

## Woongjae Yoo, Ph.D.

### AFFILIATION

Postdoctoral Fellow - Dr. Mariana X. Byndloss Laboratory

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### EDUCATION

MS/Ph.D. combined, Agricultural Biotechnology, Seoul National University Feb. 2017

Dissertation: Identification of the roles of EIIA<sup>Ntr</sup> in amino sugar homeostasis and virulence regulation in *Salmonella enterica* serovar Typhimurium

(Research Advisor: Dr. Sangryeol Ryu)

B.S., Food Science and Technology, Chung-Ang University Feb. 2011

### TRAINING

Postdoc. Fellow, Department of Pathology, Microbiology, and Immunology, Vanderbilt University Medical Center Sep. 2018 - Present (Research Advisor: Dr. Mariana X. Byndloss)

Postdoc. Fellow, Department of Medical Microbiology and Immunology, University of California at Davis Sep. 2017 - Aug. 2018 (Research Advisor: Dr. Andreas J. Bäumlér)

Postdoc. Fellow, BK21+ Department of Agricultural Biotechnology, Seoul National University Mar. 2017 - Aug. 2017 (Research Advisor: Dr. Sangryeol Ryu)

### PEER-REVIEWED PUBLICATIONS

**Published (JCR-2021 Impact Factor)**

1. C.D. Shelton\*, **W. Yoo\***, N.G. Shealy, T.P. Torres, J.K. Zieba, M.W. Calcutt, N.J. Foegeding, D. Kim, J. Kim, S. Ryu, and M.X. Byndloss (2022) *Salmonella* Typhimurium uses anaerobic respiration to overcome propionate-mediated colonization resistance. *Cell Reports* 38(1):110180 (\*, **co-first author**, IF = 9.423) doi: 10.1016/j.celrep.2021.110180; PMID: 34986344; PMCID: PMC8800556
2. N.G. Shealy, **W. Yoo**, and M.X. Byndloss (2021) Colonization resistance: metabolic warfare as a strategy against pathogenic Enterobacteriaceae. *Current Opinion in Microbiology* 64:82-90 (co-author, IF = 7.934) doi: 10.1016/j.mib.2021.09.014; PMID: 34688039; PMCID: PMC8612973
3. **W. Yoo**, J.K. Zieba, N.J. Foegeding, T.P. Torres, C.D. Shelton, N.G. Shealy, A.J. Byndloss, S.A. Cevallos, E. Gertz, C.R. Tiffany, J.D. Thomas, Y. Litvak, H. Nguyen, E.E. Olsan, B.J. Bennett, J.C. Rathmell, A.S. Major, A.J. Bäumlner, and M.X. Byndloss (2021) High-fat diet-induced colonocyte dysfunction escalates microbiota-derived trimethylamine *N*-oxide. *Science* 373(6556):813-818 (**First author**, IF = 47.728) doi: 10.1126/science.aba3683; PMID: 34385401; PMCID: PMC8506909
4. **W. Yoo\***, J. Choi\*, B. Park, M.X. Byndloss, and S. Ryu (2021) A nitrogen metabolic enzyme provides *Salmonella* fitness advantage by promoting utilization of microbiota-derived carbon source. *ACS Infectious Disease* 7(5):1208-1220 (\*, **co-first author**, IF = 5.084) doi: 10.1021/acsinfecdis.0c00836; PMID: 33853321; PMCID: PMC8603301
5. **W. Yoo** and M.X. Byndloss (2019) How to thrive in the inflamed gut. *Nature Microbiology* 5(1):10-11 (**First author**, IF = 17.745) doi: 10.1038/s41564-019-0642-z; PMID: 31857729
6. J. Choi, H. Kim, Y. Chang, **W. Yoo**, D. Kim, and S. Ryu (2019) Programmed delay of a virulence circuit promotes *Salmonella* pathogenicity. *mBio* 10(2):e00291-19 (co-author, IF = 7.867) doi: 10.1128/mBio.00291-19; PMID: 30967459; PMCID: PMC6456747
7. D.N. Bronner, F. Faber, E.E. Olsan, M.X. Byndloss, N.A. Sayed, G. Xu, **W. Yoo**, D. Kim, S. Ryu, C.B. Lebrilla, and A.J. Bäumlner (2018) Genetic ablation of butyrate utilization attenuates gastrointestinal *Salmonella* disease. *Cell Host and Microbe* 23(2):266-273 (co-author, IF = 21.023) doi: 10.1016/j.chom.2018.01.004; PMID: 29447698; PMCID: PMC6345573
8. H.J. Kim\*, **W. Yoo\***, K.S. Jin, S. Ryu, and H.H. Lee (2017) The role of the FliD C-terminal domain in pentamer formation and interaction with FliT. *Scientific Reports* 7(1): 4418 (\*, **co-first author**, IF = 4.379) doi: 10.1038/s41598-017-02664-6; PMID: 28667283; PMCID: PMC5493677
9. **W. Yoo\***, D. Kim\*, H. Yoon, and S. Ryu (2017) Enzyme IIA<sup>Ntr</sup> regulates *Salmonella* invasion via 1,2-propanediol and propionate catabolism. *Scientific Reports* 7:44827 (\*, **co-first author**, IF = 4.379) doi: 10.1038/srep44827; PMID: 28333132; PMCID: PMC5363084
10. **W. Yoo\***, H. Yoon\*, Y.J. Seok, C.R. Lee, H.H. Lee, and S. Ryu (2016) Fine-tuning of amino sugar homeostasis by EIIA<sup>Ntr</sup> in *Salmonella* Typhimurium. *Scientific Reports* 6:33055 (\*, **co-first author**,

IF = 4.379) doi: 10.1038/srep33055; PMID: 27628932; PMCID: PMC5024086

### Under revision (JCR-2021 Impact Factor)

1. **W. Yoo**, J.K. Zieba, N.G. Shealy, T.P. Torres, J.D. Thomas, C.D. Shelton, N.J. Foegeding, E.E. Olsan and M.X. Byndloss (2022) Microbiota-derived aspartate drives pathogenic Enterobacteriaceae expansion in the inflamed gut. *Cell Host and Microbe* (In preparation to submission, **First author**, IF = 21.023)  
- *bioRxiv* (doi: <https://doi.org/10.1101/2022.02.14.480453>)

## RESEARCH SUPPORTS

1. Postdoctoral Fellowship Program(Nurturing Next-generation Researchers) in 2020 granted by National Research Foundation of Korea(NRF) (2020. 09. ~ 2021. 08)

## HONORS AND FELLOWSHIPS

### Honors and Awards

1. 2020-2021 Sidney P. Colowick Outstanding Postdoc Award in the Division of Molecular Pathogenesis, Vanderbilt University Medical Center (2021)
2. Award for Young Scientist Lectures Participation, The Korean Society of Food Science and Technology (2017)
3. Award for Student Oral Presentation Participation, The Korean Society for Microbiology and Biotechnology (2016)
4. Award for Outstanding Poster Presentation, The Korean Society for Microbiology and Biotechnology (2015)

### Fellowships/Scholarships

1. Scholarships for Research Study and Training, Boowoon Scholarship Foundation (2017. 09. ~ 2018. 08)
2. Brain Korea 21 Plus, Department of Agricultural Biotechnology, College of Agriculture and Life Sciences, Seoul National University (2014. 01. ~ 2015. 02)
3. Brain Korea 21, Department of Agricultural Biotechnology, College of Agriculture and Life Sciences, Seoul National University (2011. 01. ~ 2013. 02)
4. Scholarships for Grades, Department of Food Science and Technology, College of Biotechnology and Natural Resources, Chung-Ang University (2008. 03. ~ 2011. 02)

5. Scholarships for Grades, Boowoon Scholarship Foundation (2003. 03. ~ 2011. 02)

## INVITED TALKS

1. **W. Yoo.** Gut pathogen's last breath and diseases: High-fat diet-induced intestinal inflammation links gut dysbiosis and cardiovascular disease. **Food Science and Biotechnology Seminar - Ewha Womans University, South Korea (2022. 05)**
2. **W. Yoo.** Gut pathogen's last breath and diseases: High-fat diet-induced intestinal inflammation links gut dysbiosis and cardiovascular disease. **Medical School Seminar - Chonnam National University, South Korea (2022. 04)**
3. **W. Yoo.** Gut pathogen's last breath and diseases: High-fat diet-induced intestinal inflammation links gut dysbiosis and cardiovascular disease. **Graduate School of Medical Science and Engineering Seminar - KAIST, South Korea (2022. 04)**
4. **W. Yoo.** Gut pathogen's last breath and diseases: High-fat diet-induced intestinal inflammation links gut dysbiosis and cardiovascular disease. **Biological Sciences Seminar - Seoul National University, South Korea (2022. 02)**
5. **W. Yoo.** High-fat diet-induced colonocyte dysfunction links gut dysbiosis and cardiovascular disease. **Molecular Pathogenesis Trainee Seminar - Vanderbilt University Medical Center, USA (2021. 12)**
6. **W. Yoo.** High-fat diet-induced colonocyte dysfunction links gut dysbiosis and cardiovascular disease. **Translational Genomics Seminar - Seoul National University Hospital, South Korea (2021. 11)**
7. **W. Yoo.** High-fat diet-induced colonocyte dysfunction links gut dysbiosis and cardiovascular disease. **Food and Nutrition Seminar - Yonsei University, South Korea (2021. 11)**
8. **W. Yoo.** High-fat diet-induced colonocyte dysfunction links gut dysbiosis and cardiovascular disease. **Food Science and Technology Seminar - Chung-Ang University, South Korea (2021. 09)**

## TEACHING EXPERIENCES

2022 - Present	Mentor to Graduate Student, Monique S. Porter (VUMC)
2021 - Present	Mentor to Graduate Student, Amelia Cephas (VUMC)
2019 - Present	Mentor to Graduate Student, Nicolas G. Shealy (VUMC)
2019 - Present	Mentor to M.D-Ph.D. Student, Teresa P. Torres (VUMC)
2018 - 2019	Mentor to Undergraduate Student, Julia D. Thomas (VUMC)
2018 - Present	Mentor to Graduate Student, Catherine D. Shelton (VUMC)
2018 - 2021	Mentor to Scientific Research Assistant, Jacob K. Zieba (VUMC)

## SELECTED PRESENTATIONS

### Oral

1. **W. Yoo**, D. Kim, J. Choi, H. Yoon, and S. Ryu. Enzyme IIA<sup>Ntr</sup> Regulates *Salmonella* Fitness and Virulence via 1,2-propanediol and Propionate Catabolism. 84<sup>th</sup> International Symposium & Annual Meeting organized by the Korea Society of Food Science and Technology. Jun. 21-23, 2017. Jeju, Korea. (p 362) (*Award for Participation in Young Scientist Lectures*)
2. **W. Yoo**, H. Yoon, Y. J. Seok, C. R. Lee, H. H. Lee, and S. Ryu. Maintenance of Amino Sugar Homeostasis by Direct Interaction between EIIA<sup>Ntr</sup> and GlnS in *Salmonella* Typhimurium. 43<sup>rd</sup> International Symposium & Annual Meeting organized by the Korean Society for Microbiology and Biotechnology. Jun. 22-24, 2016. Daejeon, Korea. (p 245) (*Award for Participation in Student Presentation*)

### Poster

1. **W. Yoo**, J.K. Zieba, T.P. Torres, C.D. Shelton, N.J. Foegeding, J.D. Thomas, E.E. Olsan, and M.X. Byndloss. Microbiota-derived aspartate drives *Salmonella* expansion during colitis. DDRC Retreat. Mar. 04, 2020. Nashville, Tennessee, U.S.A.
2. **W. Yoo**, E.E. Olsan, J.K. Zieba, C.D. Shelton, J.D. Thomas, and M.X. Byndloss. Microbiota-derived aspartate drives *Salmonella* expansion during colitis. Salmonella Biology and Pathogenesis Gordon Research Conference. Jun. 02-07, 2019. Easton, Massachusetts, U.S.A.
3. **W. Yoo**, J.K. Zieba, J.D. Thomas, and M.X. Byndloss. Microbiota-derived aspartate drives *Salmonella* expansion during colitis. VI4 Annual Symposium 2019. Apr. 10, 2019. Nashville, Tennessee, U.S.A.
4. **W. Yoo**, H. Yoon, and S. Ryu. EIIA<sup>Ntr</sup> Plays A Key Role in *Salmonella* Fitness and Virulence via 1,2-propanediol Metabolism. FEMS 7<sup>th</sup> Congress of European Microbiologists. Jul. 09-13, 2017. Valencia, Spain.
5. D. Kim, **W. Yoo**, H. Yoon, and S. Ryu. Enzyme IIA<sup>Ntr</sup> Regulates the Propionate Catabolism Associated with *Salmonella* Invasion. ASM 117<sup>th</sup> general meeting. Jun. 01-05, 2017. New Orleans, Louisiana, U.S.A. (SUNDAY – 765)
6. **W. Yoo**, H. Yoon, and S. Ryu. EIIA<sup>Ntr</sup> Regulates *Salmonella* Fitness and Virulence via 1,2-Propanediol Utilization Pathway. ASM 117<sup>th</sup> general meeting. Jun. 01-05, 2017. New Orleans, Louisiana, U.S.A. (SATURDAY – 888)
7. **W. Yoo**, H. Yoon, D. Kim, Y. J. Seok, C. R. Lee, H. H. Lee, and S. Ryu. Maintenance of Amino

- Sugar Homeostasis by Direct Interaction between EIIA<sup>Ntr</sup> and GlmS in *Salmonella* Typhimurium. 5<sup>th</sup> ASM Conference on Salmonella. Aug. 29 - Sep. 01, 2016. Potsdam, Germany. (p 37)
8. D. Kim, **W. Yoo**, H. Yoon, and S. Ryu. Enzyme IIA<sup>Ntr</sup> Regulates the Propionate Metabolism Which Is Involved in *Salmonella* Invasion. 5<sup>th</sup> ASM Conference on Salmonella. Aug. 29 - Sep. 01, 2016. Potsdam, Germany. (p 37)
  9. **W. Yoo**, H. Yoon, and S. Ryu. Genome-Wide Transcriptome Analysis of *Salmonella enterica* serovar Typhimurium Lacking *ptsN*. ASM 115<sup>th</sup> general meeting. May 30 - Jun. 02, 2015. New Orleans, Louisiana, U.S.A. (p 135)
  10. D. Kim, **W. Yoo**, H. Yoon, and S. Ryu. Enzyme IIA<sup>Ntr</sup> Is Associated with Regulation of Propionate Metabolism Affecting the Invasion Ability of *Salmonella enterica* serovar Typhimurium. ASM 115<sup>th</sup> general meeting. May 30 - Jun. 02, 2015. New Orleans, Louisiana, U.S.A. (p 135)
  11. **W. Yoo**, H. Yoon, and S. Ryu. The Enzyme IIA<sup>Ntr</sup> (EIIA<sup>Ntr</sup>) Regulates Amino Sugar Metabolism by Direct Interaction with Glucosamine-6-phosphate Synthase (GlmS) in *Salmonella enterica* serovar Typhimurium. ASM 114<sup>th</sup> general meeting. May 17-20, 2014. Boston, Massachusetts, U.S.A. (p 135)