, MIT
Teaching Assistant (Instructors: Prof. Keith A. Nelson, Prof. Alexander M. Klibanov)

General Chemistry (Honor class) 2005 – 2007
POSTECH
Student Mentor

SELECTED PRESENTATIONS

Hwang H *et al*., Poster presentation at the 24th Korean Society for Brain and Neural Science (KSBNS) Annual Meeting, Incheon, South Korea, May 2021

Hwang H *et al*., Poster presentation at the 23rd Korean Society for Brain and Neural Science (KSBNS) Annual Meeting, Seoul, South Korea, Nov 2020

Hwang H *et al*., Oral presentation at the 19th Korean Society for Brain and Neural Science (KSBNS) Annual Meeting, Goyang, South Korea, Sep 2016

Hwang H *et al*., Poster presentation at the Gordon Research Conferences, Molecular & Cellular Neurobiology, Hong Kong, Jun 2016

Hwang H *et al*., Oral presentation at the 8th Annual Dana & Betty Fisher Retreat of the Picower Institute, Cape Cod, MA, USA, Jun 2015

Hwang H *et al*., Poster presentation at the Gordon Research Conferences, Excitatory Synapses & Brain Function, Newport, RI, USA, Jun 2015

Hwang H *et al*., Poster presentation at the 43rd Annual Meeting of the Society for Neuroscience (SfN), San Diego, CA, USA, Nov 2013

Hwang H *et al*., Oral presentation at the 6th Annual Dana & Betty Fisher Retreat of the Picower Institute, Cape Cod, MA, USA, May 2013

PROFESSIONAL ACTIVITIES

Ad-hoc Reviewer

NeuroMolecular Medicine

Academic Organization

New England Bioscience Society (NEBS)	2011.09 – 2016.06
MIT Biotech Group	2015.03 – 2016.06
Society for Neuroscience	2013.03 – *Present*