

Hyeonwoo Kim, Ph.D.

Assistant professor

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EDUCATION

- 2013** **Ph.D., Cell Regulation**
University of Texas Southwestern Medical Center, Dallas, Texas, USA
Thesis: "Identification of cellular sensors for unsaturated fatty acids" (Advisor: Dr. Jin Ye)
- 2007** **M.S., Chemistry**
Seoul National University, Seoul, Korea
Thesis: "Crystallization and preliminary X-ray crystallographic analysis of tRNA (m1G37) methyltransferase from *Haemophilus Influenzae*" (Advisor: Dr. Se Won Suh)
- 2002** **B.S., Chemistry**
Seoul National University, Seoul, Korea

RESEARCH EXPERIENCE

- 2022 – Present** **Assistant Professor**
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
- 2022 – 2022** **Visiting Assistant Professor**
Harvard School of Dental Medicine, Boston, Massachusetts, USA
- 2016 – 2022** **Postdoctoral Fellow**
Dana-Farber Cancer Institute/Harvard Medical School, Boston, Massachusetts, USA
Advisor: Dr. Bruce Spiegelman
- 2013 - 2016** **Postdoctoral Fellow**
University of Texas Southwestern Medical Center, Dallas, Texas, USA
Advisor: Dr. Jin Ye
- 2007 - 2008** **Research Assistant**
Seoul National University, Seoul, Korea
Advisor: Dr. Se Won Suh
- 2000 - 2002** **Undergraduate Research Assistant**
Seoul National University, Seoul, Korea
Advisor: Dr. Se Won Suh

HONORS/PRESENTATION

- Awards

- 2021** **NEBS-GENOSCO Award**, New England Bioscience Society, Boston, MA, USA
- 2013** **Early Career Investigator Awards of Excellence**, Kern Lipid Conference, Vail, Colorado, USA
- 2012** **Best Student Presentation**, Annual Cell Regulation Symposium, University of Texas Southwestern Medical Center, Dallas, Texas, USA

- Oral Presentations

- 2022** **Invited Speaker**, Spring Congress of The Korean Society For Gerontology "Deciphering exercise at molecular levels and its therapeutic application to metabolic diseases" Daegu, South Korea
- 2022** **Invited Speaker**, Korean Society for Biochemistry and Molecular Biology (KSBMB) International Conference 2022 (Cell-Matrix Interface in Physiology and Disease) "Irisin, its Receptor and the Links between Exercise and Health" Busan, South Korea

- 2022 **Invited Speaker**, 35th Spring Congress of Korean Diabetes Association (Basic research 2: Novel insights into muscle and adipose tissue) "Irisin, its Receptor and the Links between Exercise and Health" Gyeongju, South Korea
- 2022 **Invited Speaker**, Annual Symposium on Science, Technology, and Education & Spring Symposium of Korean Endocrine Society (Current Topics in Metabolic Research) "Irisin, its Receptor and the Links between Exercise and Health" Seoul, South Korea
- 2021 **Invited Speaker**, The Seminar of Mechanobiology and Muscle Bone Crosstalk Research Team at the Indiana Center of Musculoskeletal Health (ICMH) "Irisin, its Receptor and the Links between Exercise and Health" Indianapolis, Indiana, USA
- 2021 **NEBS-GENOSCO Award lecture**, New England Bioscience Society, "Irisin in the treatment of Duchenne Muscular Dystrophy" Boston, Massachusetts, USA (Virtual Meeting)
- 2021 **Invited Speaker**, 2021 Joint Crosstalk Symposium, "Irisin acts on Bone via α V Integrin Receptors" UCSF Musculoskeletal Center. San Francisco, California, USA (Virtual Meeting)
- 2020 **Selected Speaker**, Cancer Biology Seminar, "Irisin in the treatment of Duchenne Muscular Dystrophy" Dana-Farber Cancer Institute, Boston, Massachusetts, USA (Virtual Meeting)
- 2020 **Organizer and Invited Speaker**, the Australian Space Biology Symposium (ASBS), "Irisin acts on Bone via α V Integrin Receptors" Sydney, Australia (Virtual Meeting)
- 2020 **Invited Speaker**, the 8th Seoul Symposium on Bone Health & the 32nd Scientific Congress of the Korean Society for Bone and Mineral Research, "Irisin acts on Bone and Fat via α V Integrin Receptors" Seoul, South Korea (Virtual Meeting)
- 2020 **Selected Speaker**, New England Bioscience Society-Seoul National University College of Medicine Online Symposium, "Irisin acts on osteocytes and osteoclasts in vitro and in vivo to enhance bone resorption via alpha V integrin receptors" Boston-Seoul, USA-South Korea (Virtual Meeting)
- 2019 **Invited Speaker**, 2019 Annual Meeting of American Association for Anatomy (AAA) at Experimental Biology (Messages from Muscle and Bone), "Irisin Mediates Effects on Bone via α V Integrin Receptors" Orlando, Florida, USA
- 2019 **Invited Speaker**, New England Bioscience Society, "Irisin Mediates Effects on Bone and Fat via α V Integrin Receptors" Boston, Massachusetts, USA
- 2019 **Selected Speaker**, Keystone Symposia (Obesity and Adipose Tissue Biology), "Irisin Induces Thermogenesis in Fat via Integrin α V Receptors" Banff, Canada
- 2018 **Chalk Talk Speaker**, JPB Diabetes Research Consortium, "Irisin Mediates Effects on Bone via α V Integrin Receptors" New York, New York, USA
- 2018 **Selected Speaker**, American Society for Bone and Mineral Research (ASBMR) Annual Meeting, "Irisin Mediates Effects on Bone via α V Integrin Receptors" Montreal, Canada
- 2018 **Invited Speaker**, Cardiology Educational Seminar, "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA
- 2018 **Invited Speaker**, Brain Lunch Seminar, "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" Dana-Farber Cancer Institute, Boston, Massachusetts, USA
- 2018 **Selected Speaker**, Cell Biology Trainee Talks, "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" Harvard Medical School, Boston, Massachusetts, USA
- 2018 **Speaker**, JPB Joint Consortia Meeting, "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" New York, New York, USA
- 2018 **Selected Speaker**, Keystone Symposia (Bioenergetics and Metabolic Disease), "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" Keystone, Colorado, USA
- 2018 **Selected Speaker**, Cancer Biology Seminar, "Irisin Mediates Beneficial Exercise-induced Effects via Integrins" Dana-Farber Cancer Institute, Boston, Massachusetts, USA
- 2016 **Selected Speaker**, McGarry Symposium, "UAS domain: a novel sensor for Fatty acids regulated lipid homeostasis and Cancer Growth" University of Texas Southwestern Medical Center, Dallas, Texas, USA
- 2012 **Selected Speaker**, Annual Cell Regulation Symposium, "Identification of UAS domain as a motif polymerizing upon interaction with unsaturated fatty acid" University of Texas Southwestern Medical Center, Dallas, Texas, USA
- 2010 **Selected Speaker**, Annual Cell Regulation Symposium, "Identification of Ubxd8 protein as a sensor for unsaturated fatty acids" University of Texas Southwestern Medical Center, Dallas, Texas, USA

PUBLICATIONS

- Research Articles

1. Kim, E., **Kim, H.**, Jedrychowski, M.P., Bakiasi, G., Park, J., Choi, Y., Kwak, S.S., Kim, D.Y., Wrann, C., Spiegelman, B.M., Tanzi, R.E., Choi, S.H., “Exercise-Induced Irisin reduces Amyloid- β deposition by inducing the release of neprilysin from astrocytes following downregulation of ERK-STAT3 signaling” *Neuron*, 2022, In review.
2. Kam. T.I., Park, H., Chou, S.C., Van Vranken, J.G., Mittenbühler, M.J., **Kim, H.**, A, Mu, Choi, Y.R., Karuppagounder, S.S, Biswas, D., Wang, J., Shin, Y, Loder, A., Dawson, V.L., Spiegelman, B.M., Dawson, T.M. “Amelioration of Pathologic α -Synuclein-Induced Parkinson’s Disease by Irisin” *Proc. Natl. Acad. Sci. (USA)*, 2022, In press.
3. Cui, S., Simmons, G., Vale, G., Deng, Y., Kim, J., **Kim, H.**, Zhang, R., McDonald, J., Ye, J., “FAF1 Blocks Ferroptosis by Inhibiting Peroxidation of Polyunsaturated Fatty Acids” *Proc. Natl. Acad. Sci. (USA)*, 2022, 17: e2107189119.
4. Islam, M., Valaris, S., Young, M., Haley E., Luo, R., Bond, S., Kitchen R., Caldarone, B., Bettio, L., Christie, L., Schmieder, A., Soberman, R., Besnard, A., Jedrychowski, M., **Kim, H.**, Choi, S., Tanzi, R., Spiegelman, B., Wrann, C., “Exercise hormone irisin is a critical regulator of cognitive function” *Nature Metabolism*, 2021, 3:1058-1070 (PMID: 34417591).
5. Estell, E., Le, P., Vegting, Y., **Kim, H.**, Wrann, C., Boussein, M., Nagano, K., Baron, R., Spiegelman, B., Rosen, C., "Irisin directly stimulates osteoclastogenesis and bone resorption *in vitro* and *in vivo*” *eLife*, 2020, 9:e58172 (PMCID: PMC7444909).
6. Oguri, Y.*, Shinoda, K.*, **Kim, H.***, Alba, D.L., Bolus, W.R., Wang, Q., Brown, Z., Pradhan, R.N., Tajima, K., Yoneshiro, T., Ikeda, K., Chen, Y., Cheang, R.T., Tsujino, K., Kim, C.R., Greiner, V.J., Datta, R., Yang, C.D., Atabai, K., McManus, M.T., Koliwad, S.K., Spiegelman, B.M., Kajimura, S., “CD81 Controls Beige Fat Progenitor Cell Growth and Energy Balance via FAK Signaling” *Cell*, 2020, 182(3):563-577.e20 (PMCID: PMC7415677) (* **Equal contribution as a co-first author**).
7. **Kim, H.**, Wrann, C., Jedrychowski, M., Vidoni S., Kitase Y., Nagano K., Zhou C., Chou Z., Parkman V., Novick, S., Strutzenberg T., Pascal, B., Le P., Brooks, D., Roche, A., Gerber, K., Mattheis, L., Chen, W., Tu, H., Boussein, M., Griffin, P., Baron, R., Rosen, C., Bonewald, L., and Spiegelman, B., “Irisin Mediates Effects on Bone and Fat via α V Integrin Receptors” *Cell*, 2018, 175: 1756–1768 (PMCID: PMC6298040).
8. Zhang, Y., Udayakumar, D., Cai, L., Hu, Z., Kapur, P., Kho, E., Pavía-Jiménez, A., Fulkerson, M., Leon, A., Yuan, Q., Dimitrov, I., Yokoo, T., Ye, J., Mitsche, M., **Kim, H.**, McDonald, J., Xi, Y., Aadhuranthakam, A., Dwivedi, D., Lenkinski, R., Cadeddu, J., Margulis, V., Brugarolas, J., DeBerardinis, R., and Pedrosa I., “Addressing metabolic heterogeneity in clear cell renal cell carcinoma with quantitative Dixon MRI” *JCI Insight*, 2017, 2: e94278 (PMCID: PMC5543910).
9. **Kim, H.**, Rodriguez-Navas, C., Kollipara, R., Kapur, P., Pedrosa, I., Brugarolas, J., Kittler, R., Ye, J., “Unsaturated Fatty Acids Stimulate Tumor Growth through Stabilization of β -Catenin” *Cell Reports*, 2015, 13:495-503 (PMCID: PMC4618234).
10. **Kim, H.**, Zhang, H., Meng, D., Russell, G., Lee, J.N., Ye, J., “UAS Domain of Ubxd8 and FAF1 Polymerizes upon Interaction with Long Chain Unsaturated Fatty Acid” *J. Lipid.Res.*, 2013, 54: 2144-2152 (PMCID: PMC3708364).
11. Lee, J.N.*, **Kim, H.***, Yao, H., Chen, Y., Weng, K., Ye, J., “Identification of Ubxd8 protein as a sensor for unsaturated fatty acids and regulator of triglyceride synthesis” *Proc. Natl. Acad. Sci. (USA)*, 2010, 107: 21424-21429 (PMCID: PMC3003070) (* **Equal contribution as a co-first author**).
12. Yoon, H. J., Kim, H. L., Lee, S. K., **Kim, H. W.**, Kim, H. W., Lee, J. Y., Mikami, B., and Suh, S. W. "Crystal structure of peptide deformylase from *Staphylococcus aureus* in complex with actinonin, a naturally occurring antibacterial agent" *Proteins*, 2004, 57: 639-642 (PMID: 15382235).

13. **Kim, H.***, Yoon, H. J.*, Kim, H. W., Mikami, B., and Suh, S. W. "Crystallization and preliminary X-ray crystallographic analysis of peptide deformylase from *Staphylococcus aureus*" *Korean J. Crystallogr.*, 2004, 15: 40-43 (* **Equal contribution as a co-first author**).
14. **Kim, H.***, Ahn, H. J. *, Yoon, H. J., Kim, H. W., Baek, S.-H. & Suh, S. W. "Crystallization and preliminary X-ray crystallographic analysis of tRNA(m1G37) methyltransferase from *Haemophilus influenzae*" *Acta Crystallograph Sect D Struct Biol Cryst Commun.*, 2003, D59: 183-184 (PMID: 12499565) (* **Equal contribution as a co-first author**).
15. Ahn, H. J., **Kim, H.**, Yoon, H.-J., Lee, B. I., Suh, S. W., and Yang, J. K. "Crystal structure of tRNA(m1G37) methyltransferase: Insights into tRNA recognition" *EMBO J.*, 2002, 22: 2593-2603 (PMCID: PMC156765).

- Review Article

1. **Kim, H.**, Ye, J. "Cellular responses to excess fatty acids: focus on ubiquitin regulatory X domain-containing protein 8" *Curr. Opin. Lipidol.*, 2014, 25: 118-124 (PMID: 24378746).