Haejin Yoon, Ph.D.

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Education

Ph.D. in Department of Biomedical Sciences and Pharmacology 2014
College of Medicine, Seoul National University, Seoul, South Korea
Dissertation: Inhibitory roles of the lysyl-acetyltransferase ARD1 in bone development and regeneration : ARD1 controls osteoblast differentiation by inhibiting Runx2 in a feedback manner
Advisor: Professor Jong-Wan Park

M.S. in Department of Biomedical Sciences and Pharmacology 2011
College of Medicine, Seoul National University, Seoul, South Korea
Dissertation: Study on the regulation mechanism of HIF-1α N-terminal TAD
Advisor: Professor Jong-Wan Park

B.S. in Department of Biology 2009
Kon-Kuk University, Seoul, South Korea
Advisor: Professor Kyungho Lee

Research Experience

Postdoctoral Fellow, Department of Cell Biology, Harvard Medical School, Boston, MA 2015-present
- Contributions of mitochondria to cell metabolism (Cell biology)

Researcher, Ischemic/Hypoxic Disease Institute, South Korea 2014-2015
- The role of histone modification and epigenetic modulation in hypoxia on ovarian cancer therapy (Cell biology, Epigenetics)

Ph.D. and Master Research Assistant, Department of Biomedical Sciences and Pharmacology, Seoul National University, Seoul, South Korea 2009-2014
- Roles of the post-translational modifications (PTMs) in human physiology and disease
- Molecular mechanism of metabolic enzymes in hypoxia (Cell biology, Molecular biology, Bone physiology)

Researcher, Macrogen, Geumcheon-gu, Seoul, South Korea 2007
- Providing different platforms on next-generation sequencing (NGS) (Biotechnology research and development)

Undergraduate Researcher 2005-2006
Department of Biological Science, Konkuk University, South Korea
- Dissecting signal transduction and regulation of transcriptions in cancer (Cell Biology)

Publications

1. Wong SJ, Ringel AE, Yuan W, Paulo JA, **Yoon H**, Currie MA, Haigis MC. Development of a colorimetric α-ketoglutarate detection assay for prolyl hydroxylase domain (PHD) proteins. *J Biol Chem*. 2021. 100397. PMID: 33571527

2. Ringel AE, Drijvers JM, Baker GJ, Catozzi A, García-Cañaveras JC, Gassaway BM, Miller BC, Juneja VR, Nguyen TH, Joshi S, Yao C, **Yoon H**, Sage PT, LaFleur MW, Trombley JD, Jacobson CA, Maliga Z, Gygi SP, Sorger PK, Rabinowitz JD, Sharpe AH, Haigis MC. Obesity Shapes Metabolism in the Tumor Microenvironment to Suppress Anti-Tumor Immunity. *Cell.* 2020. 183(7):1848-1866. PMID: 33301708

3. **Yoon H**, Spinelli JB, Zaganjor E, Wong SJ, German NJ, Randall EC, Dean A, Clermont A, Paulo JA, Garcia D, Li H, Rombold O, Agar NYR, Goodyear LJ, Shaw RJ, Gygi SP, Auwerx J, Haigis MC. PHD3 loss promotes exercise capacity and fat oxidation in skeletal muscle. *Cell Metab*. 2020. 32(2):215-228.e7. PMID: 32663458

4. Zaganjor E, **Yoon H**, Spinelli JB, Laurent G, Keskinidis P, Mulei S, Sivaloganathan S, Van de Ven R, Li Y, Clish CB, Haigis MC. SIRT4 mediated regulation of branched-chain amino acid catabolism promotes early adipogenesis and insulin sensitivity. *Cell Report* [In press]

5. Randall EC, Lopez BGC, Peng S, Regan MS, Abdelmoula WM, Basu SS, Santagata S, **Yoon H**, Haigis MC, Agar JN, Tran NL, Elmquist WF, White FM, Sarkaria JN, Agar NYR. Localized metabolomic gradients in patient-derived xenograft models of glioblastoma. *Cancer Res*. 2019. CAN-19-0638. PMID: 31767628

6. Gonzalez Herrera KN, Zaganjor E, Ishikawa Y, Spinelli JB, **Yoon H**, Lin JR, Satterstrom FK, Ringel A, Mulei S, Souza A, Gorham JM, Benson CC, Seidman JG, Sorger PK, Clish CB, Haigis MC. Small-molecule screen identifies de novo nucleotide synthesis as a vulnerability of cells lacking SIRT3. *Cell Rep*. 2018. 22(8):1945-1955. PMID: 29466723

7. Kang J*, Shin SH*, **Yoon H***, Huh J, Shin HW, Chun YS, Park JW. FIH is an oxygen sensor in ovarian cancer for G9a/GLP-driven epigenetic regulation of metastasis-related genes. *Cancer Res*. 2018. 78(5):1184-1199. PMID: 29259012 [* co-first author]

8. Spinelli JB, **Yoon H**, Ringel AE, Jean-Favre S, Clish CB, Haigis MC. Metabolic recycling of ammonia via glutamate dehydrogenase supports breast cancer biomass. *Science*. 2017. 358(6365):941-946. PMID: 29025995

9. Malone CF, Emerson C, Ingraham R, Barbosa W, Guerra S, **Yoon H**, Liu LL, Michor F, Haigis MC, Macleod KF, Maertens O, Cichowski K. mTOR and HDAC inhibitors converge on the TXNIP/thioredoxin pathway to cause catastrophic oxidative stress and regression of RAS-driven tumors. *Cancer Discovery*. 2017. 7(12):1450-1463. PMID: 28963352

10. German NJ, **Yoon H**, Yusuf RZ, Murphy JP, Finley LW, Laurent G, Haas W, Satterstrom FK, Guarnerio J, Zaganjor E, Santos D, Pandolfi PP, Beck AH, Gygi SP, Scadden DT, Kaelin WG Jr, Haigis MC. PHD3 loss enables reliance on fat oxidation via deactivation of acetyl-CoA aarboxylase. 2016. *Mol Cell*. 63:1006-1020. PMID: 27635760

11. Shin DH, Choi YJ, Jin P, **Yoon H**, Chun YS, Shin HW, Kim JE, Park JW. Distinct effects of SIRT1 in cancer and stromal cells on tumor promotion. *Oncotarget*. 2016. 7(17):23975-87. PMID: 26992208

12. Lee M, Kim DW, **Yoon H**, So D, Khalmuratova R, Rhee CS, Park JW, Shin HW. Sirtuin 1 attenuates nasal polypogenesis by suppressing epithelial-to-mesenchymal transition. *J Allergy Clin Immunol*. 2016. 137(1):87-98.e7. PMID: 26342525

13. **Yoon H**, Kim HL, Chun YS, Shin DH, Lee KH, Shin CS, Lee DY, Kim HH, Lee ZH, Ryoo HM, Lee MN, Taeg Oh G, Park JW. NAA10 controls osteoblast differentiation and bone formation as a feedback regulator of Runx2. *Nat Commun*. 2014. 5:5176. PMID: 25376646

14. Shin SH, **Yoon H**, Chun YS, Shin HW, Lee MN, Oh GT, Park JW. Arrest defective 1 regulates the oxidative stress response in human cells and mice by acetylating methionine sulfoxide reductase A. *Cell Death Dis*. 2014. 5:e1490. PMID: 25341044

15. Kim HJ, Park JW, **Yoon H**, Shin DH, Lee ZH, Kim HH, Lee KH, Ju UI, Seok SH, Seung Lim, Chun YS. Plant homeodomain finger protein 2 promotes bone formation by demethylating and activating Runx2 for osteoblast differentiation. *Cell Res*. 2014. 24(10):1231-49. PMID: 25257467

16. **Yoon H**, Shin SH, Shin DH, Chun YS, Park JW. Differential roles of Sirt1 in HIF-1α and HIF-2α mediated hypoxic responses. *Biochem Biophys Res Commun*. 2014. 444(1):36-43. PMID: 24423936

17. **Yoon H**, Lim JH, Cho CH, Huang LE, Park JW. CITED2 controls the hypoxic signaling by snatching p300 from the two distinct activation domains of HIF-1α. *Biochim Biophys Acta*. 2011. 1813(12):2008-16. PMID: 21925214

18. Lee YM, Lim JH, **Yoon H**, Chun YS, Park JW. Antihepatoma activity of chaetocin due to deregulated splicing of hypoxia-inducible factor 1α pre-mRNA in mice and in vitro. *Hepatology*. 2011. 53(1):171-80. PMID: 21140472

Honors

- Finalist for Pilot and Feasibility Awards Program, Harvard Digestive Disease Center 2021
- Poster Award: FASEB Science Research Conference (SRC) on Nutrient Sensing and Metabolic Signaling Conference 2020
- KASBP-KHIDI/Eabssy fellowship: Korean-American professional community in biotechnology and pharmaceuticals (KASBP). 2020
- Poster Award: Cold Spring Harbor Asia meeting 2016 on Cancer and Metabolism 2016
- ASBMB 2015 graduate/postdoctoral travel award 2015
- Award of Promising Pharmacological Scientist in Korean Society of Pharmacology, Korean Society of Pharmacology, Korea 2014
- Best Graduate Student Award, College of Medicine, Seoul National University 2014

Fellowships

- American Diabetes Association 1-17-PDF-109, *Past* 2017-2019

"SIRT4 loss activates oxidative stress in adipocytes through NNT deacylation to increase insulin resistance" (Principal Investigator: Haejin Yoon)

- National Research Foundation of Korea 2016R1A6A3A03010660, *Past* 2016-2017
  "Inhibitory roles of hydroxylase PHD3 in regulation of fatty acid oxidation and alteration of cancer metabolism" (Principal Investigator: Haejin Yoon)
- NIH/NIDDK Mentored Research Scientist Development Award (K01 No Independent Clinical Trials), *Pending*
  "Defining the role of prolyl hydroxylase 3 (PHD3) in lipid metabolism and insulin signaling which impacts obesity" (Principal Investigator: Haejin Yoon)
- Harvard Digestive Disease Center, Pilot and Feasibility Awards Program, *Pending*
  "Defining the role of PHD3 in lipid metabolism which impacts obesity" (Principal Investigator: Haejin Yoon)

Oral Presentations

- 12th Annual Course on Isotope Tracers in Metabolic Research: Principles and Practice of Kinetic Analysis (NIH/MMPC sponsored course) 2019
- Annual Glenn Symposium on the Biology of Aging 2018
- Cold Spring Harbor conference on Nutrient Signaling 2018
- 2017 International Congress of Diabetes and Metabolism, *Invited talk* 2017
- The Korean Society of Pharmacology Annual Congress 2014 2014
- SRC/Bone metabolism Research Center, Korea 2013
- SRC/Bone metabolism Research Center, Korea 2012
- Ischemic/Hypoxic disease Institute, Seoul National University College of Medicine, Korea 2012
- SRC/Bone metabolism Research Center, Korea 2011
- Ischemic/Hypoxic disease Institute, Seoul National University College of Medicine, Korea 2011

Teaching and Training Experience

- Curricular Practical Training Program Teaching and Mentoring, Massachusetts College of Pharmacy and Health Sciences University 2020
- Certification of Completion 'Scientists Teaching Science', Harvard Medical School 2020
- Teaching Assistant for Pharmacology 2012
  Seoul National University College of Medicine, Seoul, South Korea
  - tutored undergraduate students for Pharmacology (4 hours/week) and graded exams.

Mentorship Experience

- Cell Biology Research Scholars Program (CRSP) Mentoring 2017-2018
  Esther Hahjin Park (Teach for America), Linh Chu (Brigham and Women's Hospital), and April Lee (Massachusetts Institute of Technology)
- Undergraduate exchange student from School of Pharmaceutical Science and Technology Tianjin University, China 2016-2017
  Wen Yang (Indiana University Bloomington)