

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

Andrzej T. Wierzbicki, associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2003	University of Warsaw, Poland
M.Sc.	2000	University of Warsaw, Poland

Professional Record:

2016 – 2017	Visiting Professor, International Institute of Molecular Cell Biology, Warsaw
2015 – present	Associate Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2009 - 2015	Assistant Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2005 – 2009	Post-doctoral Research Associate, Washington University, St. Louis
2003 – 2005	Research Assistant, University of Warsaw, Poland

Summary of Evaluation:

Teaching – Professor Wierzbicki’s record of teaching and mentoring was considered very strong. His service course “Biology 305 – Genetics” is considered one of the more demanding courses to teach in the MCDB curriculum because of its large enrollment (300-400 students/term) and complexity of material the students are asked to learn. Professor Wierzbicki’s E&E scores are commendable, in the middle of the range of the other Bio 305 instructors. His specialty course “MCDB 462 – Epigenetics” is a very popular literature-based course. Several letters from undergraduate students who took MCDB 462 spoke to the impact this course had on their understanding of molecular biology. Letters from his graduate and post-doctorate trainees emphasized that Professor Wierzbicki fosters a supportive environment in the laboratory. It is worth noting that two of Professor Wierzbicki’s former trainees are currently heading their own research programs. Overall, the MCDB professors consider him to be a talented educator who significantly benefits MCDB’s educational mission.

Research – The majority of Professor Wierzbicki’s research program has been focused on a process termed RNA-mediated DNA methylation (RdRM). In this process, the production of long non-coding RNAs (lncRNAs) at genetic loci leads to the nearby DNA becoming methylated, which inhibits gene expression. In many organisms, this is a major form of defense against transposons, pieces of DNA that can replicate and spread throughout genomes. RdRM can be viewed as a cell’s defense against transposons, although it also plays a role in the repression of cellular genes, including genes controlling human cancer. Using the simple plant *Arabidopsis thaliana* as a model, Professor Wierzbicki’s group has made several important

discoveries concerning RdRM, e.g., demonstrating how it influences the structure of chromatin around targeted transposons. In addition to this work, Professor Wierzbicki has initiated a characterization of the chloroplast genome. Chloroplasts, the organelles in plants that carry out photosynthesis, have retained many ancestral genes in their genome that are critical for their function; however, little is known about how this organelle's genome is packaged into chromatin. The available data indicates that chloroplast DNA is packaged in a way that is distinct from bacterial genomes and nuclear chromatin. Professor Wierzbicki's expertise in studying the RdRM at the genomic level has positioned him to become the leader in the emerging area of organelle-derived chromatin structure.

#### Recent and Significant Publications:

Kuciński J, Kmera A, Rowley MJ, Khurana P, Nowotny M, Wierzbicki AT. Functional characterization of RNase H1 proteins in *Arabidopsis thaliana*. In revision bioRxiv: <https://doi.org/10.1101/662080>.

Tsuzuki M, Wierzbicki AT (2018) Buried in PEAT-discovery of a new silencing complex with opposing activities. *EMBO J.* 37:e100573.

Kucinski J, Wierzbicki AT (2017) Long-Range Control of Gene Expression via RNA-directed DNA Methylation. *PLoS Genet.* 3:e1006749.

Service – Professor Wierzbicki's has performed several important duties for the department, most notably chairing the committee that oversees the Plant Growth Facility in the Biological Sciences Building (BSB). This service was emphatically commented on by members of the plant research faculty at the meeting as being essential to the success of the facility. Others commented about Professor Wierzbicki's ability to listen to opposing views during difficult decision-making discussions in other committees. Extramurally, he has served on National NSF grant panels, and he has co-organized a long running meeting on non-canonical RNA polymerases.

#### External Reviewers:

##### Reviewer (A)

"I am pleased to write in enthusiastic support of Dr. Andrzej Wierzbicki's promotion on the grounds that he has: made an important contribution to plant molecular biology; a continuing stream of publications that advance the field; a good record of community service mainly through peer review and makes a strong contribution through teaching."

##### Reviewer (B)

"I am particularly impressed with the recently established new research direction that aims at understanding the chromatin organization/structure of the chloroplast genome(s). It is clear that Dr. Wierzbicki has identified an important research area in which many questions remain outstanding. I believe that Dr. Wierzbicki is one of the most talented scientists [in his cohort] in the plant epigenetics field, and I have no doubt that he will continue to excel."

Reviewer (C)

“I am very impressed by his outstanding track record and I think that he has become a leader in the field of plant epigenetics and chromatin biology. Dr. Wierzbicki has made significant contributions to the RNA-directed DNA methylation pathway since the very beginning of his career. ... Although it was technically challenging, Dr. Wierzbicki’s lab was the first to identify PolV transcripts throughout the genome and discovered that these non-coding transcripts are transcribed from both DNA strands of the silenced region, and are not controlled by cis-acting regulatory elements.”

Reviewer (D)

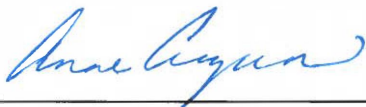
“...his future projects, as described in Andrzej’s research statement, are exciting, novel, solid, and well designed. He will continue to pursue the specificity of heterochromatin formation and the role of long non-coding RNA, a field with lots of open questions where his expertise and the material generated in his lab are unique. I am equally excited about his new line of research, addressing packing, accessibility, and dynamic regulation of the organellar genomes. This is an original, under-investigated area where breakthrough findings are almost guaranteed.”

Reviewer (E)

“...as an independent investigator, Dr. Wierzbick has made important contribution to our understanding of RNA-dependent DNA methylation (RdDM) and the role of conserved small RNA pathways in genome defense in plants. ... He has published in top journals in these areas and is an internationally recognized leader in the field. His standing in the field is evidenced by numerous talks in national and international conferences and seminar series over the past few years.”

Summary of Recommendation:

Professor Wierzbicki has developed a powerful research agenda. He has trained a large number of undergraduate students in independent research, and he has made valuable contributions to service at the departmental and university levels. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Andrzej T. Wierzbicki be promoted to professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.



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Anne Curzan, Dean  
Geneva Smitherman Collegiate Professor of  
English Language and Literature, Linguistics,  
and Education  
Arthur F. Thurnau Professor  
College of Literature, Science, and the Arts

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