

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Ginger V.S. Szymczak, assistant professor of chemistry, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of chemistry, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2009	University of Oregon
M.A.	2005	University of Oregon
B.A.	2004	The Evergreen State College

Professional Record:

2016-current	Assistant Professor of Chemistry, University of Michigan
2013-2016	UM Presidential Post-doctoral Fellow, Chemistry Education, University of Michigan
2010-2013	Lecturer I/Post-doctoral Teaching Fellow, Chemistry Education, University of Michigan
2009-2010	Post-doctoral Researcher, University of Southern California

Summary of Evaluation:

Teaching: Professor Szymczak has taught CHEM 210, a large gateway organic chemistry course two times. She has also taught CHEM 216, the organic chemistry lab that accompanies the second half of the introductory organic sequence, for three terms. She initiated CHEM 550 (cross-listed as EDUC 554), a graduate-level chemistry education course, and has taught it twice. Her evaluations were strong in these classes and comparable to some of the excellent cohort of teachers we have in these courses. Her colleagues reported that she has been an excellent partner in the team-taught environment of CHEM 210. Professor Szymczak revised CHEM 216 to be problem-driven rather than to follow a recipe, a notable improvement. She piloted a successful and innovative special section of 216 where students developed and studied a degradable polymer. Professor Szymczak has also been a strong mentor, with her graduate students winning prestigious fellowships, publishing prolifically, and moving on to excellent placements. She has mentored an exceptionally large number (34) of undergraduates with 13 becoming co-authors on papers.

Research: Professor Szymczak is a chemical education specialist. Chemical education research (CER) is concerned with how chemistry is learned and taught. Research topics include how students develop understanding of chemistry concepts and how teaching methods affect this learning. Professor Szymczak's research program is aimed at understanding how: (1) college-level chemistry instructors learn to teach, (2) writing contributes to conceptual learning and reasoning, and (3) disciplinary thinking in chemistry and science develops. An overarching objective is to improve teaching of chemistry. She has been extraordinarily productive with 35 papers published or submitted. Her work is supported by a strong funding portfolio including two NSF grants, one of which is a CAREER award. In one study she showed how students learn

to use spectroscopy for determining chemical structures, a project that gained widespread attention in the community. Her work with GSIs has led to suggestions for improving training, and the write-to-learn project has highlighted better ways of using writing in science education. Her strong productivity, funding, and recognition by others predict continued progress as a leader in the field.

Recent and Significant Publications:

- Connor, M.C., Glass, B.H., Finkenstaedt-Quinn, S.A., & Shultz, G.V. (2020). :Developing expertise in ¹H NMR spectral interpretation.” *Journal of Organic Chemistry*, 86(2), 1385-1395. DOI:10.1021/acs.joc.0c01398.
- Zotos, E., Moon, A., & Shultz, G.V. (2020). “Investigation of chemistry graduate teaching assistants’ teacher knowledge and teacher identity.” *Journal of Research in Science Teaching*, 57(6), 943-967. DOI:10.1002/tea.21618.
- Moon, A.M., Gere, A.R., & Shultz, G.V. (2018). “Writing in STEM: Faculty conceptions of writing and its role in the undergraduate classroom.” *Science Education*, 102(5), 1007-1028. DOI: 10.1002/sce.21454.
- Barnard, R. & Shultz, G.V. (2019). “Most important is that *they* figure out how to solve the problem: how do advisors conceptualize and develop research autonomy in chemistry doctoral students?” *Higher Education*, 79, 981-999. DOI:10.1007/s10734-019-00451-y.

Service: Professor Szymczak is an excellent campus citizen with contributions to DEI efforts and education efforts at the department and university level. Besides serving with high engagement on the DEI committee, she is one of two faculty advisors for commUNITY, a new BIPOC student group in the Chemistry department, and helps train students in bystander intervention. She was the lead organizer for the 2019 Provost’s seminar on Teaching and Learning. She also has excellent visibility in the professional community, as shown by numerous ACS committees and CER symposia.

External Reviewers:

Reviewer (A): “Dr. Shultz has an exceptional record of funding for a junior scholar in chemistry education research, which demonstrates the high quality and creativity of her research... Dr. Shultz has established herself as a rising leader in the field of chemistry education research, particularly in areas related to writing to learn in chemistry. I would say that she has one of the strongest programs amongst her peer group...”

Reviewer (B): “Professor Schultz’[s] research is of very high quality, high visibility...In comparison to her peer group, I would say that she is one [of the] top early career chemistry education research faculty.”

Reviewer (C): “There’s little question that she has built an excellent, internationally recognized, research program...She has the best record as an Assistant Professor in CER of any scholar in the past 8-10 years. I see no other scholar who is approaching the tenure decision time to be anywhere near her level of productivity, and likely long-term impact”

Reviewer (D): “My overall assessment of Dr. Schultz’s research accomplishments to date is strongly positive. She is head and shoulders above her assistant professor peers at a similar

career stage...To sum up, Dr. Schultz's three research aims are focused, have produced significant results and are promising for the future."

Reviewer (E): "Dr. Shultz's productivity is unprecedented...The creativity required to design these studies speaks to the brilliance of Dr. Shultz as a rising star...Dr. Shultz has established a compelling record of high quality research that is impressive in its scope and magnitude."

Reviewer (F): "Overall, I am deeply impressed by all aspects of [Professor Szymczak's] research and scholarly activities. Her research is focused and builds on itself in logical and coherent ways. It is evident that intention went into the selection of scalable, high-impact teaching methods."

Summary of Recommendation:

Professor Szymczak has developed an excellent program of research at the interface of chemistry and education. She has uncovered mechanisms of how college-level teachers gain and use pedagogical content knowledge and proposed methods for improved teaching as a result. She has identified how novice and expert students approach solving chemical problems, leading to insight into how to better teach new students. She has developed and implemented a novel approach to write-to-learn in STEM with potential for large scalability. Her teaching and service record indicate a committed and excellent professor with attention to DEI. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Ginger V.S. Szymczak be promoted to the rank of associate professor of chemistry, with tenure, College of Literature, Science, and the Arts.



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