

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

Pavel Nagorny, associate professor of chemistry, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of chemistry, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2007	Harvard University, Cambridge, MA
B.S.	2001	Oregon State University, Corvallis, OR

Professional Record

2017 – current	Associate Professor in Chemistry, Affiliated Faculty, Medicinal Chemistry and PCB Programs, University of Michigan
2010 – 2017	Assistant Professor in Chemistry, Affiliated Faculty, Medicinal Chemistry, University of Michigan
2007-2010	Post-doctoral Fellow, Memorial Sloan-Kettering Cancer Center, New York, NY

Summary of Evaluation:

Teaching: Since his last promotion, Professor Nagorny has taught three graduate (CHEM 541, 542, and 543) and three undergraduate courses (CHEM 215, 215H, and 420). The undergraduate courses and CHEM 542 were all new to Professor Nagorny. This is an unusually large number of different and new courses to teach over this period in a career. CHEM 215 is a high enrollment class (~300/section) and required for all chemistry majors and many other science majors as well. CHEM 420 is an exceptionally popular senior-level course with over 80 enrollees typically. This portfolio spans courses from beginning to advanced and represents core parts of our curriculum. Professor Nagorny typically receives student evaluations on par with other instructors. He consistently reaches out to CRLT to refine his teaching style. Professor Nagorny is currently mentoring seven graduate students, one post-doctoral fellow, and two undergraduates with success. Previous students have gone mostly to industrial chemistry research positions, with some taking alternative career paths. The group size and placement are in line with expectations for promotion in our department. Overall Professor Nagorny is a valued teacher due to the breadth of courses he has taught and his constant attention to improvement.

Research: Professor Nagorny is an organic chemist whose research emphasizes synthesis of natural products and development of new chemical tools for synthesis. This type of research is central to organic chemistry, providing paths to making useful molecules (e.g. drugs) and insight into how reactions work in different contexts. Achieving new or improved syntheses can have large impacts on drug discovery or chemical biology by enabling synthesis of many derivatives with potential biological activity. In his pre-tenure period, Professor Nagorny was primarily known for developing: 1) synthesis of complex steroids; and 2) chiral phosphoric acids for asymmetric catalysis. Since tenure, Professor Nagorny has expanded on his original work and opened several new lines of research. In the area of natural product synthesis, Professor

Nagorny developed concise synthesis of numerous derivatives of cardiotonic and other steroids. These molecules were then tested for anticancer activity with determination of structure activity relationships. Professor Nagorny has invented methods based on chiral phosphoric acid catalysts to synthesize a variety of glycosylated natural products with regioselectivity, with focus on macrolactones. He has also developed new catalysts for asymmetric transformations with novel selectivity. Additionally, he developed use of SF₆ to fluorinate compounds. Fluorination is commonly used in medicinal chemistry to affect bio-related properties. His strong funding and ongoing creativity suggest continued excellent productivity.

Recent and Significant Publications:

- Kim, S., Khomutnik, Y., Bannykh, A., & Nagorny, P. (2021). Synthesis of glycosyl fluorides by photochemical fluorination with sulfur (VI) hexafluoride. *Organic Letters*, 23(1), 190-194.
- Khatri, H. R., Bhattarai, B., Kaplan, W., Li, Z., Long, M. J. C., Aye, Y., & Nagorny, P. (2019.) Modular total synthesis and cell-based anticancer activity evaluation of ouabagenin and other cardiotonic steroids with varying degrees of oxygenation. *Journal of the American Chemical Society*, 141(12), 4849-4860.
- Arguelles, A. J., Sun, S., Budaitis, B. G., & Nagorny, P. (2018.) Design, synthesis and application of chiral C₂-symmetric spiroketal-containing ligands in transition metal catalysis. *Angewandte Chemie*, 130(19), 5423-5427.
- Tay, J.-H., Arguelles, A. J., DeMars, M., Zimmerman, P. M., Sherman, D. H., & Nagorny, P. (2017.) Regiodivergent glycosylations of 6-deoxy-erythronolide B and oleandomycin-derived macrolactones enabled by chiral acid catalysis. *Journal of the American Chemical Society*, 139(25), 8570-8578.

Service: Professor Nagorny chaired the Chemistry Graduate Recruiting Committee for three years with a focus on activities to promote a diverse graduate student applicant pool. These activities had to be altered because of the pandemic; nevertheless, they proceeded with success under his leadership. His national service includes running a carbohydrate conference with about 100-200 attendees. He took advantage of the pandemic restrictions to use an online format and invite an international slate of speakers to this regional meeting, which added vitality to the scientific program.

External Reviewers:

Reviewer (A): “Over the past decade Professor Nagorny has established a productive and highly creative program that is focused on the development of new synthetic methodology and strategies for complex molecules synthesis...In my view his publications showcase the best practices in the field and help define excellent standards in reporting. Thus, I see him at the top of his peer group and I look forward to continuing to follow and support his program.”

Reviewer (B): “Prof. Pavel Nagorny has made important scientific contributions to the field of organocatalysis and his program has evolved in the last 5 years to include exciting new collaborative efforts in chemical biology and drug discovery.”

Reviewer (C): “[Professor Nagorny] is an innovative synthetic chemist and a leader in cardiolide and carbohydrate synthesis. He has been highly productive with many publications appearing in top tier journals.”


Reviewer (D): “I have found Dr. Nagorny’s research program to be robust, and I have high regard for his intellect and scholarship. I believe that he is an excellent scientist and worthy of a promotion to Professor.”

Reviewer (E): “...a hallmark of publications from the Nagorny laboratory is their high quality and thoroughness...[the paper] on the synthesis and evaluation of the anticancer activity of ouabagenin and other cardiac glycosides is an ever more impressive piece of work...”

Reviewer (F): “Professor Nagorny’s 2019 publication in J. Am. Chem. Soc., ‘Modular Total Synthesis and Cell-Based Anticancer Evaluation of Oubagenin...,’ is terrific. It addresses a challenging synthetic target, includes lots of innovative transformations, and is based on a scholarly analysis of the relevant class of natural products.”

Summary of Recommendation:

Professor Nagorny’s research in synthesis and development of synthetic tools has high interest for chemists and application to fields such as drug development. His teaching is characterized by continued improvement and spans a broad portfolio of courses. He is a fine university citizen with attention to DEI. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Pavel Nagorny be promoted to the rank of professor of chemistry, with tenure, College of Literature, Science, and the Arts.



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