Sung Hoon Baik, Ph.D.

RESERACH INTERESTS

Energy Metabolism and Cellular Signaling, Metabolic Reprogramming, Mitochondrial Metabolites, Aerobic Glycolysis, Oxidative Phosphorylation, Amino Acid Metabolism, Cellular Activation, Innate Immune Cells, Inflammation, Alzheimer's Disease, Hereditary Leiomyomatosis and Renal Cell Cancer, FH-Deficiency, Tumor Microenvironment

EDUCATION

SEP 2013-AUG 2018	Doctoral Degree in Biomedical science, **Seoul National University**, Korea Dissertation: "The Study on the Metabolic Alterations of Glial Cells in the Pathogenesis of Alzheimer's Disease" ❙ Advisor: Prof. Inhee Mook-Jung GPA: 3.86/4.3, (*summa cum laude*)
SEP 2011-AUG 2013	Master's Degree in Biomedical science, **Seoul National University**, Korea Dissertation: "Migration of Neutrophils Targeting Brain Amyloid Plaques in Alzheimer's Disease Mouse Model" ❙ Advisor: Prof. Inhee Mook-Jung GPA: 4.11/4.3
MAR 2005-AUG 2011	Bachelor's Degree in Life Science, **Yonsei University**, Korea GPA 3.89/4.3, (Honors-2006; 2009, High Honors-2010)

RESEARCH EXPERIENCE

JUN 2019-Present	**University of California Los Angeles**, CA Research: Metabolic Reprogramming and Tumor Microenvironment in FH-deficient Hereditary Leiomyomatosis and Renal Cell Cancer ❙ Advisor: Prof. Brian M Shuch
FEB 2016-APR 2019	**Seoul National University**, Korea Research: The Metabolic Reprogramming and Alteration of Microglia in the Alzheimer's Disease ❙ Advisor: Prof. Inhee Mook-Jung
FEB 2014-SEP 2016	**Seoul National University**, Korea Research: Intravital Multi-Photon Imaging of Microglial Activation and Its Contribution to the Alzheimer's Disease ❙ Advisor: Prof. Inhee Mook-Jung
SEP 2013-DEC 2016	**Seoul National University**, Korea Research: The Characterization of Multi-Photon Imaging Probes for Amyloid-β and Monoamine Oxidase ❙ Advisor: Prof. Inhee Mook-Jung
NOV 2011-FEB 2014	**Seoul National University**, Korea Research: The Migration of Neutrophils in the Alzheimer's Disease Mouse Model ❙ Advisor: Prof. Inhee Mook-Jung

TEACHING EXPERIENCE

DEC 2014-NOV 2016	Teaching Assistant in Department of Biochemistry, **Seoul National University**, Korea

WORK EXPERIENCE

JUN 2019-Present	Research scholar in **University of California Los Angeles**, CA Research: Metabolic Reprogramming and Tumor Microenvironment in FH-deficient Hereditary Leiomyomatosis and Renal Cell Cancer ❙ Advisor: Prof. Brian M Shuch
SEP 2018-APR 2019	Researcher in **Neuroscience Research Center**, Korea Research: The Metabolic Alterations in the Alzheimer's Disease and Down Syndrome ❙ Advisor: Prof. Inhee Mook-Jung

PUBLICATIONS

1. **Baik SH**[#], Kang S[#], Lee W, Choi H, Chung S, Kim J-I, Mook-Jung I. (2019) A Breakdown in Metabolic Reprogramming Causes Microglia Dysfunction in Alzheimer's Disease. **Cell Metab**. 2019 Sep. https://doi.org/10.1016/j.cmet.2019.06.005. [#]***Equal contribution as the co-first authors.***

2. Kang S, Son SM, **Baik SH**, Yang J, Mook-Jung I. (2019) Autophagy-mediated secretory pathway is responsible for both normal and pathological tau in neurons. **JAD**. 2019 Jun 24. doi: 10.3233/JAD-190180.

3. Kim D[#], **Baik SH**[#], Kang S, Cho SW, Bae J, Cha MY, Sailor MJ, Mook-Jung I, Ahn KH. (2016) Close Correlation of Monoamine Oxidase Activity with Progress of Alzheimer's Disease in Mice, Observed by in Vivo Two-Photon Imaging. **ACS Cent. Sci.** 2016, 2 (12), pp 967–975. [#]***Equal contribution as the co-first authors.***

4. **Baik SH**[#], Kang S[#], Son SM, Mook-Jung I. (2016) Microglia Contributes to Plaque Growth by Cell Death due to Uptake of Amyloid β in the Brain of Alzheimer's Disease Mouse Model. **Glia.** 2016 Sep 23. [#]***Equal contribution as the co-first authors.***

5. Park JC, **Baik SH**, Han SH, Cho HJ, Choi H, Kim HJ, Choi H, Lee W, Kim DK, Mook-Jung I. (2016) Annexin A1 Restores $A\beta_{1-42}$-Induced Blood-Brain Barrier Disruption through the Inhibition of RhoA-ROCK Signaling Pathway. **Aging Cell.** 2016 Sep 16.

6. Cha MY, Kwon YW, Ahn HS, Jeong H, Lee YY, Moon M, **Baik SH**, Kim DK, Song H, Yi EC, Hwang D, Kim HS, Mook-Jung I. (2016) Protein-Induced Pluripotent Stem Cells Ameliorate Cognitive Dysfunction and Reduce Aβ Deposition in a Mouse Model of Alzheimer's Disease. **Stem Cells Transl Med.** 2016 Aug 15. pii: sctm.2016-0081.

7. Heo CH[#], Sarkar AR[#], **Baik SH**[#], Jung TS, Kim JJ, Kang H, Mook-Jung I and Kim HM. (2016) A Quadrupolar Two-Photon Fluorescent Probe for *In Vivo* Imaging of Amyloid-β Plaques. **Chem Sci.** 2016 Apr, 7, 4600-4606. [#]***Equal contribution as the co-first authors.***

8. Hong JH, Kang JW, Kim DK, **Baik SH**, Kim KH, Shanta SR, Jung JH, Mook-Jung I, Kim KP. (2016) Global Changes of Phospholipids Identified by MALDI Imaging Mass Spectrometry in a Mouse Model of Alzheimer's Disease. **J Lipid Res.** 2016 Jan;57(1):36-45.

9. Choi I, Kim B, Byun JW, **Baik SH**, Huh YH, Kim JH, Mook-Jung I, Song WK, Shin JH, Seo H, Suh YH, Jou I, Park SM, Kang HC, Joe EH. (2015) LRRK2 G2019S Mutation Attenuates Microglial Motility by Inhibiting Focal Adhesion Kinase. **Nat Commun.** 2015 Sep 14;6:8255.

10. Kim D[#], Moon H[#], **Baik SH**[#], Singha S[#], Jun YW, Wang T, Kim KH, Park BS, Jung J, Mook-Jung I, Ahn KH. (2015) Two-Photon Absorbing Dyes with Minimal Autofluorescence in Tissue Imaging:

Application to in Vivo Imaging of Amyloid-β Plaques with a Negligible Background Signal. **J Am Chem Soc.** 2015 Jun 3;137(21):6781-9. ***#Equal contribution as the co-first authors.***

11. Kook SY, Jeong H, Kang MJ, Park R, Shin HJ, Han SH, Son SM, Song H, **Baik SH**, Moon M, Yi EC, Hwang D, Mook-Jung I. (2014) Crucial Role of Calbindin-D28k in the Pathogenesis of Alzheimer's Disease Mouse Model. **Cell Death Differ.** 2014 Oct;21(10):1575-87.

12. Kook SY, Lee KM, Kim Y, Cha M-Y, Kang S, **Baik SH**, Lee H, Park R, Mook-Jung I. (2014) High-Dose of Vitamin C Supplementation Reduces Amyloid Plaque Burden and Ameliorates Pathological Changes in the Brain of 5XFAD Mice. **Cell Death Dis.** Feb 27;5:e1083.

13. **Baik SH**[#], Cha MY[#], Hyun YM, Cho H, Hamza B, Kim DK, Han SH, Choi H, Kim KH, Moon M, Lee J, Kim M, Irimia D, and Mook-Jung I. (2014) Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model. **Neurobiol Aging.** Jan;(14):4-9. ***#Equal contribution as the co-first authors.***

14. Heo CH, Kim KH, Kim HJ, **Baik SH**, Song H, Kim YS, Lee J, Mook-Jung I, Kim HM. (2013) A Two-Photon Fluorescent Probe for Amyloid-β Plaques in Living Mice. **Chem Commun (Camb).** Feb 14;49(13):1303-5.

15. Moon M, Hong HS, Nam DW, **Baik SH**, Song H, Kook SY, Kim YS, Lee J, Mook-Jung I. (2012) Intracellular Amyloid-β Accumulation in Calcium-Binding Protein-Deficient Neurons Leads to Amyloid-β Plaque Formation in Animal Model of Alzheimer's Disease. **J Alzheimers Dis.** 29(3):615-28.

PROFESSINAL ACTIVITIES

JUN 2016 Symposium speech in ZEISS KOREA Microscopy Workshop 2016, Korea
Dissecting Immune Systems in Alzheimer's Disease (AD) through Intravital Multi-photon Microscopy (IV-MPM) Imaging.

HRORNOS AND AWARDS

AUG 2018 Graduate *summa cum laude* in Biomedical science, Seoul National University, Korea

DEC 2017 Excellent Paper Award in Department of Biochemistry, Seoul National University, Korea
"Close Correlation of Monoamine Oxidase Activity with Progress of Alzheimer's Disease in Mice, Observed by in Vivo Two-Photon Imaging", **ACS Cent Sci**

AUG 2017 Excellent Paper Award in BK21 Plus Presentation 2017, Korea
"Close Correlation of Monoamine Oxidase Activity with Progress of Alzheimer's Disease in Mice, Observed by in Vivo Two-Photon Imaging", **ACS Cent Sci**

DEC 2016 Excellent Paper Award in Department of Biochemistry, Seoul National University, Korea
"A Quadrupolar Two-Photon Fluorescent Probe for *In Vivo* Imaging of Amyloid-β Plaques", **Chem Sci**
"Microglia Contributes to Plaque Growth by Cell Death due to Uptake of Amyloid β in the Brain of Alzheimer's Disease Mouse Model", **Glia**

DEC 2015 Excellent Paper Award in Department of Biochemistry, Seoul National University, Korea
"Two-Photon Absorbing Dyes with Minimal Autofluorescence in Tissue Imaging: Application to *In Vivo* Imaging of Amyloid-β Plaques with a Negligible Background Signal", **J Am Chem Soc**

DEC 2014 Excellent Paper Award in Department of Biochemistry, Seoul National University, Korea

"Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model", **Neurobiol Aging**

FEB 2014 Excellent Paper Award in BK21 Plus Presentation 2013, Korea
"Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model", **Neurobiol Aging**

PRESENTATIONS

MAR 2015 Poster presentation in KSBMB International Conference 2015, Korea
Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model

NOV 2014 Poster presentation in Society for Neuroscience 2014, Washington D.C.
Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model