Tolunay Beker Aydemir Ph.D.
Assistant Professor
Division of Nutritional Sciences, Cornell University
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EDUCATION:

Biochemistry and Molecular Biology, Ph.D., University of Florida, College of Medicine, Gainesville, FL
Thesis: Role of Zinc and Zinc Transporters in Liver Regeneration
Mentor: Robert J. Cousins, Ph.D.

Molecular Hepatology, M.S., Ankara University School of Medicine, Ankara, Turkey
Thesis: Detection of anti-HBV Activation in HepAD38 Cell Lines
Mentor: Mithat A. Bozdayi, Ph.D.

Biology, B.S., Ankara University Science Faculty, Ankara, Turkey

RESEARCH AND PROFESSIONAL EXPERIENCE:

Assistant Professor, 2018-present
Division of Nutritional Sciences, Cornell University, Ithaca, NY
Assistant Research Professor, 2016–2018
Center for Nutritional Sciences, Food Science and Human Nutrition Department, University of Florida, Gainesville, Florida
Postdoctoral Associate, 2011–2016
Nutritional Genomics Laboratory, Center for Nutritional Sciences, Food Science and Human Nutrition Department, University of Florida, Gainesville, Florida
Graduate Assistant, 2006–2011
University of Florida College of Medicine, Biochemistry and Molecular Biology, Gainesville Florida/ Nutritional Genomics Laboratory, Center for Nutritional Sciences, University of Florida, Gainesville, Florida
Biological Scientist, 2004–2006
Nutritional Genomics Laboratory, Center for Nutritional Sciences, University of Florida, Gainesville, Florida.
Student Trainee, 2002–2004
Laboratory of Biochemical Pharmacology, Emory University, VA Medical Center, Atlanta, Georgia.

TEACHING:

Instructor:

NS 3450, Introduction to Physiochemical and Biological Aspects of Foods, 2019-2023
Cornell University, Division of Nutritional Sciences

NS 6310, Micronutrients: Function, Homeostasis, and Assessment, 2020-2023
Cornell University, Division of Nutritional Sciences

HUN 2201, Fundamentals of Human Nutrition, 2018
University of Florida, Food Science and Human Nutrition Department

Guest Lecturer:

NS 3150, Obesity and the Regulation of Body Weight, 2020-Present
Cornell University, Division of Nutritional Sciences

HONORS/AWARDS:

- Graduate Student Research Award Finalist, Experimental Biology, April 9–13, 2011, Washington, DC. Zip14 and Zip6 transporter upregulation decreases inhibition of HGF receptor phosphorylation in murine liver regeneration.
- Technology Innovator, 2013, University of Florida, Office of Technology Licensing
- Future Leader Award Finalist, Experimental Biology, April 22–27, 2017, Chicago, IL. Zip14-mediated zinc transport contributes to regulation of glucose homeostasis in intestine, pancreas and liver.
- Excellence in Advising Award, 2023, Cornell University, College of Human Ecology.

PROFESSIONAL SOCIETIES:

2020-	Member, The International Society for Zinc Biology
2020-	Member, American Physiological Society
2010–	Member, American Society for Nutrition
2010–	Member, American Society for Biochemistry and Molecular Biology
2011–2019	Member, Sigma Xi

PUBLICATIONS:

***Corresponding author**

1. Hung YH, Kim Y, Mitchell SB, Thorn TL, **Aydemir TB.*** Absence of *Slc39a14/Zip14* in mouse pancreatic beta cells results in hyperinsulinemia. Am J Physiol Endocrinol Metab. 2024 Jan 1;326(1):E92-E105. doi: 10.1152/ajpendo.00117.2023. PubMed PMID: 38019082.
2. Mitchell SB, Thorn TL, Lee MT, Kim Y, Comrie JMC, Bai ZS, Johnson EL, **Aydemir TB.*** Metal transporter SLC39A14/ZIP14 modulates regulation between the gut microbiome and host metabolism. Am J Physiol Gastrointest Liver Physiol. 2023 Dec 1;325(6):G593-G607. doi: 10.1152/ajpgi.00091.2023. Epub 2023 Oct 24. PubMed PMID: 37873588.
3. Mitchell SB, Hung YH, Thorn TL, Zou J, Baser F, Gulec S, Cheung C, **Aydemir TB.*** Sucrose-induced hyperglycemia dysregulates intestinal zinc metabolism and integrity: risk factors for chronic diseases. Front Nutr. 2023 Aug 11;10:1220533. doi: 10.3389/fnut.2023.1220533. PMID: 37637953; PubMed Central PMCID: PMC10450956.
4. Sun T, Wang K, Wyman B, Sudibyo H, Liu G, Beal C, Manning S, Johnson ZI, **Aydemir TB**, Tester JW, Lei XG. Supplemental dietary full-fatted and defatted Desmodesmus sp. exerted similar effects on growth performance, gut health, and excreta hydrothermal liquefaction of broiler chicks. Algal Research. 2021 54(2021);102205, ISSN 2211-9264, https://doi.org/10.1016/j.algal.2021.102205.
5. Gheller ME, Vermeylen F, Handzlik MK, Gheller BJ, Bender E, Metallo C, **Aydemir TB**, Smriga M, Thalacker-Mercer AE. Tolerance to graded dosages of histidine supplementation in healthy human adults. Am J Clin Nutr. 2020 Nov 11;112(5):1358-1367. doi: 10.1093/ajcn/nqaa210. PubMed PMID: 32766885.
6. Lin M, Colon-Perez LM, Sambo DO, Miller DR, Lebowitz JJ, Jimenez-Rondan F, Cousins RJ, Horenstein N, **Aydemir TB**, Febo M, Khoshbouei H. Mechanism of Manganese Dysregulation of Dopamine Neuronal Activity. J Neurosci. 2020 Jul 22;40(30):5871-5891. doi: 10.1523/JNEUROSCI.2830-19.2020. Epub 2020 Jun 23. PubMed PMID: 32576620; PubMed Central PMCID: PMC7380961.
7. **Aydemir TB***, Thorn TL, Ruggiero CH, Pompilus M, Febo M, Cousins RJ. Intestine-specific deletion of metal transporter Zip14 (Slc39a14) causes brain manganese overload and locomotor defects of manganism. Am J Physiol Gastrointest Liver Physiol. 2020 Apr 1;318(4):G673-G681. doi: 10.1152/ajpgi.00301.2019. Epub 2020 Jan 31. PubMed PMID: 32003605; PubMed Central PMCID: PMC7191460.

8. Kim J, **Aydemir TB**, Jimenez-Rondan FR, Ruggiero CH, Kim MH, Cousins RJ. Deletion of metal transporter Zip14 (Slc39a14) produces skeletal muscle wasting, endotoxemia, Mef2c activation and induction of miR-675 and Hspb7. Sci Rep. 2020 Mar 4;10(1):4050. doi: 10.1038/s41598-020-61059-2. PubMed PMID: 32132660; PubMed Central PMCID: PMC7055249.
9. Hendrickx G, Borra VM, Steenackers E, Yorgan TA, Hermans C, Boudin E, Waterval JJ, Jansen IDC, **Aydemir TB**, Kamerling N, Behets GJ, Plumeyer C, D'Haese PC, Busse B, Everts V, Lammens M, Mortier G, Cousins RJ, Schinke T, Stokroos RJ, Manni JJ, Van Hul W. Conditional mouse models support the role of SLC39A14 (ZIP14) in Hyperostosis Cranialis Interna and in bone homeostasis. PLoS Genet. 2018 Apr;14(4):e1007321. doi: 10.1371/journal.pgen.1007321. eCollection 2018 Apr. PubMed PMID: 29621230; PubMed Central PMCID: PMC5903675.
10. **Aydemir TB*,** Cousins RJ. The Multiple Faces of the Metal Transporter ZIP14 (SLC39A14). J Nutr. 2018 Feb 1;148(2):174-184. doi: 10.1093/jn/nxx041. Review. PubMed PMID: 29490098; PubMed Central PMCID: PMC6251594.
11. Kim MH, **Aydemir TB**, Kim J, Cousins RJ. Hepatic ZIP14-mediated zinc transport is required for adaptation to endoplasmic reticulum stress. Proc Natl Acad Sci U S A. 2017 Jul 18;114(29):E5805-E5814. doi: 10.1073/pnas.1704012114. Epub 2017 Jul 3. PubMed PMID: 28673968; PubMed Central PMCID: PMC5530682.
12. **Aydemir TB**, Kim MH, Kim J, Colon-Perez LM, Banan G, Mareci TH, Febo M, Cousins RJ. Metal Transporter Zip14 (Slc39a14) Deletion in Mice Increases Manganese Deposition and Produces Neurotoxic Signatures and Diminished Motor Activity. J Neurosci. 2017 Jun 21;37(25):5996-6006. doi: 10.1523/JNEUROSCI.0285-17.2017. Epub 2017 May 23. PubMed PMID: 28536273; PubMed Central PMCID: PMC5481939.
13. **Aydemir TB**, Troche C, Kim J, Kim MH, Teran OY, Leeuwenburgh C, Cousins RJ. Aging amplifies multiple phenotypic defects in mice with zinc transporter Zip14 (Slc39a14) deletion. Exp Gerontol. 2016 Dec 1;85:88-94. doi: 10.1016/j.exger.2016.09.013. Epub 2016 Sep 16. PubMed PMID: 27647172; PubMed Central PMCID: PMC5101137.
14. **Aydemir TB**, Troche C, Kim MH, Cousins RJ. Hepatic ZIP14-mediated Zinc Transport Contributes to Endosomal Insulin Receptor Trafficking and Glucose Metabolism. J Biol Chem. 2016 Nov 11;291(46):23939-23951. doi: 10.1074/jbc.M116.748632. Epub 2016 Oct 4. PubMed PMID: 27703010; PubMed Central PMCID: PMC5104920.
15. Kim MH, **Aydemir TB**, Cousins RJ. Dietary Zinc Regulates Apoptosis through the Phosphorylated Eukaryotic Initiation Factor 2α/Activating Transcription Factor-4/C/EBP-Homologous Protein Pathway during Pharmacologically Induced Endoplasmic Reticulum Stress in Livers of Mice. J Nutr. 2016 Nov;146(11):2180-2186. doi: 10.3945/jn.116.237495. Epub 2016 Sep 7. PubMed PMID: 27605406; PubMed Central PMCID: PMC5086795.
16. Troche C, **Aydemir TB**, Cousins RJ. Zinc transporter Slc39a14 regulates inflammatory signaling associated with hypertrophic adiposity. Am J Physiol Endocrinol Metab. 2016 Feb 15;310(4):E258-68. doi: 10.1152/ajpendo.00421.2015. Epub 2015 Dec 8. PubMed PMID: 26646099; PubMed Central PMCID: PMC4971811.
17. Lais LL, de Lima Vale SH, Xavier CA, de Araujo Silva A, **Aydemir TB**, Cousins RJ. Effect of A One-Week Balanced Diet on Expression of Genes Related to Zinc Metabolism and Inflammation in Type 2 Diabetic Patients. Clin Nutr Res. 2016 Jan;5(1):26-32. doi: 10.7762/cnr.2016.5.1.26. Epub 2016 Jan 29. PubMed PMID: 26839874; PubMed Central PMCID: PMC4731859.
18. Guthrie GJ, **Aydemir TB**, Troche C, Martin AB, Chang SM, Cousins RJ. Influence of ZIP14 (slc39A14) on intestinal zinc processing and barrier function. Am J Physiol Gastrointest Liver Physiol. 2015 Feb 1;308(3):G171-8. doi: 10.1152/ajpgi.00021.2014. Epub 2014 Nov 26. Review. PubMed PMID: 25428902; PubMed Central PMCID: PMC4312952.
19. Martin AB, **Aydemir TB**, Guthrie GJ, Samuelson DA, Chang SM, Cousins RJ. Gastric and colonic zinc transporter ZIP11 (Slc39a11) in mice responds to dietary zinc and exhibits nuclear localization. J Nutr. 2013 Dec;143(12):1882-8. doi: 10.3945/jn.113.184457. Epub 2013 Oct 2. PubMed PMID: 24089422; PubMed Central PMCID: PMC3827636.

20. **Aydemir TB**, Chang SM, Guthrie GJ, Maki AB, Ryu MS, Karabiyik A, Cousins RJ. Zinc transporter ZIP14 functions in hepatic zinc, iron and glucose homeostasis during the innate immune response (endotoxemia). PLoS One. 2012;7(10):e48679. doi: 10.1371/journal.pone.0048679. Epub 2012 Oct 24. PubMed PMID: 23110240; PubMed Central PMCID: PMC3480510.
21. **Aydemir TB**, Sitren HS, Cousins RJ. The zinc transporter Zip14 influences c-Met phosphorylation and hepatocyte proliferation during liver regeneration in mice. Gastroenterology. 2012 Jun;142(7):1536-46.e5. doi: 10.1053/j.gastro.2012.02.046. Epub 2012 Feb 25. PubMed PMID: 22374166; PubMed Central PMCID: PMC3635537.
22. Ryu MS, Guthrie GJ, Maki AB, **Aydemir TB**, Cousins RJ. Proteomic analysis shows the upregulation of erythrocyte dematin in zinc-restricted human subjects. Am J Clin Nutr. 2012 May;95(5):1096-102. doi: 10.3945/ajcn.111.032862. Epub 2012 Mar 28. PubMed PMID: 22456662; PubMed Central PMCID: PMC3325834.
23. Cousins RJ, **Aydemir TB**, Lichten LA. Plenary Lecture 2: Transcription factors, regulatory elements and nutrient-gene communication. Proc Nutr Soc. 2010 Feb;69(1):91-4. doi: 10.1017/S0029665109991790. Epub 2009 Dec 8. Review. PubMed PMID: 19968906; PubMed Central PMCID: PMC3790273.
24. **Aydemir TB**, Liuzzi JP, McClellan S, Cousins RJ. Zinc transporter ZIP8 (SLC39A8) and zinc influence IFN-gamma expression in activated human T cells. J Leukoc Biol. 2009 Aug;86(2):337-48. doi: 10.1189/jlb.1208759. Epub 2009 Apr 28. PubMed PMID: 19401385; PubMed Central PMCID: PMC2726764.
25. **Aydemir TB**, Blanchard RK, Cousins RJ. Zinc supplementation of young men alters metallothionein, zinc transporter, and cytokine gene expression in leukocyte populations. Proc Natl Acad Sci U S A. 2006 Feb 7;103(6):1699-704. doi: 10.1073/pnas.0510407103. Epub 2006 Jan 24. PubMed PMID: 16434472; PubMed Central PMCID: PMC1413653.
26. Liuzzi JP, Lichten LA, Rivera S, Blanchard RK, **Aydemir TB**, Knutson MD, Ganz T, Cousins RJ. Interleukin-6 regulates the zinc transporter Zip14 in liver and contributes to the hypozincemia of the acute-phase response. Proc Natl Acad Sci U S A. 2005 May 10;102(19):6843-8. doi: 10.1073/pnas.0502257102. Epub 2005 Apr 29. PubMed PMID: 15863613; PubMed Central PMCID: PMC1100791.
27. Pai SB, Bozdayi AM, Pai RB, **Beker T**, Sarioglu M, Turkyilmaz AR, Grier J, Yurdaydin C, Schinazi RF. Emergence of a novel mutation in the FLLA region of hepatitis B virus during lamivudine therapy. Antimicrob Agents Chemother. 2005 Jul;49(7):2618-24. doi: 10.1128/AAC.49.7.2618-2624.2005. PubMed PMID: 15980328; PubMed Central PMCID: PMC1168680.
28. Pai SB, Pai RB, Xie MY, **Beker T**, Shi J, Tharnish PM, Chu CK, Schinazi RF. Characterization of hepatitis B virus inhibition by novel 2'-fluoro-2',3'-unsaturated beta-D- and L-nucleosides. Antivir Chem Chemother. 2005;16(3):183-92. doi: 10.1177/095632020501600304. PubMed PMID: 16004081.

Chapters:

1. Ryu MS, **Aydemir TB**. 2020. Chapter 23. Zinc. Present Knowledge in Nutrition: Basic Nutrition and Metabolism, Eleventh Edition. Elsevier
2. Grider A, **Aydemir TB**. 2024. Chapter 35. Zinc, Copper, and Manganese. Biochemical, Physiological, and Molecular Aspects of Human Nutrition, Fifth edition. Elsevier