Jonathan Nesbit Fitz Gerald
Rhodes College
Department of Biology
2000 North Parkway
Memphis TN 38112
Phone 901 843-3560
Fax 901 843-3565
E-mail fitzgeraldj@rhodes.edu

Education:

2002 **University of Chicago** Ph. D. Molecular Genetics and Cell Biology
1991 **University of California at Irvine** B. S. Biology

Present Position:

Associate Professor of Biology, Rhodes College, Memphis TN

Prior Research Experience:

2003-2007 Post-Doctoral Fellow, Temasek Lifesciences Laboratory *began at the Ecole Normale Superieure, Lyon France (2003-2004)*
Department of Chromatin and Reproduction
Supervisor: Dr. Frédéric Berger

Project: Analysis of altered seed development in mutants of the Arabidopsis formin, AtFH5. *Genetic analysis of interactions between* AtFH5 *and Polycomb group complexes. Isolation and analysis of the novel endosperm development regulator*, titus andronicus.

2002-2003 Post-Doctoral Fellow, University of Chicago
Department of Molecular Genetics and Cell Biology
Supervisor: Dr. Jocelyn Malamy

Project: Quantitative genetic analysis of lateral root inhibition in response to low water stress. QTL mapping of major effect loci responsible for phenotypic differences in Columbia and Landsberg Arabidopsis thaliana *ecotypes.*

2002 Post-Doctoral Fellow, University of Chicago
Department of Molecular Genetics and Cell Biology
Supervisor: Dr. Stephen Kron

Project: Homology modeling of yeast and mammalian cyclin-dependent kinases and structure based design of CDC28 *(yeast CDK) alleles that are restricted in cyclin binding*.

1997-2002 Graduate Research Assistant, University of Chicago
Department of Molecular Genetics and Cell Biology
Supervisor: Dr. Stephen Kron

Doctoral Thesis: The G1 DNA damage checkpoint in *Saccharomyces cerevisiae*.
Project: Genetic characterization of G1 DNA damage checkpoint regulation in Saccharomyces cerevisiae*. Designed and implemented G1 phase specific DNA damage checkpoint assays.*

1995-1996 Graduate Research Assistant, University of Chicago
Department of Molecular Genetics and Cell Biology
Supervisor: Dr. Brian Keith
Project: Genetic and morphological characterization of Arabidopsis thaliana cvp *mutants that display embryonic defects in vascular patterning.*

1995 Summer Intern, Abbott Laboratories, North Chicago IL
Supervisor: Dr. Charles Hutchins
Project: Structural modeling and analysis of A. thaliana *enzymes based on X-ray crystal structures from homologous proteins. Developed a database of potential small molecule inhibitors of chorismate mutase based on modeled active site.*

1994 Laboratory Technician, University of Chicago
Department of Ecology and Evolution
Supervisor: Dr. Deborah Charlesworth
Project: Study of evolutionary mechanisms for development of sexual dimorphism using cytogenetic and molecular genetic analysis of Silene alba*.*

1990-1991 Undergraduate Research Assistant, University of California at Irvine
Laboratory of Phytochemistry and Toxicology
Supervisor: Dr. Eloy Rodriguez
Project: Characterization of a ring expansion reaction in a secondary metabolite from the Guyule Rubber Plant. Isolation and identification of toxic compounds from the Brazilian Pepper Tree.

Teaching Experience:

2007-Present Associate Professor, Rhodes College
Courses: Biology I, Biology I lab, Biology II lab, Mechanisms of Development, Animal Development, Genetics, Plant Genetics and Diversity, Population Genomics, Molecular Biology Lab, Senior Seminar: Stem Cells and Regeneration, Senior Seminar: Seeds, Senior Seminar: Metamorphosis, Senior Seminar: Evolution of Multicellularity, Senior Seminar: GMOs, Gene Editing and Synthetic Biology, Introduction to Computer Science, First-year Writing Seminar: Science Writing, MCAT preparation, First-year Experience Seminar, Kenya Maymester: Frontiers in Future Farming

2003-2005 Guest Lecturer, Cold Spring Harbor Summer Courses
"Molecular Approaches in Plant Science"
As an assistant to Dr. Jocelyn Malay, ran a lab section in QTL mapping. Independently conducted a workshop in biostatistics and QTL analysis.

2001-2002 Guest Lecturer, Pritzker Medical School, University of Chicago
"Rational Drug Design"

2000-2001 Teaching Assistant, University of Chicago
"Molecular Biology II"

Assisted Dr. Steve Kron in an innovative course for freshman biology majors incorporating weekly journal articles, interviews with the authors and oral presentations. Lab sections were coordinated with the authors and included experiments from the weekly paper.

1997 Teaching Assistant, University of Chicago
"Development"

Assisted in a summer course for high school biology teachers. I gave three lectures on plant development.

1996 Teaching Assistant, University of Chicago
"Introduction to Genetics"

A course for non-majors where I assisted Dr. Ed Garber, ran lab sessions and taught a mini-course in genetic analysis.

1992-1993 Assistant Head of Science Department
Matshekge Hill Senior Secondary, Bobonong Botswana

Taught Cambridge O-level Biology and Combined Sciences in a school of 750 students. Assisted Dr. James Banda with running of department, organizing curriculum and preparation of exams.

Awards and Fellowships:

2023-Present James T. and Valeria B. Robertson Chair in Biological Sciences.
2019 "Integrating Meaningful Practices with Access to Computational Thinking: Towards Increasing the Academic and Career Success of STEM Students" Betsy Sanders, Jonathan Fitz Gerald, Mauricio Cafiero, Katherine White NSF Division Of Undergraduate Education (DUE-1930377) $650,000
2019 "Urban Teacher Partnership for Culturally Relevant STEM Education" Zachary A. Casey, Dana A. Horgen, Christopher W. Seaton, Jonathan N. Fitz Gerald NSF Robert Noyce Teacher Scholarship Program, Division of Undergraduate Education (DUE1852661) $1,168,344
2013 "RUI-Identification of Genes and Cellular Processes Targeted by Imprinted Pathways in Natural Variants of Arabidopsis thaliana**"** Jonathan Fitz Gerald (PI) NSF Molecular and Cellular Biosciences Program, Genetic Mechanisms Division (MCB-1244101) $412,000
2010 CAP Mellon Study Leave Program
2008, 2009, 2011, 2012, 2019,2020 Faculty Development Endowment, Rhodes College
2008, 2010, 2013 Hill Fund Recipient, Rhodes College
2003 "Genetic Analysis of Arabidopsis Seed Endosperm Development" Jonathan Fitz Gerald (PI) NSF International Research Fellowship (IRFP-0301886) $98,173.00

University of Chicago Dean's Merit Scholar Molecular and Cellular Biology NIH Training Grant

Peer-Reviewed Publications:

J.N. Fitz Gerald, S, Altamirano, B. Smith and N. Winston, "QTL mapping of parental contributions to seed size show paternal regulation of maternal gene expression in Arabidopsis." in preparation**.**

N.X. Hou, J. Haymore and J.N. Fitz Gerald "QTL mapping of a non-conflict derived parental regulation of seed size in Arabidopsis" in preparation.

A.G. Gardner, J.N. Fitz Gerald, J. Menz†, K.A. Shepard, D.G. Howarth and R.S. Jabaily, "Characterizing floral symmetry in the core Goodeniaceae with geometric morphometrics." **PLoS One**. 11(5): e0154736 doi:10.1371/journal.pone.0154736 (2016)

J.N. Fitz Gerald, A.L. Carlson, E. Smith, J. Maloof, D. Weigel, J. Chory, J.O. Borevitz and R.J. Swanson, "New Arabidopsis advanced intercross recombinant inbred lines (Van-0 X Col-0) reveal female control of nonrandom mating." **Plant Physiol**. 165(1): 175-185 (2014)

A.W. Truman, A.A. Kitazono, J.N. Fitz Gerald and S.J. Kron, "Cell Cycle: Regulation by Cyclins." In: **Encyclopedia of Life Sciences**, John Wiley & Sons, Ltd: Chichester (2012)

A.L. Carlson, J.N. Fitz Gerald, M. Telligman†, M. Roshanmanesh and R.J. Swanson, "Defining the genetic architecture underlying female- and male-mediated nonrandom mating and seed yield traits in Arabidopsis." **Plant Physiol.** 157(4):1956-64. (2011)

J.N. Fitz Gerald, S.H. Poh† and F. Berger, "Polycomb group dependent imprinting of the actin regulator *AtFH5* in *Arabidopsis thaliana* regulates morphogenesis." **Development**, 136 (20):3399-3404 (2009)

J.N. Fitz Gerald, M. Luo, A. Chaudhury and F. Berger, "DNA methylation causes predominant maternal controls of plant embryo growth." **PLoS ONE** 3(5):e2298. doi:10.1371/journal.pone.0002298 (2008)

F. Berger, J.N. Fitz Gerald and M. Ingouff, "*Arabidopsis* as a model for understanding basics of endosperm development." Book chapter in **Endosperm: Developmental and Molecular biology**, edited by 0. A. Olsen. Springer-Verlag Berlin Heildelberg 91110(2007)

J.N. Fitz Gerald, M.D. Lehti-Shiu, P.A Ingram, K.I. Deak, T. Biesiada and J.E. Malamy, "Identification of quantitative trait loci that regulate Arabidopsis root system size and plasticity." **Genetics** 172(1): 485-498 (2006)

M. Ingouff, J.N. Fitz Gerald*, C. Guerin, H. Robert, M.B. Sorensen, D. Van Damme, D. Geelen, L. Blanchoin and F. Berger, "Plant formin *AtFH5* is an evolutionary conserved actin nucleator involved in cytokinesis." **Nature Cell Biology** 7(4): 374-380 (2005) (*cofirst author)

D. Garcia, J.N. Fitz Gerald and F. Berger, “Maternal control of integument cell elongation and zygotic control of endosperm growth are coordinated to determine seed size in Arabidopsis.” **Plant Cell** 17(1): 52-60 (2005)

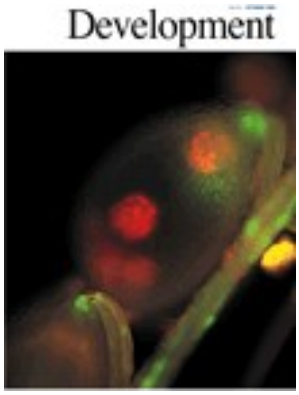
J.N. Fitz Gerald, J.A. Benjamin† and S.J. Kron, "Robust G1 checkpoint arrest in budding yeast: Dependence on DNA damage signaling and repair," **Journal of Cell Science**, 115: 1749-1757 (2002)

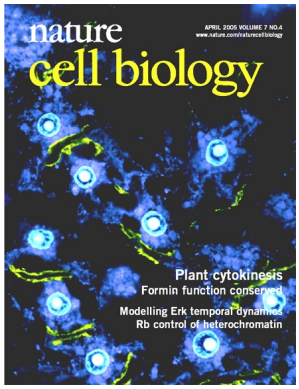
S.H. Ahn, B.R. Tobe, J.N. Fitz Gerald, S.R. Anderson†, A. Acurio and S.J. Kron, "Enhanced cell polarity in mutants of the budding yeast cyclin-dependent kinase Cdc28p," **Molecular Biology of the Cell**, 12: 3589-3600 (2001)

F.M. Carland, B.L. Berg, J.N. FitzGerald, S. Jinamornphongs†, T. Nelson and B. Keith "Genetic regulation of vascular tissue patterning in Arabidopsis.” **Plant Cell** 11(11): 2123-37 (1999)

(† denotes undergraduate authors)

Journal Covers:





Presentations, Workshops and Invited Talks:

“The Council on Undergraduate Research (CUR) Biology Division: A Dynamic Community Promoting Best Practices in Undergraduate Biology Education” Safford S, Wolyniak MJ, Fitz Gerald JN, Durham Brooks T, Barton L, Giordano S; Division Chair: Beth Beason-Abmayr, Poster at ConnectUR, College Park MA (2026)

“Finding and getting a job at a Primarily Undergraduate Institute (PUI)” Jonathan Fitz Gerald, Csengele Barta and William Serson. Virtual Workshop for ASPB Outreach. (2024)

“PUI Faculty Development Workshop”, Organizer/Facilitator, American Society for Plant Biology 2024 Conference, Honolulu, HI (2024)

“PUI Faculty Development Workshop”, Organizer/Facilitator, American Society for Plant Biology 2023 Conference, Savannah, GA (2023)

"'There's so much you can do with a bag of beans': Lab based Professional Development with Practicing Urban STEM P-12 Teachers" Fitz Gerald JN, Casey, ZA, Poster at Noyce Summit (2023)

"How effective is the CURE? Assessing efficacy and potential side effects from active based learning strategies" Virtual Workshop, Elisabeth City State University (2023)

"Developing and assessing a mini-CURE framework." Virtual Workshop, College of Wooster (2022)

"R Studio to build NGSS projects: R Studio Foundations", Virtual Workshop for Shelby County Schools K-12 STEM teachers. (2022)

"Identifying and removing blocks to 3D science learning in local K-12 classes" Fitz Gerald JN, Horgen D, Seaton C, Casey, ZA, Poster at Noyce Summit (2022)

"Authentic research opportunities for all through CUREs: The Council on Undergraduate Research Mentorship for Integrating Research into the Classroom program" Workshop for American Society for Biochemistry and Molecular Biology CURE Lunch and Learn Series. *Virtual* (2022)

"MIRIC (Mentoring the Integration of Research Into the Classroom) Network affinity groups explore diverse ways to prepare instructors to teach CUREs" Wolyniak MJ, Barton LF, Fitz Gerald JN, Putzke AP, and Resendes KK, Poster presentation at ConnectUR Washington DC, (2022)

"PUI Faculty Development Workshop", Instructor, American Society for Plant Biology Worldwide Summit *Virtual* (2021)

"Genetic Architecture of imprinting regulation in natural variants of Arabidopsis." Session Chair and Oral Presentation at the International Conference on Plant Science in Valencia, Spain (2019)

"Genetic and cellular architecture of parentally biased seed size determinants." Oral Presentation at the Population, Evolution and Quantitative Genetics Meeting of the Allied Genetics Conference, Orlando FL (2016)

"Natural variation in Arabidopsis *AtFH5* expression indicates an adaptive role for Polycomb regulation of the seed endosperm." Small talk at the International Conference on Arabidopsis Research, Vancouver, BC, Canada (2014)

"Applying inquiry-based strategies to reinforce integration of disciplines in an evo-devo course" Oral Presentation at the Society of Developmental Biologist Regional Meeting, Nashville TN (2013)

"Examining parental conflict as a mechanism for the epigenetic regulation of seed development in Arabidopsis." Invited speaker, University of Miami (2012)

"Characterization of parentally-biased events during the development of the Arabidopsis seed endosperm using native autofluorescence" Oral Presentation at the International Conference on Arabidopsis Research, Vienna, Austria (2012)

"Characterization of parentally-biased events during the development of the *Arabidopsis thaliana* seed endosperm using native autofluorescence." Oral presentation and the

Society of Developmental Biology regional meeting, St. Jude's Research Hospital, Memphis (2012)

"The Polycomb target *AtFH5*, an Arabidopsis formin homolog, as a potential realizator of seed size variation through parental genomic imprinting." Invited speaker, University of Chicago (2011)

"Polycomb-dependent parental imprinting of the Arabidopsis formin homolog, *AtFH5*." Invited speaker, University of Memphis (2010)

"Polycomb regulates endosperm structure through parental and regional silencing of the Arabidopsis formin *AtFH5*: developmental and evolutionary perspectives." Invited speaker at ENS RDP, Lyon France (2009)

"Direct regulation of an actin nucleating formin by Polycomb: a link between pattern and morphogenesis". Oral presentation at the EMBO Conference on Chromatin and Epigenetics, EMBL Heidelberg, Germany (2007)

"Root system diversity links drought sensing with developmental plasticity". Oral presentation at 14th International Conference on Arabidopsis Research, Madison WI, (2003)

"Essential roles for *S. cerevisiae* cyclin-dependent kinase in DNA damage checkpoint arrest". Oral presentation at ASM DNA damage and repair, Hilton Head SC, (1999)

Selected Abstracts from Undergraduate Researchers (presenter underlined**):**

"Combined classical genetics and genomics approaches identify novel candidate genes for regulating parental bias in Arabidopsis seed size." Jonathan Fitz Gerald and Lauren Hamm. Poster presentation at the ASPB Plant Biology Conference in Honolulu, HI (2024)

"Dissecting the regulation of imprinted gene targets using natural ascensions of *Arabidopsis thaliana*." Lauren Hamm, Matthew Smith and Jonathan Fitz Gerald. Poster presentation at the International Conference on Plant Science in Valencia, Spain (2019)

"The *Arabidopsis* chromatin remodeling proteins demonstrates a novel parental effect on seed size and genomic imprinting." Meghan Hansen, Madeleine Mabante and Jonathan Fitz Gerald. Poster presentation at the International Conference on Plant Science in Valencia, Spain (2019)

"Using natural variation in Arabidopsis thaliana to describe the role of Parental Conflict in seed size and robustness." Nuanqiu Hou, Ashley Bruneau and Jonathan Fitz Gerald. Poster presentation at the International Conference on Plant Science in Valencia, Spain (2019)

"Using natural variation to uncover potentially adaptive transcriptional networks in *Arabidopsis thaliana* seed size regulation." Dexter Griffin and J.N. Fitz Gerald. Poster presented at GARNet's Natural Variation Conference. Cambridge, UK (2016)

"Dissecting the regulation of imprinted gene targets using natural ascensions of *Arabidopsis thaliana*." Matthew Smith and J.N. Fitz Gerald. Poster presented at GARNet's Natural Variation Conference. Cambridge, UK (2016)

"Genetic architecture of parentally-biased seed size determinants." Jamara Haymore and J.N. Fitz Gerald. Poster presented at 25th Annual International Conference of Arabidopsis Research, Vancouver BC (2014)

"A putative maternal polarity complex for posterior (chalazal) endosperm development in Arabidopsis." Phuong Le, B. Durbin and J.N. Fitz Gerald. Poster presented at 25th Annual International Conference of Arabidopsis Research, Vancouver BC (2014)
"Natural variation in Arabidopsis *AtFH5* expression indicates an adaptive role for Polycomb regulation in the seed endosperm." Ellen Dahl, D. Altamirano and J.N.Fitz Gerald. Oral presentation at the regional Society of Developmental Biologists meeting, Nashville TN (2013). Best Speaker Award.
"Imprinted expression of polarizing genes in the seed endosperm is subject to natural variation." Brittany Pope, J. Chan, R. Ishii and J.N. Fitz Gerald. Poster presented at the 22nd Annual International Conference of Arabidopsis Research Madison, Wisconsin (2011)
"Paternal regulation of maternal gene expression may provide an adaptive mechanism in *Arabidopsis thaliana*." Maria E. Cartagena and J. N. Fitz Gerald. Poster presented at the 20th Annual International Conference of Arabidopsis Research Edinburgh, Scotland (2009)

Synergistic Activities:

Faculty Committees and Task Forces

General Education Task Force (2025-Present)
Admissions and Enrollment Committee (2023-2026, Chair 2024)
Curriculum Review Task Force (2024-2025)
Committee on Committees, Chair (2019-2020)
Departmental Education Program Assessment Committee, Chair (2016-17)
Institutional Research Board
Academic Advising Committee
FEATS First year Faculty Mentoring committee (2016-2020)
Teaching mentor (2014-2016)
Chaired or participated in multiple job search committees

Additional College Service

Global Rhodes Advisory Board (2025-Present)
ACS SEED Summer Research Supervisor (2024,2025)
Participant in Grant Proposal Writing:

2018,2019	NSF S-STEM proposal
2018	NSF Noyce proposal
2017	HHMI proposal

Student Success and Retention Committee

Department Services

2026	Supervisor, SPROUT Summer Research Fellowship
2008, 2011,2018,2021, 2023,2024	Director of First term core lab
2012	Co-director of first term core lab
2008-Present	Director of Biology Imaging Center

2011-2019 Supervisor, Advanced Inquiries in Development Fellowship program

Research mentor to 2 students during academic year who showed mastery of developmental biology in Mechanisms of Development and who wished to pursue research in the field.

2009-Present RSAP Supervisor, Digital Imaging Analysis Technician *Research mentor to student responsible for maintaining Imaging Center and online tutorials. RSAP also acts as TA for courses requiring microscopy. Each RSAP develops their own research.*

2015-2019 RSAP Supervisor, Computational Biology

Research mentor to student who produces online computational resources to aid in teaching of biology.

2023-Present RSAP Supervisor, Greenhouse Technician

Mentoring a student associate who maintains the greenhouse.

Additional general activities such as student advising, work on SLOs and chairing an SLO committee, teaching and scholarship mentor to Biology junior faculty

National and Regional Services

2024-Present Director of Mentoring the Integration of Research Into the Classroom (MIRIC) Program

2022-Present MIRIC Facilitator

2022-2024 Elected American Society of Plant Biology PUI Steering Committee, 2023 Chair

2021-Present Elected National Council of Undergraduate Research Representative: Biology

2016-Present Shelby County Schools (SCS), In Service training for middle and high school biology teachers

2016, 2021,2024 Review Panel, NSF MCB Genetic Mechanisms

2013-present SCS, Various elementary school plant science projects at Snowden and Idlewild Elementary schools

Various Grant and Publication reviews

Program Development

2025 Future of Farming: Kenya Maymester.

Developed a collaboration with the ICRISAT Nairobi facility to provide students with hands-on research experience at the ICRAF campus. Students lived and worked in Nairobi for three weeks, engaging in applied research while exploring Kenya's rich cultural and ecological diversity. The program also included daily Swahili language instruction.