

Curriculum Vitae
Professor Virginia Walbot

Education

A.B. with Distinction & Honors in Biology, Stanford University, 1967
M. Phil. in Biology, Yale University, 1969
Ph.D. in Biology, Yale University, 1972 Mentor: Ian Sussex
NIH Postdoctoral Fellow, Department of Biochemistry, University of Georgia, 1972-1975 Mentor
Leon S. Dure III

Positions Held

Assistant then Associate Professor of Biology, Washington University, St. Louis, Missouri,
1975 - 1980
Adjunct Associate Professor of Agronomy, University of Missouri, Columbia, Missouri, 1979 -
1990
Associate then Full Professor, Department of Biology, Stanford University, 1981 - present
Affiliated Faculty Member, Woods Institute, Stanford 9/1/2009 – present
Honorary Adjunct Staff Scientist at the Carnegie Institution of Science, Stanford 3/2016 --
present

Fellowships and Honors

National Science Foundation Predoctoral Fellow, 1969-1972
National Institutes of Health Postdoctoral Fellow, 1972-1975
Elected Fellow, 1981, American Association for the Advancement of Science
Belk Award, 1985, Miami University of Ohio
Lamb Award, 1985, University of Nebraska
Guggenheim Fellow and Visiting Scientist, C.S.I.R.O., Canberra, Australia, 1987
Eppley Award, 1993
National Geographic Exploration Award, 1998
Joan V. Wood Lectureship, Indiana University, 1999
Hageman Lectureship, Kansas State University, 2001
Elected corresponding member Mexican Academy of Sciences (AMC), first foreign woman
2004

Teaching

I teach plant genetics so that it fulfills the Writing in Major requirement for biology majors. There are short weekly writing assignments and midterm and final papers instead of exams. This class is also taken by graduate students interested in genetics or considering a switch to plant biology for their postdoctoral training. I manage the Plant Biology Seminar (fall, winter, spring), and give occasional guest lectures in earth systems and human biology courses on world food issues and GMOs.

For many years I gave a freshman seminar on biotechnology, teaching students how to read and analyze scientific papers and how to debate the societal issues raised by new technologies. In 2017 I implemented a new freshman seminar *Visions of Paradise* concerning garden design that involved weekly visits to gardens with a short written report and garden guide to each, plus midterm and final projects in designing an ideal, personal garden.

Current Grant Support

NSF Plant Genomics Research Program 2014 – 2018 IOS-16-49424 Regulatory Hierarchies and Roles of Non-Coding RNAs in Maize Anthers. PI Blake Meyers

Patents Issued

United States Patent No. 9,516,824 on December 13, 2016 *Method for Modulating the Number of Archesporial Cells in a Developing Anther*

Publications on scientific writing and reviewing

Walbot, V. 2013. Domesticating the beast. **BMC Biology** 11: 35 doi: [10.1186/1741-7007-11-35](https://doi.org/10.1186/1741-7007-11-35) This is a short commentary following up on issues raised in "Are we training pit bulls to review our manuscripts?"

Walbot, V. 2009. Are we training pit bulls to review our manuscripts? **Journal of Biology** 8: 24-26. doi:[10.1186/jbiol125](https://doi.org/10.1186/jbiol125) Commentary.
3rd most accessed article of 2009 <http://jbiol.com/content/8/12/102>
Most viewed article in 2011

A decade of publications on anthers and use of *Ustilago maydis* to analyze maize development

Matei, A., C. Ernst, M. Günl, B. Thiele, J. Altmüller, V. Walbot, B. Usadel, and G. Doehlemann. 2017. How to make a tumor: Cell type specific dissection of *Ustilago maydis*-induced tumor development in maize leaves. Accepted, The New Phytologist.

van der Linde, K., L. Timofejeva, R. L. Egger, B. Ilau, G. Doehlemann, and V. Walbot. 2017. Pathogen designed to deliver host proteins: A biomolecular interpretation of the Trojan horse myth. Accepted, The Plant Cell.

Nan, G.-L., J. Zhai, S. Arikait, D. Morrow, J. Fernandes, L. Mai, N. Nguyen, B. C. Meyers and V. Walbot. 2017. MS23, a master basic helix-loop helix factor, regulates the specification and development of tapetum in maize. **Development** 144: 163-172. doi: [10.1242/dev.140673](https://doi.org/10.1242/dev.140673)

Egger, R. L. and V. Walbot. 2016. A framework for evaluating developmental defects at the cellular level: an example from ten maize anther mutants using morphological and molecular data. **Dev. Biol.** 419: 26-40. doi:[10.1016/j.ydbio.2016.03.016](https://doi.org/10.1016/j.ydbio.2016.03.016)

Walbot, V. and R. L. Egger. 2016. Pre-meiotic anther development: Cell fate specification and differentiation. **Annu. Rev. Plant Biol.** 67: 365–395. doi:[10.1146/annurev-arplant-043015-111804](https://doi.org/10.1146/annurev-arplant-043015-111804)

Egger, R. L. and V. Walbot. 2015. Quantifying *Zea mays* tassel development and correlation with anther developmental stages as a guide for experimental studies. **Maydica** 60: M34.

Murphy, K. M., R. L. Egger, and V. Walbot. 2015. Chloroplasts in anther endothecium of *Zea mays* (Poaceae). **Am. J. Bot.** 102:1931-1937 doi:[10.3732/ajb.1500384](https://doi.org/10.3732/ajb.1500384)

Zhang, H., R. Xia, B. C. Meyers, and V. Walbot. 2015. Evolution, functions and mysteries of plant ARGONAUTE proteins. **Current Opin. Plant Biol.** 27: 84-90. doi: [10.1016/j.pbi.2015.06.011](https://doi.org/10.1016/j.pbi.2015.06.011)

Redkar, A. L. Schilling, R. Hoser, B. Zechmann, M. Krzymowska, V. Walbot, and G. Doehlemann. 2015. A secreted effector protein of *Ustilago maydis* is required to guide host cells to form tumors in maize leaves. **Plant Cell** 27: 1332-1351. doi: <http://dx.doi.org/10.1105/tpc.114.131086>

274. co-first authors [Zhai, J.](#), [H. Zhang](#), S. Arikait, K. Huang, G. Nan, V. Walbot, and B. Meyers. 2015. Spatiotemporal and cell-type dependent biogenesis of phasi-RNAs during male reproduction in *Zea mays*. **Proc. Natl. Acad. Sci. USA** 112: 3146-3151. doi: [10.1073/pnas.1418918112](https://doi.org/10.1073/pnas.1418918112)

Commentary M. J. Axtell. 2015. The small mysteries of males. **Nature Plants** 1: 1-2. doi: [10.1038/NPLANTS.2015.55](https://doi.org/10.1038/NPLANTS.2015.55)

Kelliher, T., R. Egger, H. Zhang, and V. Walbot. 2014. Unresolved issues in pre-meiotic anther development. **Front. Plant Sci.** 5: Article 347. doi: [10.3389/fpls.2014.00347](https://doi.org/10.3389/fpls.2014.00347)

co-first authors [Zhang, H.](#), [R. Egger](#), [T. Kelliher](#), D. J. Morrow, J. Fernandes, G-L. Nan, and V. Walbot. 2014. Transcriptomes and proteomes define gene expression progression in pre-meiotic maize anthers. **G3** 4: 994-1010. Special issue on the Genetics of Sex. doi: [10.1534/g3.113.009738](https://doi.org/10.1534/g3.113.009738)

Schilling, L., A. Matei, A. Redkar, V. Walbot and G. Doehlemann. 2014. Virulence of the maize smut *Ustilago maydis* is shaped by organ-specific effectors. **Molecular Plant Pathology** 15: 780-789. doi: [10.1111/mpp.12133](https://doi.org/10.1111/mpp.12133)

Kelliher, T. and V. Walbot. 2014. Germinal cell initials accommodate hypoxia and precociously express meiotic genes. **Plant J.** 77: 639-652. doi: [10.1111/tpj.12414](https://doi.org/10.1111/tpj.12414)

Moon, J., D. Skibbe, L. Timofejeva, C.-J. R. Wang, T. Kelliher, K. Kremling, V. Walbot, and W. Z. Cande. 2013. Regulation of cell divisions and differentiation by MS32 is required for pre-meiotic anther development in *Zea mays*. **Plant J.** 76: 592-602. doi: [10.1111/tpj.12318](https://doi.org/10.1111/tpj.12318)

Li, G., T. Kelliher, L. Nguyen, and V. Walbot. 2013. *Ustilago maydis* reprograms cell proliferation in maize anthers. **Plant J.** 75: 903-914. doi: [10.1111/tpj.12270](https://doi.org/10.1111/tpj.12270)

Walbot, V. 2013. Open questions: Reflections on plant development and genetics. **BMC Biology** 11: 25. doi: [10.1186/1741-7007-11-25](https://doi.org/10.1186/1741-7007-11-25)

Wang, D., D. S. Skibbe, and V. Walbot. 2013. *Maize male sterile 8 (ms8)*, a putative beta-1,3-galactosyltransferase, is important for sugar metabolic functions during anther development. **Plant Reproduction** doi: [10.1007/s00497-013-0230-y](https://doi.org/10.1007/s00497-013-0230-y)

Timofejeva, L., D. S. Skibbe, S. Lee, I. Golubovskaya, R. Wang, L. Harper, V. Walbot, and W. Z. Cande. 2013. Cytological characterization and allelism testing of pre-meiotic anther developmental mutants identified in a screen of maize male sterile lines. **G3-GENES GENOMES GENETICS** 3: 231-249 doi: [10.1534/g3.112.004465](https://doi.org/10.1534/g3.112.004465)

Wang, D., C. M. Adams, J. F. Fernandes, R. L. Egger, and V. Walbot. 2012. A low molecular weight proteome comparison of fertile and *male sterile 8* anthers of *Zea mays*. **Plant Biotechnology J.** 10: 925-935. doi: [10.1111/j.1467-7652.2012.00721.x](https://doi.org/10.1111/j.1467-7652.2012.00721.x)

Kelliher, T. and V. Walbot. 2012. Hypoxia triggers meiotic fate acquisition in maize. **Science** 337: 345-348. doi: [10.1126/science.1220080](https://doi.org/10.1126/science.1220080) Our article was featured in PERSPECTIVES **Defining the Plant Germ Line—Nature or Nurture?** C. Whipple *Science* 337 (6092), 301. DOI: [10.1126/science.1224362](https://doi.org/10.1126/science.1224362)
Science Signaling EDITORS' CHOICE **Redox Status Incites Gametogenesis** P. J. Hines *Sci. Signal.* 5 (234), ec197. DOI: [10.1126/scisignal.2003413](https://doi.org/10.1126/scisignal.2003413)
Nature Reviews Genetics RESEARCH HIGHLIGHT **Development: Triggering meiotic fate.** M. Muers. doi:[10.1038/nrg3311](https://doi.org/10.1038/nrg3311)
<http://www.nature.com/nrg/journal/vaop/ncurrent/full/nrg3311.html>

Wang, C-J. R., G-L. Nan, T. Kelliher, L. Timofejeva, V. Vernoud, I. N. Golubovskaya, L. Harper, R. L. Egger, V. Walbot, and W. Z. Cande. 2012. Maize *multiple archesporial cell 1 (mac1)*, an ortholog of rice *TDL1A*, modulates cell proliferation and identity in early anther development. **Development** 139: 2594-2603. doi: [10.1242/dev.077891](https://doi.org/10.1242/dev.077891)

Nan, G-L., J. Fernandes, R. C. Wang, A. Ronceret, W. Z. Cande, and V. Walbot. 2011. Global transcriptome analysis of two *ameiotic1* alleles in maize anthers: defining steps in meiotic entry and progression through prophase I. **BMC Plant Biology** 11:120. doi: [10.1186/1471-2229-11-120](https://doi.org/10.1186/1471-2229-11-120)

Wang, DX., D. Skibbe, and V. Walbot. 2011. Maize *csmd1* exhibits pre-meiotic somatic and post-meiotic microspore and somatic defects but sustains anther growth. **Sexual Plant Reproduction** 24: 297-306. doi: [10.1007/s00497-011-0167-y](https://doi.org/10.1007/s00497-011-0167-y)

Pimentel, S., J. Fernandes, and V. Walbot. 2011. GRFT Genetic records family tree web applet. **Frontiers in Plant Genetics Genomics.** doi: [10.3389/fgene.2011.00014](https://doi.org/10.3389/fgene.2011.00014)

Kelliher, T. and V. Walbot. 2011. Emergence and patterning of the five cell types of the *Zea mays* anther locule. **Developmental Biology** 350: 32-49. doi:[10.1016/j.ydbio.2010.11.005](https://doi.org/10.1016/j.ydbio.2010.11.005)

Picked as an Editor's Choice for a feature in SCIENCE
<http://www.sciencemag.org/content/331/6018/651.3.full>

Wang, D.-X. J. A. Oses-Prieto, K. H. Li, J. F. Fernandes, A. L. Burlingame, and V. Walbot. 2010. The *male sterile 8* mutation of maize disrupts the temporal progression of the transcriptome and results in mis-regulation of metabolic functions. **Plant J.** 63: 939-951. doi: [10.1111/j.1365-313X.2010.04294.x](https://doi.org/10.1111/j.1365-313X.2010.04294.x)

Skibbe, D. S., G. Doehlemann, J. Fernandes and V. Walbot. 2010. Maize tumor formation after *Ustilago maydis* infection requires organ-specific gene expression by both partners. **Science** 328: 89 – 92. doi: [10.1126/science.1185775](https://doi.org/10.1126/science.1185775)

Walbot, V. and D. S. Skibbe. 2010. Maize host requirements for *Ustilago maydis* tumor induction. **Sexual Plant Reproduction** 23: 1-13. doi: [10.1007/s00497-009-0109-0](https://doi.org/10.1007/s00497-009-0109-0)

Johnson, C., A. Kasprzewska, K. Tennessen, J. Fernandes, G. Nan, V. Walbot, V. Sundaresan, V. Vance and L. H. Bowman. 2009. Clusters and superclusters of phased small RNAs in the developing inflorescence of rice. **Genome Research** 19: 1429-1440. [doi:10.1101/gr.089854.108](https://doi.org/10.1101/gr.089854.108)

Skibbe, D. S., J. F. Fernandes, K. Medzihradzsky, A. L. Burlingame, and V. Walbot. 2009. Mutator transposon activity reprograms the transcriptome and proteome of developing maize anthers. **Plant J.** 59: 622-633. [doi: 10.1111/j.1365-313X.2009.03901.x](https://doi.org/10.1111/j.1365-313X.2009.03901.x)

Ma, J., D. S. Skibbe, J. Fernandes, and V. Walbot. 2008. Male reproductive development: Gene expression profiling of maize anther and pollen ontogeny. **Genome Biology** 9:R181 [doi:10.1186/gb-2008-9-12-r181](https://doi.org/10.1186/gb-2008-9-12-r181).

Ma, J., D. Duncan, D. J. Morrow, J. Fernandes, and V. Walbot. 2007. Transcriptome profiling of maize anthers using genetic ablation to analyze pre-meiotic and tapetal cell types. **Plant Journal** 50: 637-648. [doi: 10.1111/j.1365-313X.2007.03074.x](https://doi.org/10.1111/j.1365-313X.2007.03074.x)

Ma, J., D. J. Morrow, J. Fernandes, V. Walbot. 2006. Comparative profiling of the sense and antisense transcriptome of maize lines. **Genome Biology** 7:R22 [doi: 10.1186/gb-2006-7-3-r22](https://doi.org/10.1186/gb-2006-7-3-r22)