

PROMOTION RECOMMENDATION
The University of Michigan
School of Public Health

Justin A. Colacino, assistant professor of environmental health sciences, Department of Environmental Health Sciences and assistant professor of nutrition, Department of Nutrition, School of Public Health, is recommended for promotion to associate professor of environmental health sciences, with tenure, Department of Environmental Health Sciences, and associate professor of nutrition, without tenure, Department of Nutrition, School of Public Health.

Academic Degrees:

Ph.D.	2014	University of Michigan
M.S.	2014	University of Michigan
M.P.H.	2009	University of Texas, Dallas
B.S.	2005	University of Texas, Austin

Professional Record:

2019-Present	Co-Director for Career Development, University of Michigan Lifestage Environmental Exposures and Disease Core Center
2018-Present	Faculty Affiliate, University of Michigan Center for Computational Medicine and Bioinformatics
2017-Present	Member, University of Michigan Green Life Sciences Initiative Assistant
2016-Present	Professor, Department of Nutritional Sciences, University of Michigan School of Public Health
2016-Present	Assistant Professor, Department of Environmental Health Sciences, University of Michigan School of Public Health
2015-Present	Member, University of Michigan Lifestage Environmental Exposures and Disease Core Center
2015	Research Assistant Professor, Department of Nutritional Sciences, University of Michigan School of Public Health

Summary of Evaluation:

Teaching – Professor Colacino has been the lead or co-lead instructor for five university courses. Three of these are required classes (EHS 602 Essentials of Toxicology, PUBHLTH 610 Introduction to Public Health, and EHS 628 Toxicology Research, Analysis, and Presentation). Two of these are small ($n \leq 8$) elective courses (NUTR 657 Nutrition, the Environment, and Cancer and ENVIRON 310 Environmental Chemicals and Disease). He has revised the curriculum of EHS 602 Essentials of Toxicology to include risk assessment and applied toxicology. This course is now one of the best reviewed courses of its size at the School of Public Health. His teaching scores are excellent, 4.19 to 4.97 in large classes and 4.75 to 5 in the small seminars. In addition, he teaches annually in the University of Michigan Comprehensive Industrial Hygiene Review short course and has served as a group instructor in Genomics for the

University of Michigan Big Data Summer Institute. In 2017, Professor Colacino was nominated by students for the “Golden Apple Award” for his teaching of EHS 602. Professor Colacino has been or is the chair or co-chair of seven dissertation committees (one of whom has graduated) and six masters student thesis committees, and has been or is a member of 20 other doctoral and masters student thesis committees. His doctoral and master’s students have won highly competitive awards at the Society of Toxicology and Gordon Research Conference regional and international meetings and this year one of his doctoral students was inducted into the Bouchet Graduate Honors Society.

Research – The focus of Professor Colacino’s research has centered on studies to understand the mechanisms through which environmental and dietary factors interact in susceptible tissues to influence cancer risks. Many common cancers such as breast cancer have been shown to include environmental factors in their etiologic determinants, including the chemicals found in our everyday environment, and that a major point of interaction in healthy tissues that could lead to the onset of cancer involves the dysregulation of specific stem or progenitor cell populations. Professor Colacino has made substantial contributions to identifying the mechanisms driving the chemical dysregulation of stem cells are poorly understood as are the enhanced susceptibilities due to factors such as parity, race, and health status (e.g. obesity). His innovative use of multiple model systems (e.g. 3D organoids in vitro, computational, and population) and new technologies (e.g. single cell transcriptomics) are highly significant for the field of environmental health sciences. He has also established himself as a leader in bioinformatic and statistical analysis of large datasets, including genomic, toxicological, and epidemiological datasets, setting him apart from other investigators in the field.

Professor Colacino has an R01 under the National Institute of Environmental Health Sciences’ (NIEHS) prestigious Outstanding New Environmental Scientist (ONES) program. He serves as the co-leader of career development within the Michigan Lifestage Environmental Exposures and Disease (M-LEEaD) P30 NIEHS Core Center of Excellence. Professor Colacino also serves as a co-investigator on the TaRGET II U01 consortium grant and the Revolutionizing Innovative Visionary Environmental Research (RIVER) R35 program, both from NIEHS. Professor Colacino and five other co-PI’s from three different University of Michigan schools were recently awarded \$7 million from the University of Michigan Biosciences Initiative and the Provost’s Office to establish a “Single Cell Spatial Analysis Program.” Professor Colacino has 68 peer-reviewed publications. He has 36 publications since his appointment to the rank of assistant professor including two as first, nine as last, and six as second author. Google Scholar reports 1988 citations and an h-index of 26 since 2015. His publications have appeared in leading journals including *Environmental Health Perspectives* and *Nature Communications*. His work has been highly cited, and has been specifically highlighted in commentaries and reviews. Since becoming an assistant professor, he has been invited to present at the prestigious Gordon Research Conference in Cellular and Molecular Mechanisms of Toxicity and at the American Association for Cancer Research annual meeting. He has also published three commentaries and was senior author of a book chapter. He has also engaged in communicating science to various stakeholders and received significant press coverage for his research.

Recent and Significant Publications:

- Nguyen, V., Kahana, A., Heidt, J., Polemi, K., Kvasnicka, J., Jolliet, O., Colacino, J.A. (2020). A comprehensive analysis of racial disparities in chemical biomarker concentrations in United States women, 1999-2014. *Environment International*. 137. doi:10.1016/j.envint.2020.105496.
- Rocco, S.A., Koneva, L., Middleton, L.Y.M., Thong, T., Solanki, S., Karram, S., Nambunmee, K., Harris, C., Rozek, L.S., Sartor, M.A., Shah, Y.M., Colacino, J.A. (2018). Cadmium exposure inhibits branching morphogenesis and causes alterations consistent with HIF-1 α inhibition in human primary breast organoids. *Toxicological Sciences*. 164(2) 592-602.
- Colacino, J.A., Azizi, E., Brooks, M.D., Harouaka, R., Fouladdel, S., McDermott, S., Lee, M., Hill, D., Madden, J., Boerner, J., Cote, M.L., Sartor, M.A., Rozek, L.S., Wicha, M.S. (2018). Heterogeneity of normal human breast stem and progenitor cells as revealed by transcriptional profiling. *Stem Cell Reports*. 10:1596-1609.
- Thong, T., Wang, Y., Brooks, M.D., Lee, C., Scott, C., Balzano, L., Wicha, M.S., Colacino, J.A. (2020). Hybrid stem cell states: Insights into the relationship between mammary development and breast cancer using single-cell transcriptomics. *Frontiers in Cell and Developmental Biology*. 8:288.
- Dame, M.K., Attili, D., McClintock, S., Dedhia, P.H., Ouilette, P., Hardt, O., Chin, A.M., Xue, X., Laliberte, J., Katz, E.L., Newsome, G.M., Hill, D., Miller, A., Agorku, D., Altheim, C., Agorku, D., Bosio, A., Simon, B., Samuelson, L., Stoerker, J.A., Appelman, H., Varani, J., Wicha, M.S., Brenner, D.E., Shah, Y., Spence, J., Colacino, J.A. (2018). Identification, isolation, and characterization of human LGR5-positive colon adenoma cells. *Development*. 145.

Service – Professor Colacino has contributed his services extensively at all levels. At the department level, Professor Colacino has served as the graduate chair and chair of the Academic Degree Programs (M.S. and Ph.D.) Committee; on the executive committee of the Environmental Toxicology and Epidemiology Training Grant; and on the search committee for a recent department assistant professor search. At the school and university level, Professor Colacino has served as a founding member of the Junior Faculty Advisory Committee, and also serves on the School of Public Health Research Council. Externally, Professor Colacino is widely known and respected, including serving as the elected president of the Michigan Chapter of the Society of Toxicology. He has served as a grant panel reviewer for NIH and DARPA study sections and serves as an Editorial Board member of Toxicological Sciences, Cancer Research, and Epigenomes and on the Editorial Review Board of Environmental Epigenetics

External Reviewers:

Reviewer A: “I find Justin’s work to be exciting, insightful, and truly unique in both mechanistic discovery and translation to interventions... In short, Dr. Colacino is more than a complete package. He is a brilliant, innovative scientist with broad expertise, focus, and practice. His background in the statistical and molecular genetics combined with advanced translational research and a core focus on environmental justice will insure a continued strong career trajectory.”

Reviewer B: ““Single cell analysis of the effects of developmental lead (Pb) exposure on the hippocampus’ is the first comprehensive examination of the effects of metal exposures on gene

expression patterns using single-cell RNA sequencing. I consider this paper to be outstanding. ...The paper is a landmark paper for the field of scRNASeq based neurotoxicology.”

Reviewer C: “What I am most impressed by is that he is setting a new focus on how individuals differ in their responses to environmental exposure which can transform the field of molecular epidemiology. It underscores the likely possibility that, while a chemical may have negligible effects in a majority of individuals, a subset may suffer severe consequences. He has been pioneering the tools of cell culture models and high dimensional data analyses such as epigenetic profiling and single cell transcriptomics which will be essential tools for epidemiology in the 21st century.”

Reviewer D: “In summary, Dr. Colacino appears to be an outstanding researcher, teacher, mentor, and scholar. I would rank him as one of the top 5 junior level researchers in the field of toxicology and environmental health sciences across the country, particularly for his innovative contributions to epigenomics, stem cell biology, and the application of novel methods to toxicology research.”

Reviewer E: “This award [NIEHS ONES] puts him at the very top echelon of peers in the field. This award is for outstanding new investigators in environmental health sciences... His publication record, teaching portfolio, and service efforts definitely put him among the very best in his peer group.”

Reviewer F: “In short, Justin is a superstar with abundant, well cited publications, a copiousness amount of competitive research support, and an amazing quantity of service contributions to the University, department and scientific organizations while in rank as a tenure-track assistant professor.”

Reviewer G: “In sum, Dr. Colacino is a highly productive environmental scientist whose current trajectory forecasts substantial contributions in the field of environmental and cancer research.”

Reviewer H: “Based on my review of Dr. Colacino’s research, teaching, and service portfolio, I consider his accomplishments to be impressive, methodologically rigorous, and well-focused relative to others at his career stage.”

Reviewer I: “In sum, Dr. Colacino’s work bridges basic science, cancer and environmental science and he has been an international leader in advancing our understanding how environment and epigenetic marks interact. His ability to conduct basic research and to translate his science are unique and outstanding. His work in newly emerging compounds such as environmental estrogens has been particularly important in advancing both scientific and the general public’s knowledge about these emerging chemicals... This work requires expertise that crosses biology, epigenetics, health disparities and risk communication. Very few scientists can do such complex work.”

Summary of Recommendation:

Professor Colacino has established himself as a leader in bioinformatic and statistical analysis of large datasets, including genomic, toxicological, and epidemiological datasets, setting himself

apart from other investigators in the field. He has sustained a high quality of scholarly work over the course of his career and his teaching has been excellent. In addition to his strong research and teaching, Professor Colacino has demonstrated leadership within the department, school, and the professional community. It is with the support of the School of Public Health Executive Committee that we recommend Justin A. Colacino for promotion to associate professor of environmental health sciences, with tenure, Department of Environmental Health Sciences, and associate professor of nutrition, without tenure, Department of Nutrition, School of Public Health.



F. DuBois Bowman, Ph.D.
Dean, School of Public Health

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