

Jeffrey P. MacKeigan, Ph.D.

Professor of Cancer Biology
& Complex Diseases
College of Human Medicine
Michigan State University
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Grand Rapids, MI 49503

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Website mackeiganlab.org
 www.facebook.com/MacKeigan.Laboratory

EDUCATION

1995 University of Colorado, Boulder
 B.A. in Molecular, Cellular and Developmental Biology (Minor, Biochemistry)
2002 University of North Carolina, Chapel Hill
 Ph.D. in Microbiology and Immunology (and Cancer Biology)

CITIZENSHIPS

United States and Canada

RESEARCH EXPERIENCE/TRAINING

1994–1995 Undergraduate Independent Research, University of Colorado, Boulder
1995–1998 Gene Therapy Research Associate, Valentis Incorporated, San Francisco, California
1998–2002 Cancer Cell Biology Training Program, Lineberger Comprehensive Cancer Center,
 University of North Carolina, Chapel Hill (advisor, J.P. Ting)
2002–2004 Postdoctoral Fellowship, Harvard Medical School, Boston, Massachusetts
 (advisor, J. Blenis)
2004–2006 Investigator and Project Team Leader - PI3K/mTOR Pathway, Developmental and
 Molecular Pathways Expertise Platform, Novartis Institutes Biomedical
 Research, Cambridge, Massachusetts
2006–2010 Assistant Professor, Laboratory of Systems Biology, Van Andel Research Institute,
 Grand Rapids, Michigan
2006–2018 Faculty, Van Andel Institute Graduate School, Grand Rapids, Michigan
2007–date Adjunct Professor, Department of Biochemistry and Molecular Biology
 Faculty, Quantitative Biology & Modeling Initiative, Center for Systems Bio.
 Adjunct Faculty Member, Genetics Program, MSU, East Lansing
2010–2017 Associate Professor, Laboratory of Systems Biology, VARI
 Center for Cancer and Cell Biology, Innovation and Integration Program, VARI
2017–date Adjunct Professor, Van Andel Research Institute, Center for Cancer and Cell Bio.
2017–date Professor of Cancer Biology & Complex Diseases, Global Impact Initiative, MSU
2017–date Professor of Cancer Biology & Complex Diseases, Obstetrics, Gynecology and
 Reproductive Biology; Pediatrics and Human Development; College of
 Human Medicine, Michigan State University

RESEARCH INTERESTS

"No great discovery was ever made without a bold guess."

- *Isaac Newton*

Our lab seeks a systems level understanding of cancer biology and cell signaling networks that encompass autophagy, the mTOR pathway and cancer metabolism. Our research involves a variety of cutting-edge technologies, and we use our tumor biology expertise and pathway knowledge to study complex diseases. All of our research projects have one common goal—to identify novel therapeutic targets.

PROJECTS

Autophagy (resistance to cell death)

Autophagy functions to generate energy, clear damaged organelles, and delay or prevent cell death during times of cellular stress. Chemotherapeutic agents trigger autophagy, allowing cancer cells to adapt and withstand treatment. Therefore, a better understanding of autophagy is critical for developing new and improved treatment strategies in cancer. Our lab has used predictive computational modeling and cell-based measurements to accurately model the autophagic process. We are now validating and extending our model to predict the therapeutic benefit of inhibiting autophagy in cancer. Additionally, our group conducts optimized kinase and phosphatase assays for in vitro evaluation of compounds identified in silico. Our research suggests that these kinase inhibitors modulate autophagy, and may be more selective and effective than current lysomotropic agents.

Tuberous Sclerosis Complex (molecular pathway expertise)

Tuberous sclerosis complex is a genetic disease resulting from mutations in the TSC1 and TSC2 genes. The disease causes non-cancerous tumors in vital organs throughout the body, such as the brain, skin, eyes and heart. These tumors can cause a host of health issues, including epilepsy and autism. Our lab has characterized the genomic landscape of TSC tumors using next-generation sequencing and new computational approaches. We have gained a more comprehensive understanding of TSC tumor biology, and we are investigating whether novel, clinically actionable aberrations exist.

Cancer Metabolism (dysregulated cellular energetics)

Researchers have gained more knowledge about altered metabolism as a driving force in cancer cells; however, more research and insights are needed. Our lab aims to uncover the molecular details responsible for altered cancer cell metabolism. To date, we have characterized two important mitochondrial phosphatases and explored their roles in apoptosis and chemosensitivity. Our findings have led us to experiments surrounding cardiolipin, a phospholipid that serves many important functions in maintaining mitochondrial health.

AWARDS AND HONORS

- 1994–1995 Undergraduate Research Opportunity Project Award
- 1998 Burroughs Wellcome Graduate Scholar Award
- 1999–2002 Graduate & Professional Student Federation Senator
- 2001–2002 NIH Institutional Predoctoral NRSA Fellowship
- 2003 Harvard Medical School Cell Biology Postdoctoral Fellowship
- 2004 American Cancer Society Postdoctoral Fellowship
- 2004–2008 Elected to American Association of Cancer Research Associate Council
- 2007–2008 Chairperson, American Association of Cancer Research Associate Council
- 2017 Global Impact Initiative, Michigan State University

LEADERSHIP AND MEMBERSHIPS AND SERVICE

Athletics

- 1992–1995 University of Colorado Men's Ice Hockey Team, Boulder CO

Society

- 1998–date American Association for Cancer Research
- 2009–date American Association for the Advancement of Science
- 2010–date The American Society for Microbiology

Committees

- 2001 Admissions Committee, Microbiology and Immunology, Univ. of North Carolina
- 2001 Graduate Program Review Committee, University of North Carolina
- 2006 Student Handbook Committee, Van Andel Institute Graduate School
- 2007 American Association of Cancer Research: Think Tank
- 2007–2008 American Association of Cancer Research: Future Leaders Symposium
- 2007–2009 American Association of Cancer Research: Presidential Circle
- 2007 Chair, Flow Cytometry Core Lab User Committee, Van Andel Research Institute
- 2008–2009 Hannah Chair Search Committee, Michigan State University
- 2008 Van Andel Research Institute representative, ClinXus
- 2008 The Critical Path Institute: Kinase Inhibitor Toxicity Workgroup
- 2008–2009 Co-Organizer, Origins of Human Cancer Symposium, Van Andel Research Institute
- 2008–2009 Co-Editor, *Oncogene Reviews*, Origins of Cancer
- 2007–2010 Graduate Program Committee, Van Andel Institute Graduate School
- 2008–2013 American Association for Cancer Research: Centennial Grant reviewer
- 2009 Search Committee, Assistant Dean, Van Andel Institute Graduate School 2009
- 2011 VARI/TGen Scientific Retreat Planning Committee
- 2009–2012 Board of Directors, Camp Henry (Board President, 2011)
- 2009–2012 Board of Directors, Parkinson's Disease Associates of West Michigan
- 2010–2011 Van Andel Research Institute-TGen Institutional Biosafety Committee
- 2010–2011 Member, Curriculum Committee, Van Andel Institute Graduate School
- 2011–2013 Chair, Curriculum Committee, Van Andel Institute Graduate School
- 2012–2013 Chair, Search Committee for Cancer and Cell Biology faculty, VARI
- 2011 Search Committee, Jay Van Andel Parkinson Research Lab, VARI
- 2012–2014 Council for Research Affairs, Van Andel Research Institute
- 2012–2014 Chair, Institutional Biosafety Committee, Van Andel Research Institute

- 2012–2013 Higher Learning Commission, Criterion 4 – Teaching & Learning (Chair), Van Andel Institute Graduate School
- 2013–2016 Chair, Admissions Committee, Van Andel Institute Graduate School
- 2013–2016 Member, Spectrum Health Tumor Sequencing Advisory Board
- 2016–2017 Faculty Advisory Committee for Confocal Microscopy, Flow Cytometry, and Quantitative Imaging
- 2016–2017 Search Committee for Nutrition and Metabolism faculty, VARI
- 2016–2017 Graduate Program Committee, Van Andel Institute Graduate School
- 2016–2017 Higher Learning Commission, Criterion – Mission (Chair), Van Andel Institute
- 2017 Event Chair, New Frontiers in Cancer Metabolism
- 2017–date TSC Preclinical Consortium Member
- 2015–date TSC Alliance Biosample Repository Use Committee
- 2017–date TSC Preclinical Pathology Outcomes Working Group
- 2017–date TSC Preclinical Functional Outcomes Working Group
- 2017–date MSU Pediatrics Developmental Neuroscience search committee

Research Guidance Committees

- 2007–2011 Katie Martin, Michigan State University (advisor, Jeff MacKeigan)
- 2008–2012 Natalie Niemi, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2008–2012 Jian Chen, Michigan State University (advisor, Kathy Gallo)
- 2008–2015 Hye Jin Hwang, Michigan State University (advisor, John LaPres)
- 2009–2012 Jonathan Karnes, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2009–2013 Laura Westrate, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2009–2013 Megan Goodall, Michigan State University (advisor, Jeff MacKeigan)
- 2010–2015 Danielle Burgenske, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2011–2017 Eric Nollet, Van Andel Institute Graduate School (advisor, Cindy Miranti)
- 2011–2016 Rewatee Gokhale, Michigan State University (co-advisors, Arnosti and Shingleton)
- 2012–2013 Yinjiao Ma, Michigan State University (advisor, Brian Haab)
- 2013–2017 Nate Merrill, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2013–2017 Aditi Bagchi, MD, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2015–2017 Nanda Kumar Sasi, Michigan State University (advisor, Michael Weinreich)
- 2014–2018 Abigail Solitro, Van Andel Institute Graduate School (advisor, Jeff MacKeigan)
- 2017–date Lisette Yco, Michigan State University (advisor, Jeff MacKeigan)

Editorial Boards

- 2011–2016 American Journal of Cancer Research
- 2011–2016 Chinese Journal of Cancer
- 2013–2016 BioMed Research International
- 2014–2016 Cancer Research Frontiers
- 2015–2016 Autophagy (Associate Editor)

Service

Ad hoc reviewer for: *Autophagy*, *British Journal of Cancer*, *Cell Reports*, *Current Biology*, *Experimental Cell Research*, *Genes and Development*, *Leukemia Research*, *Molecular Cancer Therapeutics*, *Molecular and Cellular Biology*, *Nature Biotechnology*, *Nature Cell Biology*, *Nature Communications*, *Oncogene*, *PlosOne*, *Proceedings of the National Academy of Sciences*, *Science Signaling*, *Scientific Reports*.

Grant Reviews/Study Section

- 2006–2016 American Association for Cancer Research
2007 University of Michigan – Internal Grant Program
2010–2013 State of Florida Grant Reviews
2011 German Federal Ministry of Education and Research, National Consortia for Rare Disease Research
2013 National Institutes of Health, National Cancer Institute-Special Emphasis Panel (ZCA1 RPRB-B M2), NCI Program Project (P01) February 28, 2013. (Reviewed research program project applications requesting \$58,590,262 in support)
2013 Prostate Cancer UK Grant Applications (Reviewed applications submitted for Project Grants, Pilot Awards & Clinical Research Grants)
2013 National Institutes of Health, National Cancer Institute-Basic Mechanisms of Cancer Therapeutics. October 7-8, 2013. (Reviewed research project applications requesting \$145,793,944 in support)
2013–2018 Tuberos Sclerosis Alliance Research Grant Applications
2015 National Institutes of Health, National Cancer Institute-Special Emphasis Panel (ZRG1 F09A-D 20 L), NCI Fellowships: Oncology, March 26-27, 2015.
2015 Michael J. Fox Foundation Target Advancement: Fall program, October 6th, 2015.
2016 National Institutes of Health, National Cancer Institute-Review Meeting. (ZCA1 SLB-C J2) NCI Provocative Question #5: November 2nd, 2016.
2017 National Institutes of Health, National Cancer Institute-Special Emphasis Panel, Developmental Therapeutics (ZRG1 OTC-K 02) June 22nd, 2017. (ZCA1 SLB-C J2) NCI Provocative Question #5: November 2nd, 2016.
2018 National Institutes of Health, National Cancer Institute, (PAR-16-131) Emerging Questions in Cancer Systems Biology (U01) March 16th, 2018.

INVITED PRESENTATIONS

- 2005 Profession Advancement Series, AACR Annual Meeting, Anaheim, CA
2005 Novartis Respiratory Disease Seminar Series, Horsham, United Kingdom
2005 Novartis Oncology & Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland
2005 Cellzome Proteomics Seminar Series, Heidelberg, Germany
2005 European Union for RNA Interference Technology, Institute Pasteur, Paris, France
2006 Emerging Careers, AACR Annual Meeting, Washington D.C.
2006 Harnessing the Power of RNAi Users Forum, Boston, MA
2006 Van Andel Symposium Co-Chair, Tumor Suppressors and Cell Death
2006 St. Jude Seminars, Memphis, TN
2006 MichBio Student Career Day, Grand Rapids, MI
2006 RNAi 2006 Webcast
2007 Michigan State University Quantitative Biology and Modeling Seminar
2007 Apoptosis in Drug Discovery/Stem Cell Research and Therapeutics, San Diego
2007 Professional Advancement Series, AACR Annual Meeting, Los Angeles, CA
2007 Town Hall Meeting, AACR Annual Meeting, Los Angeles, CA
2007 Midwest Conference on Systems Biology, East Lansing, MI
2007 Applications in Chemical and Functional Genomics, Baltimore, MD
2008 Michigan Prostate Research Colloquium, Van Andel Research Institute
2008 Blue Cross Blue Shield of Michigan Corporate Summer Meeting, Grand Rapids

2008 Translational Genomics (TGen) Seminars, Scottsdale, AZ
2008 West Michigan Regional Undergrad Conference, Grand Rapids, MI
2009 RNAi World Congress Conference, Boston, MA
2009 Origins of Human Cancer Symposium, VARI (*Co-Organizer*)
2010 American Cancer Society and US Postmasters Annual Convention, Grand Rapids
2011 Systems Biology Symposium, University of Michigan, Ann Arbor, MI
2011 Roundtable Mentor Grant Writing Workshop, 102nd Annual AACR, Orlando, FL
2011 Medical Grand Rounds Mary Free Bed Rehabilitation Hospital, Grand Rapids, MI
2011 Help on the Hill, Van Andel Institute, Grand Rapids, MI
2011 Oncology Research Seminar Series at Eli Lilly Corporate Center, Indianapolis, IN
2011 Medical Grand Rounds, Saint Mary's Health Center, Grand Rapids, MI
2011 Life Science Luncheon, Van Andel Institute, Grand Rapids, MI
2011 Autophagy Conference, Puerto Morelos, Mexico
2012 Spectrum Health – Digestive Disease Institute, Grand Rapids, MI
2012 West Michigan Neurological Society, Grand Rapids, MI
2012 Tuberous Sclerosis Alliance, Silver Spring, MD
2012 Federation of American Societies for Experimental Biology, Snowmass Village
2012 Grand Challenges in Parkinson's Disease Symposium, VARI, Grand Rapids, MI
2012 Life Science Luncheon, Van Andel Institute, Grand Rapids, MI
2012 Multi-Scale Modeling in Biology Workshop, Los Alamos National Labs, NM
2012 Hope Academy of Senior Professionals, Hope College, Holland, MI
2012 Michael J. Fox Foundation Research Team Meeting, New York, NY
2012 Bristol-Myers Squibb Advisory Board Meeting, Atlanta, GA
2012 Translational Genomics (TGen) Seminar Series, Phoenix, AZ
2013 Merck Oncology, Boston, MA
2013 Aquinas College, Grand Rapids, MI
2013 Tuberous Sclerosis Alliance Board Meeting Presentation, Washington DC
2013 Life Science Luncheon, Van Andel Institute, Grand Rapids, MI
2013 Tuberous Sclerosis Alliance Regional TSC Conference, VARI, Grand Rapids, MI
2013 Great Lakes Scrip Center Summer Conference Event, VARI, Grand Rapids, MI
2013 J-Board Annual Dinner, Van Andel Research Institute, Grand Rapids, MI
2013 Van Andel Institute National Awareness Initiative, Menlo Park, CA
2013 Van Andel Institute National Awareness Initiative, Santa Barbara, CA
2013 Van Andel Institute National Awareness Initiative, Chicago, IL
2013 Van Andel Institute National Awareness Initiative, New York, NY
2013 Michael J. Fox Foundation Research Team Meeting, New York, NY
2013 Best of ASCO (American Society of Clinical Oncology), Los Angeles, CA
2013 *Purple Community* Leadership Academy, Grand Rapids, MI
2013 Helen DeVos Children's Hospital Grand Rounds, Grand Rapids, MI
2013 Ontario Cancer Institute, Toronto, Canada
2014 Van Andel Institute National Initiative, Bluffton, SC
2014 Van Andel Institute National Initiative, Washington, DC
2014 Keynote, World TSC Conference, Washington, DC
2014 Michigan Chapter TSC, Grand Rapids, MI
2014 Great Lakes Biorepository Network (GLBRN), Grand Rapids, MI
2015 J Board, Lunch and Learn, Grand Rapids, MI
2015 VAI-University of Michigan Translational Oncology Program, Grand Rapids, MI

2015 VAI All-Staff Meeting, Accelerating the Speed of Research, Grand Rapids, MI
 2015 Medical Mile Impact Meeting, Project Medical Education, VARI
 2015 Building Hope, Wilcox Estate, East Grand Rapids, MI
 2015 TSC Biosample and Preclinical Research Workshops, VARI, Grand Rapids, MI
 2015 Michael J. Fox Foundation Research Team Meeting, New York, NY
 2015 11th Annual Angioma Alliance Scientific Meeting, Washington, DC
 2015 VAI-Around the World Event, Grand Rapids, MI
 2015 Center for Molecular Medicine and Genetics, Wayne State University, Detroit, MI
 2016 The Goldstein Symposium on Cell Signaling, Santa Fe, NM
 2016 Targeting Autophagy in Cancer, Boston, MA
 2016 Translating Cancer Genomics, Boston, MA
 2016 Genomic Landscape of Tuberous Sclerosis Complex, Michigan State Univ.
 2017 Targeting Autophagy in Cancer, Focus on the Immune System, Newark, NJ
 2017 2016 Nobel Prize in Medicine – Translational Impact, Aquinas College
 2017 Epigenetics and Autophagy, Grand Rapids, MI
 2017 International Research Conference on TSC and LAM, Washington, DC
 2017 Targeting Autophagy Symposium, Focus on Drug Discovery, Boston, MA
 2017 MSU Rx – Grand Rapids, MI (*TEDx format*)
 2017 MSU Pediatric Grand Rounds, East Lansing, MI
 2018 Rare Disease Day Symposium, Calvin College, Grand Rapids, MI
 2018 The Ethics of Genome Editing, DeVos Medical Ethics Colloquy, GVSU
 2018 AACR Annual Meeting, Chicago, IL
 2018 Cancer Research Network, Michigan State University
 2018 Aquinas College, Grand Rapids, MI
 2018 Understanding and Modulating Autophagy Pathways for Drug Discovery, Boston

RADIO AND NEWS ARTICLES

2006-2016

Last generation of cancer researchers? *Oncology Times* 28(9): 16, 17. May 10, 2006, by Eric T. Rosenthal.

Nature Jobs Careers Expert column, August 1, 2006, by Deb Koen.

WGVU National Public Radio (NPR) Morning Show, Nov 21, 2007 by Shelly Erwin

One year later—AACR (no-longer-so-) young scientists share personal stories of post-doctoral careers. *Oncology Times* 29(11): 27–28. June 10, 2007, by Eric T. Rosenthal

WGVU National Public Radio (NPR) Morning Show, May 21, 2008 by Shelly Erwin

WGVU National Public Radio (NPR) Morning Show, October 21, 2009 by Shelly Erwin

Eight West, NBC-Wood TV Parkinson's Disease Winterfest Celebration, February 11, 2010 by Rachael Ruiz and Terry DeBoer

Eight West, NBC-Wood TV Parkinson's Disease Winterfest Celebration, February 10, 2011, by Rachael Ruiz and Terry DeBoer

WGVU National Public Radio (NPR) Morning Show, February 16, 2011 by Shelly Erwin

Lowering enzyme could fight cancer. NBC-Wood TV, Grand Rapids by Rachael Ruiz

Local research advances fight against cancer. ABC-WZZM TV, Grand Rapids by Val Lego
Fox 17 Morning Show, Community for a Cure, GVSU vs. Ferris by Emily Richett
WGVU - Ask the Scientist Television Program, Grand Rapids by Shelly Erwin
Researchers examine how genes and proteins affect therapeutic treatments, July 7, 2011
Michael J. Fox Foundation sponsors work to reposition current drugs, July 29, 2011
WGVU Midday West Michigan, interviewed by David Moore on August 1, 2011
WGVU National Public Radio (NPR) Morning Show, August 17, 2011 by Shelly Erwin
Combination drug therapy urged to battle lung cancer, February 2, 2012
WGVU Midday West Michigan, interviewed by David Moore on February 8, 2012
WGVU National Public Radio (NPR) Morning Show, December 19, 2012 by Shelly Erwin
VAI Begins "Pathway of Hope" Research Initiative in Rare Tumor Disorders, Feb 18, 2013
WGVU Midday West Michigan, interviewed by David Moore on February 20, 2013
Scientists Model Complex Cancer Cell Behavior, March 14, 2013
Huffington Post Science Blog - Thinking Outside the Box to Make Significant Advances in
Disease Research Posted: 05/03/2013
Eight West, NBC-Wood TV, *Purple Community*, May 28, 2013 by Rachael Ruiz
Eight West, NBC-Wood TV, *Purple Community*, June 4, 2013 by Rachael Ruiz
Pathway of Hope Initiative Achieves Important Research Milestones, May 14, 2014
Cancer Study Offers a Resource on More Than 1,000 Human Genes, May 19, 2014
Van Andel researchers aim to help kids fight rare disease, Sue Thoms, May 26, 2014
Fox 17 News with Carol Van Andel, Couture for a Cure/TSC research, October 6, 2014,
interviewed by Michele Deselms
NewsTalk 1340 WJRW, Couture for a Cure/TSC research, October 7, 2014
Storytelling Pictures video for TSC research, October 9, 2014
Los Alamos National Labs, New Release, September 14, 2015
MSU and VARI on Cusp of Slowing Progression of Parkinson's, MSU Today, Nov 1, 2016
by Geri Kelley, Sarina Gleason, Pat Shellenbarger

2017–date

Research Offers New Clues to Rare Genetic Disease, MSU Today, June 30, 2017 by Geri
Kelley, Pat Shellenbarger

MSU Rx Brings Thought-Provoking and Inspirational Talks, MSU Today, Oct. 18, 2017 by
Amy Nienhouse and Sarina Gleason

TEACHING EXPERIENCE

- 2000 MCRO 255: Elementary Pathogenic Microbiology, Univ. of North Carolina, Teaching Assistant
- 2007 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2008 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2008 VAI 809: Parkinson Disease module, Strategic Approaches to Biomedical Research VAI Graduate School, Co-Instructor
- 2009 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2009 VAI 809: Parkinson Disease module, Strategic Approaches to Biomedical Research VAI Graduate School, Co-Instructor
- 2009 BMB 495: Modern Biochemistry, Michigan State University, Co-Instructor
- 2009 BMB 802: Advanced Metabolism and its Regulation, Michigan State University
- 2010 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2010 BMB 802: Advanced Metabolism and its Regulation, Michigan State University
- 2010 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2011 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2011 BMB 802: Advanced Metabolism and its Regulation, Michigan State University
- 2011 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School
- 2011 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2012 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2012 BMB 802: Advanced Metabolism and its Regulation, Michigan State University
- 2012 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School
- 2012 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2013 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2013 BMB 802: Advanced Metabolism and its Regulation, Michigan State University
- 2013 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School
- 2013 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2014 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2014 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School
- 2014 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2015 VAI 821: Historical Perspectives in Molecular Biology, VAI Graduate School
- 2015 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School
- 2015 VAI 8091: SABR-Brain Tumors, VAI Graduate School, Course Director
- 2016 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School, Course co-Director
- 2016 VAI 9013: Biochemistry of Chromatin, VAI Graduate School, Instructor
- 2017 VAI 8230: Responsible and Ethical Conduct of Research, VAI Graduate School, Course co-Director
- 2018 MSU PSL 950: Cancer Research Network, Topics in Physiology, Invited Lecture
- 2018 MSU CHM: Middle Clinical Experience – Women’s Health Rotational Groups

PERSONS MENTORED

Research staff

- 2004–2006 Maxime Magnier, research scientist, Novartis Institutes for BioMedical Research
- 2005–2006 Nga Tang, research scientist, Novartis Institutes for BioMedical Research

2005–2006 Mailin Van Hoosear, research associate, Novartis Institutes for BioMedical Research
 2006–2007 Natalie Niemi, research assistant, Van Andel Research Institute
 2007 Christina Ludema, research assistant, Van Andel Research Institute
 2008–2009 Michael Shaheen, medical student, Van Andel Research Institute
 2009 Carrie Gabrielse, senior research technician, Van Andel Research Institute
 2009–2013 Brendan Looyenga, research scientist, Van Andel Research Institute
 2009–2011 Elissa DeVos, assistant technician, Van Andel Research Institute
 2010 Ryan Davis, assistant technician, Van Andel Research Institute
 2010–2012 Audra Kauffman, laboratory manager, Van Andel Research Institute
 2010–2011 Danielle Hutchings, assistant technician, Van Andel Research Institute
 2010 Arjun Gopal, student intern, Van Andel Research Institute
 2011 Andrew Howard, student intern, Van Andel Research Institute
 2011–date Katie Martin, PhD, scientific project leader, Van Andel Research Institute
 2011–2012 Brett May, assistant technician, Van Andel Research Institute
 2011–date Nicole Doppel, research department administrator, Van Andel Research Institute
 2013 Aaron Putzke, visiting scientist, Hope College
 2013 Aaron Sayfie, assistant technician, Van Andel Research Institute
 2013–2014 Jennifer Kordich, MS, lab manager, Van Andel Research Institute
 2013–2016 Matt Kortus, MS, research associate, Van Andel Research Institute
 2013–2015 Jennifer Webb, clinical studies coordinator, Van Andel Research Institute
 2014–2017 Kellie Sisson, research associate, Van Andel Research Institute
 2014 Samuel Kerk, assistant technician, Van Andel Research Institute
 2015–2017 Joshua Schipper, PhD, research scientist, Van Andel Research Institute
 2015–date Stephanie Celano, research associate, Van Andel Research Institute/MSU
 2018–date Jess Guillaume, research assistant, Michigan State University

Undergraduate students

2007 Geoff Kraker, Calvin College
 2007 Joe Church, University of Notre Dame
 2007 Alyse DeHaan, University of Michigan
 2008 Cheri Ackerman, Calvin College
 2008 James Hogan, University of Michigan
 2008 Michael Shaheen, Michigan State University
 2009 Ryan Davis, Hope College
 2010 Danielle Hutchings, University of Michigan
 2011–2013 Anna Plantinga, Calvin College
 2011–2012 Aaron Sayfie, Hope College
 2015–2017 Megan Van Barren, Calvin College
 2015 William Hanrahan, Michigan State University
 2016 Leeland Dunwoodie, Clemson University
 2016 Annalise Bowen, Vanderbilt University
 2017 Mark Wolf, Calvin College
 2017 Jess Guillaume, Hope College

Graduate students

2006–2011 Katie Martin, Michigan State University
 2007–2012 Natalie Niemi, Van Andel Institute Graduate School

2009–2012 Jonathan Karnes, Van Andel Institute Graduate School
2009–2013 Megan Goodall, Michigan State University
2009–2013 Laura Westrate, Van Andel Institute Graduate School
2010–2015 Danielle Burgenske, Van Andel Institute Graduate School
2011 Jonathan Zande, Michigan State Medical School (rotation)
2012 Alexis Bergsma, Van Andel Institute Graduate School (rotation)
2013 Julienne Louters, Michigan State University (rotation)
2015–2016 Nanda Kumar Sasi, Michigan State University (advisor, Michael Weinreich)
2013–2017 Aditi Bagchi, MD, Van Andel Institute Graduate School
2013–2017 Nate Merrill, Van Andel Institute Graduate School
2014–2018 Abigail Solitro, Van Andel Institute Graduate School
2016–date Lisette Yco, Michigan State University

Postdoctoral fellows

2005–2006 Winfried Elis, PhD, Albert Ludwigs University,
Max Planck Institute for Immunobiology, Freiburg, Germany
2006–2009 Brendan Looyenga, PhD, University of Michigan
2009–2014 Nate Lanning, PhD, University of Michigan
2010–2013 Vanessa Fogg, PhD, Washington University in St. Louis
2012–2014 Juliana Sacoman, PhD, Michigan State University
2013–2014 Anita Bansal, PhD, Hudson Alpha Institute for Biotechnology
2014–2016 Kristin Dittenhafer-Reed, PhD, University of Wisconsin
2015–2016 Chun-Yuan (Lucas) Chan, PhD, University of New Mexico

PATENTS/COPYRIGHTS

Patent applications

PCT/US2006/033153; WO 2007/055773. Methods and reagents for the treatment of apoptosis-related disorders. 60/711,533 (filed August 26, 2005).
PCT/US2006/006346; WO 2006/091701. Methods and compositions for modulating cell death with survival or death kinases or phosphatases. 60/655,134 (filed February 22, 2006).
PCT/US2007/76934; WO 2008/027855. Compositions and methods for modulating mTOR signaling. 60/823,9721 (filed August 30, 2006).
PCT/US2010/033740; WO 2010/129681. Methods for treating autophagy-related disorders. 61/175,657 (filed May 5, 2010).
PCT/US2012/037158; WO 2012/154879. Autophagy Inhibitors. 14/116,650 (filed May 9, 2012).
PCT/US2014/366109. Autophagy Inhibitors. 61/913,321 (filed Dec 8, 2014).
PCT/US2014/946337. Autophagy Inhibitors. (filed Nov 19, 2015)

Patents

United States Patent, US 9,221,760 Autophagy Inhibitors.
Jeffrey Paul MacKeigan, Katie Renee Martin, Megan Lynne Goodall, Stephen Gately, and Tong Wang. Assigned to Van Andel Research Institute and Translational Genomics Research Institute (Awarded, December 29, 2015)

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Identification and Modulation of Molecular Targets Crucial for Drug-Induced Cancer Cell Death. 2002. University of North Carolina Dissertation.

BIBLIOGRAPHY

1. Niven, R., R. Pearlman, T. Wedeking, **J. MacKeigan**, P. Noker, L. Simpson-Herren, and J.G. Smith. Biodistribution of radiolabeled lipid-DNA complexes and DNA in mice. *J. Pharm. Sci.* 1998; 87(11):1292–1299.

Graduate Studies at the University of North Carolina (1998-2002)

2. **MacKeigan, J.P.**, T.S. Collins, and J.P. Ting. MEK inhibition enhances paclitaxel-induced tumor apoptosis. *J. Biol. Chem.* 2000; 275(50):38953–38956.
 - Important insights for the development in mitogen-induced extracellular kinase (MAPK/MEK) inhibitors, and combination therapy in the treatment of cancer.
 - Over 191 citations from *Web of Science*, previewed in *Breast Cancer Research* and 30 additional reviews.
3. **MacKeigan, J.P.**, D.J. Taxman, D. Hunter, H.S. Earp, L.M. Graves, and J.P. Ting. Inactivation of the antiapoptotic phosphatidylinositol 3-kinase-Akt pathway by the combined treatment of Taxol and mitogen-activated protein kinase kinase inhibition. *Clin. Cancer Res.* 2002; 8(7):2091–2099.
 - Important proteomic insights for the development in phosphatidylinositol 3-kinase (PI3K) inhibitors, combination therapy, and targeted therapy in the treatment of cancer.
4. Taxman, D.J., **J.P. MacKeigan**, C. Clements, D.T. Bergstralh, and J.P. Ting. Transcriptional profiling of targets for combination therapy of lung carcinoma with paclitaxel and mitogen-activated protein/extracellular signal-regulated kinase kinase inhibitor. *Cancer Res.* 2003; 63(16):5095–5104.
5. **MacKeigan, J.P.**, C.M. Clements, J.D. Lich, R.M. Pope, Y. Hod, and J.P. Ting. Proteomic profiling drug-induced apoptosis in non-small cell lung carcinoma: identification of RS/DJ-1 and RhoGDI α . *Cancer Res.* 2003; 63(20):6928–6934.
 - Over 145 citations from *Web of Science*

Postdoctoral Training at Harvard Medical School (2003-2004)

6. Murphy, L.O., **J.P. MacKeigan**, and J. Blenis. A network of immediate early gene products propagates subtle differences in MAPK signal amplitude and duration. *Mol. Cell. Biol.* 2004; 24(1):144–153.
 - The strength and duration of mitogen-activated protein kinase signaling have been shown to regulate cell fate in different cell types. In this study, a general mechanism is described that explains how subtle differences in signaling kinetics are translated into a specific biological outcome.
 - Over 214 citations from *Web of Science*
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RESEARCH SUPPORT (as of May 1st, 2018)

The laboratory has been awarded and/or completed research on 27 externally funded Research Grants in the last 12 years.