Renee C. Geck, PhD

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Education

Harvard University, Boston, MA. 2020.
PhD, Biological and Biomedical Sciences.

George Fox University, Newberg, OR**.** 2014.
BS, Cell & Molecular Biology; minors: Chemistry and Mathematics; *summa cum laude*

Professional experience

Assistant Professor. Department of Biology, Gonzaga University. 2024-present.

Postdoctoral Scholar, Dunham Lab. Department of Genome Sciences, University of Washington. 2020-2024.

Adjunct Faculty. Department of Biology, Emmanuel College. 2018-2020.

Honors

UW Genome Sciences Department Outstanding Service Award. 2024.

Research

Peer-reviewed publications

([†] undergraduate mentee, [§] corresponding, * equal contribution)

Google Scholar profile: https://scholar.google.com/citations?authuser=1&user=0dtpSEQAAAAJ

[§]Powell NR, [§]**Geck RC**, Lai D, Shugg T, Skaar TC, Dunham MJ. (2024). Functional analysis of G6PD variants associated with low G6PD activity in the All of Us Research Program. *Genetics, 228*(4): iyae170.

Boyle GE, Sitko K, Galloway JG, Haddox HK, Bianchi AH, Dixon A, Wheelock MK, Vandi AJ, Wang ZR, Thomson RES, Garge RK, Rettie AE, Rubin AF, **Geck RC**, Gillam EMJ, DeWitt WS, Matsen FA, Fowler DM. (2024). Deep mutational scanning of CYP2C19 in human cells reveals a substrate specificity-abundance tradeoff. *Genetics, 228*(3): iyae156.

Geck RC, [†]Moresi NG, Anderson LM, yEvo Students, Brewer R, Renz TR, Taylor MB, Dunham MJ. (2024). Experimental evolution of *S. cerevisiae* for caffeine tolerance alters multidrug resistance and target of rapamycin signaling pathways. *G3*, *14*(9): jkae148.

Taylor MB, Warwick AR, Skophammer R, Boyer JM, **Geck RC**, Gunkelman K, Walson M, Rowley PA, Dunham MJ. (2024). yEvo: a modular eukaryotic genetics and evolution research experience for high school students. *Ecol Evol, 14:*e10811.

Garge RK, **Geck RC**, Armstrong JO, Dunn B, Boutz DR, Battenhouse A, Leutert M, Dang V, Jiang P, Kwiatkowski D, Peiser T, McElroy H, Marcotte EM, Dunham MJ. (2023). Systematic Profiling of Ale Yeast Protein Dynamics across Fermentation and Repitching. *G3*, *14*(3): jkad293.

[†]Moresi NG, **Geck RC**, Skophammer R, Godin D, yEvo Students, Taylor MB, Dunham MJ. (2023). Caffeine-tolerant mutations selected through an at-home yeast experimental evolution teaching lab. *microPubl Biol*: 10.17912/micropub.biology.000749.

Geck RC, Powell NR, Dunham MJ. (2023). Functional interpretation, cataloging, and analysis of 1,341 glucose-6-phosphate dehydrogenase variants. *Am J Hum Genet, 11*(2):228-239.

Peluffo G, Stevens LE, Qiu X, Temko D, Fassl A, Li Z, Trinh A, Seehawer M, Jovanović B, Alečković M, Wilde CM, **Geck RC**, Shu S, Kingston NL, Harper NW, Almendro V, Pyke AL, Egri SB, Papanastasiou M, Clement K, Zhou N, Walker S, Salas J, Park SY, Frank DA, Meissner A, Jaffe JD, Sicinski P, Toker A, Michor F, Long HW, Overmoyer BA, Polyak K. (2022). JAK-STAT signaling in inflammatory

breast cancer enables chemotherapy-resistant cell states. *Canc Res,* CAN-22-0423.

Taylor MB, Skophammer R, Warwick AR, Boyer JM, **Geck RC**, yEvo Students, Walson M, Large CRL, Hickey ASM, Rowley PA, Dunham MJ. (2022). yEvo: Experimental evolution in high school classrooms selects for novel mutations and epistatic interactions that impact clotrimazole resistance in *S. cerevisiae*. *G3, 12*(11): jkac246.

*Dibble CC, *Barritt SA, Perry GE, Lien EC, **Geck RC**, DuBois-Coyne SE, Bartree D, Zengeya TT, Cohen EB, Yuan M, Hopkins BD, Meier JL, Clohessy JG, Asara JM, Cantley LC, Toker A. (2022). PI3K drives the de novo synthesis of coenzyme A from vitamin B5. *Nature, 608*: 192–198.

Geck RC, Boyle G, Amorosi CA, Fowler DM, Dunham MJ. (2022). Measuring pharmacogene variant function at scale using multiplexed assays. *Annu Rev Pharmacol Toxicol, 62.*

Li Y, Qiu X, Wang X, Liu H, **Geck RC**, Tewari AK, Xiao T, Font-Tello A, Lim K, Jones K, Vadhi R, Kao P, Jaber A, Yerrum S, Xie Y, Chow K, Cejas P, Nguyen Q, Long HW, Liu XS, Toker A, Brown M. (2021). FGFR inhibitor mediated dismissal of SWI/SNF complexes from YAP-dependent enhancers induces adaptive resistance. *Nat Cell Biol, 23*(11): 1187-98.

Cohen EB, **Geck RC**, Toker A. (2020). Metabolic pathway alterations in microvascular endothelial cells in response to hypoxia. *PLOS One,* 0232072.

Geck RC, Coblenz C, Rofelty A, Schmitt JM. (2020). CaM Kinase I Regulation of p53 in Breast Cancer Cells. *J Adv Mol Biol, 4*(2): 7-23.

Liu H, Paddock MN, Wang H, Murphy CJ, **Geck RC**, Navarro AJ, Wulf GM, Elemento O, Haucke V, Cantley LC, Toker A. (2020). The INPP4B Tumor Suppressor Modulates EGFR Trafficking and Promotes Triple Negative Breast Cancer. *Canc Discov,* 2159-8290.CD-19-1262.

Geck RC, Foley JR, Murray Stewart TR, Asara JM, Casero RA, Toker A. (2020). Inhibition of the polyamine synthesis enzyme ornithine decarboxylase sensitizes triple-negative breast cancer cells to cytotoxic chemotherapy. *J Biol Chem, 295*(19): 6263-77.

Lien EC, Ghisolfi L, **Geck RC**, Asara JM, Toker A. (2017). Oncogenic PI3K promotes methionine dependency in breast cancer cells through the cystine-glutamate antiporter xCT. *Sci Signal, 10*(510).

Geck RC, Toker A. (2016). Nonessential amino acid metabolism in breast cancer. *Adv Biol Regul 62*: 11-17.

Schmitt JM, Magill J, Ankeny A, **Geck R**, Milligan J, McFarland H, Rice E. (2017). Estrogen Activation of CaM Kinases and Transcription is Blocked by Vitamin D in MCF-7 Breast Cancer Cells. *J Adv Mol Biol, 1*(3): 129-147.

Preprints and other scholarly work

Geck RC. Exploiting amino acid catabolism as a metabolic vulnerability in breast cancer. Thesis.

Funded grants and awards

Gonzaga-Murdock Start Up. 2024-2027, $98,850.

DeLill Nasser Award for Professional Development in Genetics. Fall 2023, $1,000.

UW Genome Sciences Parker Travel Award. 2023, $1,500.

Principal Investigator, NIH/NIGMS F32 Postdoctoral Individual National Research Service Award. 2021-2023, $133,576.

Principal Investigator, Momental Foundation Unfettered Research Grant. 2022, $10,000.

Trainee, NIH/NHGRI University of Washington Genome Training Grant. 2020-2021.

Principal Investigator, NIH/NCI F31 Predoctoral Individual National Research Service Award. 2017-2020, $106,521.

P.E.O. (Philanthropic Educational Organization) Scholar Award. 2019, $15,000.

Talks (‖ invited)

‖**Geck RC.** 2024. Improving interpretation of G6PD variation through multiplexed functional assessment. St. Jude Department of Pharmacy and Pharmaceutical Sciences seminar, online.

Pacific Northwest Yeast Club. 2024. **Geck RC**, session moderator. Fred Hutch Cancer Center, Seattle, WA.

‖**Geck RC.** 2024. Functional characterization of human *G6PD* variants using a multiplexed assay in *S. cerevisiae.* UW Center for Synthetic Biology Spring Symposium, Seattle, WA.

Geck RC. 2024. Functional characterization of human *G6PD* variants using a multiplexed assay in *S. cerevisiae.* The Allied Genetics Conference, Metro Washington DC.

CUREs and BREWMOR. 2024. **Geck RC**, moderator. The Allied Genetics Conference, online.

‖**Geck RC.** 2023. Improving interpretation of glucose-6-phosphate dehydrogenase variation. Rising Stars in Genetics and Genomics, University of Utah, Salt Lake City, UT.

‖**Geck RC.** 2023. Improving interpretation of glucose-6-phosphate dehydrogenase variation. Biology department seminar, Western Washington University, Bellingham, WA.

Geck RC. 2023. yEvo: Resources for evolving yeast in the classroom and at home. Global Community Bio Summit, online.

‖**Geck RC.** 2022. Interpreting genetic variants of G6PD for precision medicine. Molecular Biosciences Symposium, Western Washington University, Bellingham, WA.

Geck RC. 2022. Implementation of yEvo: A university-high school collaboration to evolve caffeine-tolerant yeast. bigBREW (Bridging Research and Education Workshop), online.

Geck RC. 2022. High throughput testing of pharmacogene variants using yeast activity assays. International Specialised Symposium on Yeasts, Vancouver, BC.

Geck RC. 2019. Polyamine Synthesis is a Metabolic Vulnerability in TNBC. Gordon Research Conference on Polyamines, Waterville Valley, NH.

Posters (‖ presenter)

Powell NP**, Geck RC**, Lai D, Shugg T, Skaar T, Dunham MJ. 2024. Functional analysis of *G6PD* variants associated with low G6PD activity in the All of Us Research Program. ASCPT, Colorado Springs, CO.

Moran S, **Geck R,** Fayer S, Donnelly RS, Relling M, Vulliamy T, Caudle K, Waddell A, Kendall E, Domingo G, Minucci A, Ley B, Chu C, Haidar C, McLeod H, Prchal J, Sirdah M, Aggarwal V, Jiang W, Kyle E, Weaver M, Whirl-Carrillo M, Stergachis A. 2024. ClinGen G6PD Variant Curation Expert Panel: Addressing the need for genetic variant classification in G6PD deficiency. ACMG, Toronto, ON.

Carroll K, Bailey D, Chen WJ, Coleman S, Delventhal R, **Geck RC**, Goetsch P, Keeney J, Law M, Lo T, Perry K, Rich A, Steinhauer J, Taylor MB, Voisine C. 2024. BREWMOR: Bridging Research and Education with Model ORganisms. TAGC24, Metro Washington, DC.

‖**Geck RC**, Powell NP, Walker MN, Dunham MJ. 2023. Improving G6PD variant interpretation through multiplexed functional assessment. ASHG, Washington, DC.

Powell NP**, Geck RC**, Lai D, Skaar T, Dunham MJ. 2023. Evaluation of G6PD Genotype vs. Activity in All of Us. ASCPT, Atlanta, GA.

‖**Geck RC,** Walker MN, Dunham MJ. 2022. Improving G6PD variant classification through multiplexed functional assessment. Mutational Scanning Symposium, Toronto, ON.

‖**Geck RC,** Walker MN, Dunham MJ. 2022. Improving G6PD variant classification through systematic review and functional assessment. CPIC-PGRN Meeting, Aurora, CO.

‖**Geck RC,** Walker MN, Boyle G, Fowler DM, Dunham MJ. 2021. Functional assessment of thousands of G6PD variants. PGRN-ASHG Symposium, online.

‖**Geck RC**. 2021. Functional interpretation of human G6PD variants using multiplexed analyses in *S. cerevisiae.* NHGRI Research Training and Career Development Meeting, online.

Press coverage and features

Anazonwu, D. 2024. Beer brewers and geneticists collaborate on study of yeast changes during commercial fermentation. *Genes to Genomes*.

Martin MO, Schmidt M, Swanson M, Levin P, Racaniello V. 2023. At-home Evolution With Yeast. *This Week in Microbiology* podcast, episode 282, from the American Society for Microbiology.

NIH. 2023. Discovering More Genetic Variants Thanks to *All of Us* Data. *All of Us* Research Highlights.

Spencer K. 2023. Inside AJHG: A Chat with Renee Geck. *AJHG 11*(2).

Sweeny C. 2020. Targeting the polyamine pathway—"a means" to overcome chemoresistance in triple-negative breast cancer. *J Biol Chem, 295*(19).

Teaching

Courses (‖ designed)

Gonzaga University, Spokane, WA

Information Flow in Biological Systems (BIOL 105). F 2024, S 2025.

Genetics (BIOL 207). S 2025.

Genetics Lab (BIOL 207L). S 2025.

Molecular Biology (BIOL 456). F 2024.

‖Molecular Biology Lab (BIOL 456L). F 2024.

University of Washington, Seattle, WA

‖Biology, Technology, and Ethics of Personalized Medicine. (BIOL485A). W 2023 with Nguyen T, Tatapudy S.

Emmanuel College, Boston, MA

Human Biology (BIOL 1103). Sp 2019.

Microbiology Lab (BIOL L3127). Sp 2020.

Life on Earth Lab (BIOL L1101). F 2018, F 2019.

Undergraduates mentored

Gonzaga University, Spokane, WA

Howlett A. 2025-present.

Manson K. 2025-present.

Ohlson-Kiehn S. 2025-present.

University of Washington, Seattle, WA

Maggi V. 2022-2023. Azole Drug Resistance and Fitness in Yeast: A Collaboration with High School Classrooms.

Moresi NM. 2021-2022. yEvo Lab: A University-High School Collaboration to Evolve Caffeine Tolerance in Yeast. *Awarded best undergraduate poster at Yeast Genetics Meeting 2022.*

Walker MN. 2021. Haplotype modifies variant function in *G6PD*.

Additional training and workshops

GSA Journals Peer Review Training Program, 2024.

Columbia University SHARP Training in PI Leadership Skills, 2023.

Cold Spring Harbor Laboratory Programming for Biology course, 2019.

Service

Professional

Reviewer: G3 (2022, 2024), Genetics (2024), Molecular Biology and Evolution (2023), PLOS Biology (2023).

Curator: ClinGen G6PD Variant Curation Expert Panel. 2022-present. Working with other experts to create *G6PD*-specific variant interpretation guidelines and evaluate evidence for interpretation.

Steering Committee Member: Bridging Research & Education with Model Organisms (BREWMOR). 2022-present. Network of faculty dedicated to increasing experiential learning for biology undergraduates.

Co-organizer of "CUREs and BREWMOR" online event for TAGC24 (2024).

Co-organizer of microBREW "Assessment of Undergraduate Experiential Learning in Biology Labs" (2025).

Member: Atlas of Variant Effects Alliance. 2022-present. International group assessing the effects of all the possible variants of human genes in the genome. *Contributing to course development, 2024-present.*

Community and outreach

yEvo (yeast Evolution) Lab. 2020-present. Work with high school educators to implement a yeast evolution authentic research lab. Contribute to curriculum development and resources at yEvo.org.

Gonzaga University

Member: Biology Curriculum Committee. 2024-present.

University of Washington

Board member: Community Organizers of Genome Sciences. 2023-2024.

Board member: Women in Genome Sciences. 2020-2023. President 2022-2023.

Coordinator: Genome Sciences Journal Club. W 2022.

Postdoc Representative: Genome Sciences Curriculum Committee. 2021-2022.

Memberships

Genetics Society of America (GSA), 2023-present.

Pharmacogenomics Research Network (PGRN), 2020-present.

American Society of Human Genetics (ASHG), 2023.