

Margaret H. Wilch

**Director of Research
S.T.A.R. Lab Program
Director AZ JSHS**

4574 E. Broadway Blvd. Tucson AZ, 85711

Educational Degrees:

Honorary Ph.D. University of Arizona College of Science, May 2012

M.S. General Biology, University of Arizona, Tucson, Arizona
Biochemistry Department. August 12, 1999; Professor Nancy Moran, P.I.
Thesis: “Predation and prey response in the galls of *Pemphigus populiramulorum*”

Post-Bachelor Secondary Science Education Certification: Biology University of Arizona, December 1991

Bachelor of Special Studies: Biology, Cornell College, Mt. Vernon, Iowa. May 1979

Employment:

Director of Research, Southern Arizona Research Science and Engineering Foundation (SARSEF): A non-profit organization supporting STEM education and student research. July 2019 to present

Program Coordinator for MCB 101/102 Dual Enrollment, The BIOTECH Project, Molecular and Cellular Biology, University of Arizona. Monitor statewide high school student enrollment in dual credit biotech classes. November 2018 to 2019

Arizona Science Teachers Association: *A Deeper Dive: Constructing 3-Dimensional Units*. Program assistant for state wide training of 3-dimensional teaching using the new Arizona Science Standard June 2019-2020 Contract work

Mentor for STEMAZing Teacher Leadership Program, Office of the Pima County School Superintendent, August 2018 to 2020 Contract work

Science Teacher: Biology, A.P. Environmental Science, Biotechnology and Honors Research Methods, Tucson High Magnet School, Tucson Unified School District, 400 N. 2nd Ave. Tucson, Arizona 85705. August 1992 to June 2018

Co-Instructor of “Selected Topics for Science Educators ECOL/GEO 596S”, University of Arizona. Course for teachers in conjunction with the University of Arizona’s College of Science Public Lecture Series 2006- 2019

BLAST Director & Co-Instructor of summer course “Genes, Biotechnology and the Environment”; Biotechnology Laboratory for Arizona Students and Teachers, Tucson High Magnet School. Nancy Moran Ph.D., Regents Professor, P.I. 2006-2011, Elizabeth A. Arnold, P.I. 2015-2017

Director of Science and Nature in Tandem for Youth (SANITY). Created and developed immersive 10-day summer field biology internship for high school teachers and students. Program is institutionalized at Tucson High and continues to offer high school student authentic field research experience. Tucson High Magnet School & Southwestern Research Station, Portal AZ 2006-2018

Academic Coach, Math and Science Tutoring Resource (MASTR), University College, University of Arizona. August 2006 to 2009

Fellowships, Collaborations & Internships:

“Bringing Microbiology & Water Quality to Arizona Classrooms- Workforce Development through Teacher Training”, National Institute of Food and Agriculture, USDA Grant; P.I.s Jeannie McClain, Environmental Sciences and Kerry Schwartz, Water Research Resources, University of Arizona, Summer 2019-2021

NSF Grant Student Outreach collaboration “Antifungal protection of eggs by maternal cloacal microbiota” Stacey Weiss and Mark Martin co-PIs University of Puget Sound, Tacoma WA May 2017-2019

I-HELP Liberia Science and Math Teacher Training Workshop. Led Biology Workshop for 40 Liberian biology teachers. Organized first Liberian Science Fair for all workshop participants: math, physics, chemistry and biology teachers, 83 total. In addition to updating biology content and instructional practices, teachers engaged in developing relevant research questions that could be investigated using locally available materials. Ghanta, Liberia. June 25- July 8, 2017

BLAST Outreach Collaboration: A. Elizabeth Arnold Lab, School of Plant Science, University of Arizona. I worked with Dr. Arnold and her team of researchers worked to teach high school students and teachers from across southern Arizona how to use microbiology and molecular techniques to conduct research in fungal ecology. June 2015 to 2017

SANITY Outreach Collaboration: A. Elizabeth Arnold Lab, School of Plant Science, University of Arizona. Dr. Arnold and her team of researchers work with THMS students in the opening day of the THMS SANITY Program to demonstrate scientific process and investigate Mycorrhizae interactions with tree roots in the Chiricahua Mountains, SWRS, Portal, AZ. May 2014 to 2019

HEATWAVES Fellowship: NSF Funded GK-12 Fellowship in Engineering, Professor Kim Ogden P.I., School of Engineering, University of Arizona 2014-2015

NSF Research Experience for Teachers, Noah Whiteman PI; Mediation of plant-herbivore interactions by foliar bacterial endophytes: A test using a native *Pseudomonas*-mustard-insect interaction system, Rocky Mountain Biological Laboratory, Gothic CO, July 2013 & 2015

NSF Research Experience for Teachers, A. Elizabeth Arnold PI; Dimensions of Biodiversity: Collaborative Research: An Interdisciplinary Study of Hyperdiverse Fungal Endophytes and Their Function in Boreal Forests. Explore tropical seed defense mechanisms with field research experience in Barro Colorado, Panama June 2012, 2013 and 2015

Arizona Partners in Science Supplemental Award: Exploring Endophytic Fungi Diversity and Abundance. Professor A. Elizabeth Arnold collaborator, 2012-2013

G-TEAMS Fellowship: NSF Funded GK-12 Fellowship in Mathematics, Professor Joceline Lega P.I., Department of Mathematics, University of Arizona 2012-2013

UA Galapagos Marine Ecology, BioMe Funded Teacher Research and Ecology Course: Three-week exploration of Galapagos Islands educational system, natural environments and biodiversity, July 2008

BioMe Fellowships (6 years): NSF Funded GK-12 Fellowship: Biodiversity from Molecules to Ecosystems. Professor Judie Bronstein, P.I., BIO5 University of Arizona. 2007-2012

Toyota Tapestry Grant \$10,000 awarded: "Capturing Sunshine, Rainfall and Imaginations in the Desert. Established water harvesting and fundamentals of Farm and Garden at Tucson High Magnet School 2011-2012 Established school garden at THMS

Arizona Partners in Science Award, Research Corporation. "Exploration of the Microbiota Associated with Honey Pot Ants, *Myrmecocystus* species, using DNA sequencing methods". Professor Nancy Moran, P.I. 2009-2011

PREP Fellowship: Partnership for Research and Education in Plants, Department of Molecular and Cellular Biology, University of Arizona Frans Tax P.I. Arabidopsis genetic research and curriculum development. 2005

NSF Teacher Internship in Plant Genomics, Department of Molecular and Cellular Biology, University of Arizona. Elizabeth Vierling P.I.; Acquired thermotolerance in *Arabidopsis*. 2003 & 2004

NSF Teacher Internship in Plant Genomics, Plant Sciences Department, University of Arizona. Vicki Chandler P.I.; Paramutation mutants that reactivate silent transgenes in maize. 2002

Honors & Awards:

Top High School Teacher: Southern Arizona Regional Science and Engineering Fair, Tucson AZ 1998-2000, 2004-2017

Arizona Junior Science and Humanities Symposium Science Teacher Award Arizona State University. 2002, 2004, 2005, 2008, 2011, 2015

Finalist Presidential Award of Excellence for Math and Science Teaching Arizona State 2012- 2013

Top High School Teacher: Arizona Science and Engineering Fair 2010, Phoenix Az

Top High School Award: Arizona Science and Engineering Fair 2009, Phoenix, Az

Arizona Bioscience Educator of the Year: Arizona Bioscience Industries 2008

Finalist Arizona Athletics and Circle K Outstanding High School Faculty 2005-06

Arizona Math/Science Teacher of the Year: High Technology Industry Cluster of the Governor's Strategic Partnership for Economic Development; Governor Jane Dee Hull, 2000

Achievements:

39 ISEF finalists were selected to attend the International Science and Engineering Fair from my Honors Research Methods Program. One or more of my students were selected to compete internationally each year from 1999-2018. Many students won awards at ISEF including Best of Category in Zoology and several first and many second and third place awards.

Aaron P. Roznowski, Robert J. Young, Samuel Love, Avenetti A. Andromita, Vanessa Guzman, Margaret H. Wilch, Ava Block, Anne McGill, Martine Lavelle, Anastasia Romanova, Aimi Sekiguchi, Meixiao Wang, April D. Burch, and Bentley A. Fane. Recessive host range mutants and unsusceptible cells that inactivate virions without genome penetration: ecological and technical implications; *The Journal of Virology*, In press Nov 2018

Nicholas C. Massimo & M. M. Nandi Devan & Kayla R. Arendt & Margaret H. Wilch & Jakob M. Riddle & Susan H. Furr & Cole Steen & Jana M. U'Ren & Dustin C. Sandberg & A. Elizabeth Arnold. Fungal Endophytes in Aboveground Tissues of Desert Plants: Infrequent in Culture, but Highly Diverse and Distinctive Symbionts; *Microbial Ecology* Published on line Feb 03, 2015

Presenter: National Science Teacher Association National Conference, Short Course Presentation: "SANITY, BLAST and Research Methods: Programs that Engage Students in Science!", Phoenix AZ Dec 6, 2012

Poster presentation "Searching for bacterial endosymbionts in Honey pot ants, *Myrmecocystus mendax*", Annual Partners in Science Conference, San Diego, CA January 15-16, 2010

Featured as Biotechnology Teacher in Cool Careers in Biotechnology, Sally Ride Science Publications. 2009

Lead teacher: AzSTEM Evolution Short Course. Organized workshops and presentations for short course on evolution. Biosphere 2, University of Arizona, Oracle AZ February 13-15, 2009

Mangin, K.L., Thompson, R.M., Wilch, M., and Gori, D.F. (2006), Teachers learning to teach science by doing science at the University of Arizona, EOS Trans. AGU, 87(52), Fall Meet. Suppl., Abstract MR21B-0018 2006

Presenter: National Conference for the American Association for the Advancement of Science (AAAS) "How to develop a research program in a public high school" St. Louis, MO February 16-20, 2006

Service

Member of the Board of Directors, Southern Arizona Research Science and Engineering Foundation (SARSEF), 2000-2019.

Invited External Reviewer, Community member, Academic Program Review Committee for the University of Arizona Department of Ecology and Evolutionary Biology, University of Arizona, February 2017

Invited External Reviewer, Community member, Academic Program Review Committee for the University of Arizona Department of Neuroscience and Undergraduate Program in Neuroscience and Cognitive Science, University of Arizona November 3 & 4, 2016

United States Environmental Protection Agency National Environmental Education Advisory Council Member 2008-09

Cooper Educational Advisory Committee, Cooper Center for Environmental Learning University of Arizona & Tucson Unified School District 2008-2009

Professional Organizations:

National Science Teachers Association
Arizona Science Teachers Association
American Association for the Advancement of Science
National Biology Teachers Association