

CURRICULUM VITAE – Jan 2019

NANCY M. BONINI

Department of Biology
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Education & Training:

- 1981 A.B. Biology, Princeton University
Undergraduate thesis advisor: Dr. William G. Quinn, Department of Biology
Project: Learning behavior in *Drosophila*.
- 1987 Ph.D. Neuroscience, Neurosciences Training Program, Univ. of Wisconsin-Madison
Graduate thesis advisor: Dr. David L. Nelson, Department of Biochemistry
Project: Regulation of ciliary motility by membrane potential in *Paramecium*.
- 1983 Cold Spring Harbor summer course “Molecular and Cellular Neurobiology”
- 1988 Cold Spring Harbor summer course “Neurobiology of *Drosophila*”
- 1988-1994 Research Fellow in Biology, California Institute of Technology.
Postdoctoral Advisor: Dr. Seymour Benzer, Division of Biology
Project: Molecular control of cell survival in the nervous system.
- 2008 Cold Spring Harbor summer course “*C elegans*”

Positions:

- 1994-2000 Assistant Professor, Department of Biology, University of Pennsylvania
- 1995- Member of David Mahoney Institute for Neurological Sciences
- 2000-2005 Associate Professor, Department of Biology, University of Pennsylvania
- 2000- Department of Neuroscience, University of Pennsylvania Medical School, Secondary Faculty Appointment
- 2000-2013 Investigator of the Howard Hughes Medical Institute
- 2005- Professor, Department of Biology, University of Pennsylvania
- 2006-2012 Lucille B Williams Term Professor of Biology, University of Pennsylvania
- 2009-2014 Member of the Penn Genome Frontiers Institute
- 2012- Florence RC Murray Professor of Biology, University of Pennsylvania
- 2012- Member of the Institute of Regenerative Medicine, Neuroscience Program
- 2013- Cell and Developmental Biology Department, University of Pennsylvania Medical School, Secondary Faculty Appointment
- 2013- Affiliate Scientist, Lawrence Berkeley National Laboratory, Dept of Genome Dynamics
- 2014 (Feb) Visiting scientist, Salk Institute, Plant Biology & Human Genomics Ecker Lab
- 2014-2017 Associate Member, Computational and Integrative Biology Center, Rutgers University Camden, NJ
- 2018(Feb) Visiting scientist, Salk Institute, Plant Biology & Human Genomics Ecker Lab

Honors & Awards:

- 1983 Grass Foundation Fellowship CSH, for summer course “Molecular & Cellular Neurobiology”
- 1988 Jerzy E. Rose Neuroscience Award for Research in the Neural Sciences, University of Wisconsin-Madison, for PhD thesis work.
- 1988 CSH Laboratory scholarship, for summer course “Neurobiology of *Drosophila*”
- 1989 American Cancer Society postdoctoral fellowship
- 1991 American Cancer Society postdoctoral fellowship, California Division
- 1995 John Merck Scholars Award in the Biology of Developmental Disabilities in Children

1996	March of Dimes, Basil O'Connor Award
1997	Alzheimer's Association Award
1997	David and Lucile Packard Fellowship for Science and Engineering
1998-2000	Huntington's Disease Society of America, Coalition for the Cure Award
1999-2001	Hereditary Disease Foundation, Cure Huntington's Disease Initiative Award
2000	Investigator of the Howard Hughes Medical Institute, national competition
2001, 2002	G. William Fox Corporate Humanitarian Award
2002	Princeton Day School Achievement Award, Princeton, NJ, outstanding achievement
2008	Fidelity Foundation Award
2009	NIH EUREKA (Exceptional, Unconventional Research Enabling Knowledge Acceleration)
2009	Ellison Medical Foundation Senior Scholar in Aging Research
2012	Elected Fellow of the American Association for the Advancement of Science
2012	Elected Member of the National Academy of Sciences
2012	Elected Member of the National Academy of Medicine
2014	Elected Fellow of the American Academy of Arts and Sciences
2015	Glenn Award for Research in the Biological Mechanism of Aging
2016-2017	Excellence in Teaching Award, Dept Biology, University of Pennsylvania

Major Meeting Organizer:

2000	Co-organizer, 12 th National Academy of Sciences Symposium <i>Frontiers of Science</i> , November
2001	Co-organizer of the Neurobiology of Disease Workshop on Triplet Repeat Diseases, Society for Neuroscience, November
2003	Co-organizer Society for Developmental Biology Mid-Atlantic Meeting, May
2006	Co-organizer, Parkinson's Disease: Insights from Genetic and Toxin Models, Banbury Center, Cold Spring Harbor Laboratory, May
2005	Session organizer, Cold Spring Harbor Laboratory <i>Drosophila</i> Neurobiology Meeting, for session entitled "Neuronal Cell Biology and Pathology," October
2006	Organizing Committee, 1 st International Parkinson's Disease World Congress Meeting
2008	Co-organizer, 49 th Annual <i>Drosophila</i> Research Conference, April
2011	Co-organizer, Cold Spring Harbor Laboratory meeting on "Neurobiology of <i>Drosophila</i> ", October
2016	Co-organizer, 57 th Annual <i>Drosophila</i> Research Conference. Launch of a new meeting format, with integrated genetics meetings of multiple systems, including mouse, <i>C elegans</i> and zebrafish.

Scientific & Review Boards:

1995-1997	Council Member Society for Neuroscience, Philadelphia Chapter
2001-2002	Neurobiology of Disease Advisory Committee, Society for Neuroscience
2001-2003	Coalition for the Cure Steering Committee, Huntington's Disease Society of America
2002-2004	Member of the NINDS Scientific Review Council
2004-2008	Medical & Scientific Advisory Committee, Huntington's Disease Society of America
2004-2008	Coalition Review Committee, Huntington's Disease Society of America
2004-2008	Grants and Fellowships Review Committee, Huntington's Disease Society of America
2004-2007	Janelia Farms Group Leader Search Committee, Howard Hughes Medical Institute
2005	Scientific Advisory Board for the Thomas Hartman Foundation Cold Spring Harbor Laboratory Parkinson's Research Partnership
2005	Reviewer, Taube Prize for Huntington's Disease Research, for Institute of Neurodegenerative Diseases of the University of California
2005-2009	Member of Cellular and Molecular Neurodegeneration (CMND) study section, NIH
2007-2009	Genetics Society of America, Board of Directors
2007-2010	Scientific Advisory Board member, Genome Espana, Cetegen, Spain
2010-2013	National <i>Drosophila</i> Board
2010	VIB Review Board, Department of Molecular and Developmental Genetics, Belgium
2011-	Scientific Review Board, National Ataxia Foundation
2012-	Scientific Research Advisory Board, Project A.L.S
2012-	Scientific Advisory Board for the Bloomington <i>Drosophila</i> Stock Center

- 2012-2016 Scientific Review Board, The Telethon Foundation, Italy
 2016 Class Membership Committee (CMC), Class II, National Academy of Sciences.
 2016 Scientific Reviewer, Howard Hughes Medical Institute International Predoctoral Fellowships.
 2016 Theme Selection Committee for the 2018 Bower Award and Prize for Achievement in Science, The Franklin Institute, Philadelphia, PA
 2017 Richard Lounsbery Award Jury Selection Committee, for the National Academy of Sciences
 2017- Scientific Advisory Board, Glenn Foundation for Medical Research
 2017- *Drosophila* Image Award Committee Member, Genetics Society of America
 2018- Life Sciences Committee for the Franklin Awards, The Franklin Institute, Philadelphia, PA
 2018-2019 Organizing committee, Year of Neurodegenerative Disease, Mahoney Institute of Neurosciences, University of Pennsylvania Perelman School of Medicine.

Editorial Positions:

- 2004-2007 Associate Editor, Journal of Neuroscience
 2010-2012 Associate Editor, Journal of Clinical Investigation
 2005-2015 Editorial Board, Annual Reviews of Genetics
 2015-2016 Guest Editor, Disease models and Mechanisms, with Norbert Perrimon
 2016-2017 Guest Editor, Current Opinion in Developmental Genetics, with Allen Roses.
 2016- Editorial Board, Disease Models and Mechanisms
 2016- Editor, Annual Reviews of Genetics

Federal Advisory and Other National Service:

- 2002-2004 Member of the NINDS Scientific Review Council
 2005-2009 Member of CMND study section (formerly NDBG)
 2009, 2011 Reviewer for NIH Pioneer Awards
 1994- Ad-hoc reviewer NEI, NINDS, NIA, Pioneer grants, Transformative grants.
 2015 Ad-hoc member of MNG Molecular Neurogenetics study section.
 2016-2020 Member of MNG Molecular Neurogenetics Study Section
 2018-2020 Chair, MNG Molecular Neurogenetics Study Section

Scientific Society Memberships

American Association for the Advancement of Science
 American Physiological Society
 American Society for Biochemistry & Molecular Biology
 American Society for Cell Biology
 Genetics Society of America
 International Society for Frontotemporal Dementias, Founding Member
 Society for Neuroscience

Educational Mission to the University:

- 1994-1997 (fall) Biology 101: Introductory Biology, Course Co-Director (~200 students)
 1996-2000 (sp) Biology 540: Genetic systems (~30 students), Course Developer & Director
 2000 Co-Developer Biology special concentration "neurobiology"

 1994-present Biol399/499 Undergraduate Independent Study (5-10 students/ semester)
 1994-present Biology Undergraduate Advisor
 1999-present (fall) Biology 221: Molecular Biology and Genetics (~100 students), Course Co-Director.
 2004-present (fall) Biology 527: Advanced Molecular Biology and Genetics (~5 students), Bio 221 lectures, plus additional reading & writing assignments
 2014-present (fall) Biology 466: Molecular Genetics of Neurological Disease (~15 students), Course Developer & Director
 2014-present Developer & Director of Biology special concentration "Mechanisms of Disease"

Patents and Disclosures:

- US patent Application No 12/965,618, July 2011, UPenn Docket No W5390US
Compositions and methods for the diagnosis and treatment of Amyotrophic Lateral Sclerosis
- US patent Application/not being pursued NO. 61/547,594, Oct 2012, UPenn Y6028.
Trimmer-mediated microRNA processing
- Disclosure Reference Y6128, Dec 2011
Novel fly wing model for acute neural injury.
- Disclosure Reference X5985, June 2011
miR-34 modulation with anti-aging and anti-neurodegenerative therapeutic applications
- Disclosure Oct 2016
Device to produce traumatic brain injury in model organisms
- Disclosures Aug 2018
Inhibitors of PARP5a and PARP-5b activity in the treatment of ALS and FTD
Inhibitors of PARP1 and PARP-2 activity in the treatment of ALS and FTD

Plenary, Symposia & Distinguished Lectures

- 1995 Gordon Research Conference on Cell Death, July
- 1996 13th Annual Neuroscience Retreat Symposium, U Penn Medical School, April
- 1997 Drosophila Research Conference, Workshop on Aging, Washington, DC
- 1997 Developmental Biology Symposium, Department of Cell and Molecular Biology, University of Pennsylvania Medical School, Sept
- 1998 XIII International Congress on Eye Research, Symposium
"Responsible genes for early development of the eye," Paris, France, July
- 1998 The Royal Society, London, Symposium on Glutamine Repeats & Inherited Neurodegenerative Diseases: Molecular Aspects, October
- 1999 FASEB conference Amyloids and Other Protein Misfolding Processes, Copper Mountain, CO, June
- 1999 American Society for Cell Biology, 39th Annual Meeting, Symposium
Cellular Degeneration and Disease, Washington DC, December
- 1999 National Academy of Sciences, 11th annual symposium on *Frontiers of Science*, Polyglutamine Disease/Cell Death, November
- 1999 International Symposium on Parkinson's Disease Research, Sixth National Parkinson Foundation Meeting, Miami, Fla., Oct
- 1999 German Society of Genetics, Annual Meeting, Symposium, Neuherberg, Oct
- 2000 University of Tokyo, Symposium on Neural Development and Degeneration, Tokyo, Japan, Jan
- 2000 Society for Neuroscience, 30th Annual Meeting, Symposium organizer & speaker,
"Invertebrate models for human neurodegenerative disease," New Orleans, Nov.
- 2000 NIH Fly workshop program "Drosophila: Direct flight to understanding human disease and behavior," HHMI Conference Center, Chevy Chase, Maryland, Sept
- 2000 NINDS Retreat, Arlington, VA, July
- 2000 World Alzheimer's Congress 2000 event, 7th International Conference on Alzheimer's Disease and Related Disorders, Symposium speaker, Washington DC, July
- 2000 *Drosophila* Research Conference, 41st Annual Meeting, Plenary speaker, Pittsburgh, PA, March
- 2001 Gordon Research Conference on CAG Triplet Repeat Disorders, July
- 2001 American Academy of Neurology, "Genetics in Neurology", 53rd Annual Mtg, May
- 2001 University of Pennsylvania Neuroscience Retreat, April 19, 2001
- 2001 Workshop on "Molecular, Cellular and Clinical Aspects of Neurodegenerative diseases," Zermatt, Switzerland, January
- 2002 Adler Symposium, The Salk Institute, La Jolla, CA, January
- 2002 Sackler Colloquium on Self-perpetuating Structural States in Biology, Disease and Genetics, National Academy of Sciences, Washington, D.C., March
- 2002 Molecular Chaperones and the Heat Shock Response, Cold Spring Harbor Laboratory, May
- 2002 Pharmacia Symposium, Kalamazoo, MI, October

- 2002 Therapeutic Opportunities in Neurodegenerative Diseases, Cold Spring Harbor Lab, Dec
- 2003 Gordon Conference on Aging, Irvine, California, March
- 2003 "Genetics in Neurology", American Academy of Neurology, 55th Annual Mtg, Hawaii, May
- 2003 Queenstown Molecular Biology Meeting, Queenstown, New Zealand, August
- 2003 National Parkinson's Convention, 8th International, New Orleans, November
- 2004 Genetics Society of Australia, 51st Annual Conference, Melbourne, Australia, July
- 2004 Annual Meeting of the Swedish Society for Biochemistry & Molecular Biology, Linkoping University, Sweden, October
- 2004 Gerontological Society of America, Washington, DC, Nov.
- 2005 Onassis Lectures on "Programmed cell death and cell signaling in development and disease, Heraklion, Crete,
- 2005 Session Chair, Gordon Conference on CAG Triplet Repeat Disorders, Mt. Holyoke, July
- 2005 Scripps/Oxford International Biotechnology Conference Symp, Palm Beach, Florida, Nov.
- 2006 Speaker & organizer, Parkinson's Disease: Insights from Genetic and Toxin Models, Banbury Center, Cold Spring Harbor Laboratory, May
- 2006 Speaker & session chair, Keystone Symposium on Protein Misfolding Diseases: Mechanisms of Misfolding, Pathology and Therapeutic Strategies, Feb
- 2006 Swiss Society of Neuropathology biannual Meeting, St. Moritz, Switzerland, March
- 2006 Plenary, European Drosophila Neurobiology Meeting, Sept. 2-6, 2006
- 2007 Speaker & session chair, Keystone Symposium on Molecular Mechanisms of Neurodegeneration, Jan
- 2007 Franklin Institute Symposium in honor of Dr. Nancy Wexler, Franklin Life Sciences Award winner, Penn Department of Genetics, April
- 2007 Speaker, EMBO conference, The Biology of Molecular Chaperones, Tomar, Portugal, June
- 2007 Session leader, Gordon Research Conference, Oxford University, August
- 2007 Keynote Lecture, Protein misfolding and Neurological disorders symposium, Dunk Island, Australia, October
- 2008 Speaker, A Memorial to Seymour Benzer, Caltech, March
- 2008 Speaker, 2nd International Genome Dynamics & Neuroscience Meeting, Asilomar, June
- 2008 Speaker, RNA and the Etiology of Disease, Rome, Italy, June
- 2008 Speaker, 20th International Congress on Genetics, Berlin, Germany, July
- 2008 Zu Rhein Lecturer, Gabriele M. Zu Rhein Lecture, University of Wisconsin-Madison, Oct
- 2009 Speaker, 6th International Conference on Unstable Microsatellites and Human disease, Costa Rica, Jan
- 2009 Speaker, Research and Perspectives in Neurosciences, Fondation IPSEN, Paris, April
- 2009 Donders Lecturer, The Donders Institute for Brain, Cognition and Behaviour, The Radboud University Nijmegen Medical Centre, The Netherlands, May
- 2009 59th Annual Meeting of the American Human Genetics, Symposium on Model Organisms and Darwin's legacy, October
- 2010 Charlie Rose: The Brain Series with Eric Kandel—The Disordered Brain (guests Nancy Bonini, John Donoghue, John Krakauer, and Mahlon DeLong), July
- 2010 Penn Genomic Frontiers and the Franklin Institute public program "Genomics and Health: Cradle to Grave", March
- 2010 EMBO workshop, Proteolysis and Neurodegeneration, Organized by InProteolys, Spain, May
- 2010 OzBio2010, International Conference on "Molecules of Life: from discovery to Biotechnology" Melbourne, Australia, Oct
- 2010 7th International Conference on Frontotemporal Dementias, Oct
- 2011 Model Systems of Aging, Cologne, Germany, March
- 2011 European Society of Human Genetics, Amsterdam, May
- 2011 CAG Triplet Repeat Disorders Gordon Research Conference, June
- 2011 Keynote, Penn Genetics Symposium on Human Disease Models, Nov
- 2012 Keystone Symposium "Protein-RNA Interactions in Biology and Disease, March
- 2012 Keynote, Fourth Ataxia Investigators Meeting "Advancing Toward Therapeutics", San Antonio, Texas, March

- 2012 7th International Conference on Unstable Microsatellites and Human Disease, France, June
 2013 Plenary, 54th Annual Drosophila Research Conference, April
 2013 Colloquium on the Biology of Human Aging, Brown University, May
 2013 Ellison Meeting on the Biology of Aging, Woods Hole, Aug
 2013 SFN Satellite meeting RNA metabolism in Neurological Disease, Sept
 2014 Liu Lecturer, University of Pennsylvania School of Medicine, April
 2014 Welcome Trust Meeting, Translational Control of Brain Function in Health and Disease, July
 2014 Ellison Meeting on the Biology of Aging, Woods Hole, Aug
 2014 ALS/FTD Satellite Meeting, Society for Neuroscience, Nov
 2015 Simons Science Series Speaker, Simons Foundation, May
 2015 NIH workshop Neurocognition & Metabolism, July
 2015 41st Annual Yoga Research Society, Plenary Speaker, Oct, "Insights into Genetic Healing"
 2015 SFN Satellite meeting RNA metabolism in Neurological Disease, October
 2016 Templeton Foundation Meeting speaker, "Big Questions in Neuroscience", Tucson, AZ
 2016 Annual Society of Neurology, Plenary Speaker, Denver, CO, March
 2017 Everson Lecture, UW-Wisconsin, March
 2017 Society for Neuroscience, Special Lecture, November
 2018 Key Speaker, 38th Blankenese Conference "Translating Translation: From Basic Mechanisms to Molecular Medicine, May 2018
 2020 Joseph St. Geme Jr Lecture, University of Colorado School of Medicine

Invited seminar presentations:

- 1995 Temple University, Department of Biology, 2/95
 Bryn Mawr College, Department of Biology, 3/95
 University of Pennsylvania, Department of Genetics, 11/95
 1996 City College of New York, Department of Biology, 2/96
 Rutgers University, Department of Molecular Biology and Biochemistry, 3/96
 University of Pennsylvania, Department of Chemistry, 4/96
 University of Toronto, The Hospital for Sick Children,
 Dept of Molecular & Medical Genetics, 5/96
 University of Pennsylvania, Department of Neuroscience, 9/96
 1997 Drexel University, Department of Biosciences, 1/97
 National Eye Institute, National Institutes of Health, 2/97
 Princeton University, Department of Molecular Biology, 5/97
 University of Pennsylvania, Department of Psychology, 11/97
 1998 University of Pittsburgh, Department of Neuroscience, 2/98
 University of Iowa, Department of Biology, 10/98
 1999 University of Pennsylvania Women's Club, 10/99
 University of Texas Southwest Medical Center, Dept of Cell Biology & Neuroscience, 11/99
 2000 University of Pennsylvania, Department of Neuroscience, 2/00
 Temple University, Department of Biology, 2/00
 Skirball Institute of NYU School of Medicine, Developmental Genetics Program, 4/00
 Mass General Hospital, Cancer Center, 4/00
 University of Pennsylvania, Vet school, Department of Biochemistry, 5/00
 Baylor College of Medicine, Memory and Aging Program, 9/00
 University of Pennsylvania, Center for Neurobiology and Behavior Seminar Series, 9/00
 University of Wisconsin, Department of Genetics, 10/00
 Fox Chase Cancer Center, 11/00
 Harvard University School of Medicine, Dept of Cell Biology, 12/00
 2001 University of Washington, Seattle, WA, Department of Genetics, 2/01
 UCSF, Department of Physiology, Neuroscience Seminar Series, 2/01
 Carnegie Institute of Washington, Baltimore, MD 2/01
 University of Iowa Medical College, Department of Neurology, 2/01
 Emory University School of Medicine, Dept of Cell Biology, Atlanta, Georgia 3/01

- Stowers Institute, Kansas 11/01
- 2002 University of Virginia, Charlottesville, Department of Biology, 2/02
 NIH Neuroscience series, NINDS 3/02
 Grace Kimball Memorial Seminar Speaker, Wilkes University, 4/02
 Merck Pharmaceutical Company, Ft. Collins, PA 6/02
 California Institute of Technology, Department of Biology, Pasadena, CA 9/02
 Yale University, Department of Biochemistry and Biophysics, New Haven, Conn. 11/02
- 2003 University of Pennsylvania, Department of Chemistry, 2/03
 Johns Hopkins University, Department of Biology, Baltimore, MD, 5/03
 MRC Human Genetics Unit, Edinburgh, Scotland, 6/03
 University of Michigan, Ann Arbor, 10/03
 Burnham Institute, La Jolla, CA 12/03
- 2004 Gladstone Institute of Neurological Disease, San Francisco, CA 4/04
 Lawrence Berkeley National Laboratories, Berkeley, CA 4/04
 Franklin Institute, “The human brain—Research & Rewards” prequel webcast seminar
 for Dr. Seymour Benzer, Bower Laureate for Achievement in Science, 4/04
 Max Delbrück Center for Molecular Medicine, Berlin, Germany 6/04
 Children’s Hospital of Philadelphia, Inaugural speaker for Genes, Genomes & Pediatric
 Disease Seminar Series, 9/04
- 2005 University of Arizona, Tucson, spring 2005
 Columbia University, Department of Physiology, spring 2005
 Washington University at St. Louis, Department of Neuroscience, spring 2005
 Vollum Institute and Oregon Health Sciences University, Portland, Oregon, Dec 2005
- 2007 Stanford University, Pathology and Neurobiology Departments, Feb 2007
- 2008 University of Arizona, Tucson, Neuroscience Program, Sept 2008
 University of California, Santa Cruz, Molecular Cell & Developmental Biology, Nov 2008
 University of Minnesota, Genetics, Cell Biology & Development, Nov 2008
- 2010 Yale University, Cellular Neuroscience, Neurodegeneration & Repair, May 2010
 Heller Lecture, Interdisciplinary Center for Neural Computation, Hebrew University of
 Jerusalem, June 2010
 Roland Lecture, Interdisciplinary Center for Neural Computation, Hebrew University of
 Jerusalem, June 2010
 University of Indiana, Bloomington, Department of Biology, Nov 2010
- 2011 Columbia University School of Medicine, Motor Neuron Center Seminar, Feb 2011
 Institute of Molecular Biology, Academia Sinica, National Academy of Taiwan, Taipei, Sept
 Shanghai Jiaotong University, Shanghai, Sept 2011
 Brandeis University, Department of Biochemistry, Nov 2011
 U Mass-Worcester, Department of Neurology, Nov 2011
- 2012 Friedman Brain Institute, Mt Sinai School of Medicine, Neuroscience series, Sept 2012
 The Jackson Laboratory, Oct 2012
 MIT, Picower Brain Institute, Nov 2012
- 2013 University of Colorado, Boulder, Feb 2013
 University of California, Santa Barbara, Feb 2013
 University of Pennsylvania Medical School, Department of Genetics, Sept 2013
 Lawrence Berkeley National Laboratory, Oct 2013
 Harvard Medical School, Department of Genetics, Nov 2013
- 2014 The Scripps Research Institute, Department of Molecular & Experimental Medicine, Feb 2014
 Brown University, Department of Neuroscience, Dec 2014
- 2016 Weill Medical College, NYC, NY, April 2016
- 2017 Drexel University, January 2017
 NIH NIDDK, March 2017
 Denver Medical School, April 2017
- 2018 Cornell University, March 2018
 University of Iowa, April 2018

Northwestern, April 2018
 2019 Lecturer for the Wellcome Trust course in Molecular Neurodegeneration, January 2019
 Calico Labs, San Francisco, CA, April 2019

RESEARCH SUPPORT:

Ongoing Research Support

National Institutes of Health/NINDS, R35

12/01/16-11/31/24

Title: Molecular Insight into Neurodegenerative Disease from *Drosophila*

The goals of this project are to employ the power of the model organism *Drosophila* to provide insight into mechanisms of human neurodegenerative disease.

Role: PI

Effort: 6 months/year

Robert J Kleberg, Jr, and Helen C Kleberg Foundation Award

09/01/18-08/31/21

Title: Epigenetic dysfunction in Human Alzheimer's Disease.

Role: co-PI, with Dr. Shelley Berger

Effort: 1 month/year.

Member of Training Grants:

Neurodegeneration Training Grant (PI: Virginia Lee)

Molecular Biology Training Grant (PIs: Richard Schultz and Marisa Bartolemei)

Developmental Biology Training Grant (PIs: Jonathan Raper)

Systems Integrative Biology training grant (PI: Mike Nusbaum)

Sleep/Aging Training Grant (PI: Allan Pack)

Behavioral Biology Training Grant (PI: Ted Abel)

Genetics Training Grant (PI: Meera Sundaram)

TRAINEES:

Postdoctoral Fellows:

1995-1999 Dr. John Zimmerman (Research Specialist, Center for Sleep and Respiratory Neurobiology, University of Pennsylvania School of Medicine, Philadelphia, PA; now Lecturer, College of Liberal and Professional Studies, University of Pennsylvania)

1996-2002 Dr. John Warrick, 1996-2002 (Associate Prof, University of Richmond, Richmond, VA)

1997-2004 Dr. Beth Gordesky-Gold (Senior Research Specialist, UPenn Medical School)

1999 Dr. Maria Jose Jorquera (Ayudante de Investigación (Investigation assistant), in the Estacion Experimental de Zonas Aridas (Arid Zones Research Station) Institute of the Spanish National Council for Research, Almeria, Spain)

1999-2001 Dr. Edwin Chan, 1999-2001 (Associate Prof, The Chinese University of Hong Kong)

2001-2003 Dr. Sebastien Gaumer, 2001-2003 (Associate Professor, Université Versailles-St Quentin-en-Yvelines, France)

2001-2008 Dr. Joonil Jung (Research Scientist, Broad Institute, MIT, Cambridge, MA; then Pharma)

2002-2004 Dr. Cecilia Gold (childraising)

2003-2011 Dr. Zhenming Yu (Research Scientist, Children's Hospital of Philadelphia, Philadelphia)

2005-2008 Dr. Kangning Liu, 2005-2008 (Scientific Leader, Galaxo-Smith Kline, Shanghai, China; now Research Specialist, Children's Hospital of Philadelphia, Philadelphia, PA)

2005-2011 Dr. Ling-Yang Hao (Research Scientist, Lycera Corp., Plymouth Michigan)

2006-2014 Dr. Lorena Soares (Research Scientist, Center of Biotechnology of the Azores)

2008-2013 Dr. Hyung-Jun Kim (Research Scientist, Korea Brain Research Institute, Daegu, South Korea)

- 2008-2013 Dr. Yanshan Fang (Principal Investigator, International Research Center for Biology and Chemistry, Shanghai, China)
- 2009-2017 Dr. Alondra Burguete (NIH NRSA Postdoctoral Fellowship), Taub Center for Neuroscience, Columbia
- 2010-2018 Dr. Jason Kennerdell (Research Scientist, University of Pittsburgh College of Medicine, Aging Institute)
- 2011-2019 Dr. Amit Berson (NIH NRSA Postdoctoral Fellowship), Research Scientist for Aquinnah Pharmaceuticals, Cambridge, MA

2008-present Dr. Leeanne McGurk (National Ataxia Foundation Awardee)

Master's students:

- 2006-2007 Michael Fitzen (PhD program, Karolinska Institute, Stockholm, Sweden; now postdoctoral scientist, Oxford University)
- 2007-2008 Marijn van Jaarsveld (PhD program, Erasmus Medical Center, Rotterdam, The Netherlands)
- 2008-2010 Lindsay Yurcaba
- 2010-2011 Gert-Jan Hendriks (PhD program, Basel)

Graduate students:

- 1999-2004 Julide Bilen, Biology (Postdoctoral Scientist, Janelia Farm, Virginia with Lynn Riddiford; now Postdoctoral Scientist, Harvard University).
- 2000-2006 Lingbo Li, Biology (Postdoctoral Scientist, Stanford University, with Dr. Keng Shen)
- 2000-2003 Pavan Auluck, Neuroscience (MD/PhD program) (Resident, Dept of Pathology, Massachusetts General Hospital, Boston, MA & postdoctoral scientist with Dr. Susan Lindquist, Whitehead Institute, Boston, MA; now BioGen Idec.)
- 2000-2007 Melanie Watson, Neuroscience (Medical writer, AlphaBioCom, Radnor, PA)
- 2001-2005 Marc Meulener, Cell and Molecular Biology (MD/PhD program) (Resident, Dept of Medicine, Robert Wood Johnson Medical School, New Brunswick, NJ and Resident, Dept of Dermatology, St Luke's-Roosevelt Hospital, New York, NY)
- 2004-2010 Nan Liu, Biology (Postdoctoral scientist, UCSD with Dr. Yishi Jin; now Principal Investigator, International Research Center for Biology and Chemistry, Shanghai, China).
- 2006-2011 Shin-yi Shieh, Biology (Student Advisor)
- 2008-2013 Masashe Abe, Biology (Research scientist, Astellas Pharma, Tokyo, Japan).
- 2011-2013 Mimi Cushman, Neuroscience (co-advisor with Dr. Jim Shorter) (Postdoctoral scientist, UCSF, with Dr. William DeGrado)
- 2012-2017 Inny Lekova, Cell and Molecular Biology (Pursuing a career in medical writing)
- 2013-2018 Chia-Yu Chung, Cell and Molecular Biology (Postdoctoral Scientist, Novartis).
- 2013-present Lindsey Goodman, Neuroscience
- 2014-present Janani Saikumar, Biology (HHMI International Predoctoral Fellowship Awardee)
- 2015-present Ananth Srinivasan, Biology
- 2017-present Alexandra Perlegos, Neuroscience
- 2017-present China Bryns, Neuroscience, MSTP program

Undergraduate students:

- 1994-1997 Stacey Pusin
- 1995-1996 Sunil Mehta
- 1995-1996 Grace Kao (Vagelos Scholar)
- 1995 Kathryn Assad

1998 Eric Yecies
 2003-2005 Yuanxiang Liu (Vagelos Scholar)
 2003-2005 Rachel Bernstein (Vagelos Scholar)
 2007-2009 Liane Toohey (Vagelos Scholar)
 2008-2010 Michelle Min (Vagelos Scholar)
 2010-2013 Rosaline Zhang (Vagelos Scholar)
 2012-2013 Chang Su
 2012-2014 Van Tran (Vagelos Scholar)
 2013-2015 Jesi Kim
 2014-2015 Matthews Lan (Vagelos Scholar)
 2014-2016 Henry Zhou (Vagelos Scholar, Provost Award)
 2013-2017 Ashley Sartoris (Vagelos Scholar, masters)
 2016-2017 Decklan Cerza
 2016-2017 Sara Zhou
 2015-2018 Olivia Rifai (Vagelos Scholar, master's student)
 2017 James Aykit

2017-present Luis Martinez Ramirez
 2018-present Sofiya Patra
 2018-present Johanna Inamagua
 2018-present Jinghan Xu
 2018-present Joshua Kim (Vagelos Scholar)
 2018-present Zhecheng Jin

Visiting Scientists:

2000 Dr. Michael Atchison, Associate Professor, Head, Laboratories of Biochemistry, Dept of Animal Biology, School of Veterinary Medicine, University of Pennsylvania
 2011-2012 Dr. Robert Fairman, Professor of Biology, Haverford University
 2016-2017 Dr. Oksana Shcherbakova, Biology Faculty, Ivan Franco National University of Lviv, Ukraine (Fulbright Grantee)
 2019- Dr. Oksana Shcherbakova, Biology Faculty, Ivan Franco National University of Lviv, Ukraine
 2019- Dr. Chunnan Dong, Hebei Medical University, Beijing, China (anticipated)

EDUCATIONAL MISSION TO THE UNIVERSITY:

1994-1997 (fall) Biology 101: Introductory Biology, Course Co-Director (~200 students)
 1996-2000 (sp) Biology 540: Genetic systems (~30 students), Course Developer & Director
 2000 Co-Developer Biology special concentration "neurobiology"
 1994-present Biol399/499 Undergraduate Independent Study (5-10 students sponsored/semester)
 1994-present Biology Undergraduate Advisor
 1999-present (fall) Biology 221: Molecular Biology and Genetics (~100 students), Course Co-Director, 1999-2015 spring, 2015 fall – present.
 2004-present (fall) Biology 527: Advanced Molecular Biology and Genetics (~5 students), Bio 221 lectures, plus additional reading & writing assignments
 2014-present (fall) Biology 466: Molecular Genetics of Neurological Disease (~15 students), Course Developer & Director
 2014-present Developer & Director of Biology special concentration "Mechanisms of Disease"

Lectures in various courses, including the following:

Biol 122: Living systems (~150 students)

Biol 254: Developmental Biology (~30 students)
 Biol 421: Molecular Genetics (~ 30 students)
 Biol 488/Neurosci 578: Advanced Topics in Behavioral Genetics (~20 students)
 Biol 526: Principles of Genetics (~30 students)
 Biol 540: Genetic Systems (~35 students)
 Biol 999 Independent Study: (1 student at a time, with selected topics and papers)
 CAMB 511: Principles of Development (~30 students)
 CAMB 542: Topics in Molecular Medicine (~30 students)
 CAMB 615: Protein Conformation Diseases (~15 students)
 Cell 620: Developmental Biology (~15 students)
 Coll 100: "How do you know?" (~50 students)
 HSOC 241/STSC 241- Stem cells, science and society (~ 30 students)
 Molecular Biology 605: Post-transcriptional Regulation in Development (~30 students)
 Neuroscience 597: Developmental Neurobiology (~30 students)
 Neuroscience Core I, INSC 571: Cell and Molecular Neuroscience (~30 students)
 Neuroscience INSC 600-601: Neurobiology of Disease (~ 10 students)
 Neuroscience Seminar Course (~15 students)
 INSC Basic Skills/Journal Club Course (~30 students)

SERVICE TO THE DEPARTMENT:

Awards committee, Chair, Department of Biology, 2018-
 Executive Committee, Department of Biology, 2018-
 Promotion Committee, Chair, Dr. Nick Bentley, Department of Biology, 2018-
 Mentoring Committee, Dr. Nick Bentley, Department of Biology, 2016-
 Sponsor for Adjunct Professorships, since 2000
 Departmental Undergraduate Advisor & Neuroscience & Mechanisms of Disease concentration, 2000-
 Biology Graduate Group, since 1994
 Member of many preliminary exam and thesis committees, since 1994

Promotion Committee, Dr. Marc Schmidt, Department of Biology, 2017-2018
 Mentoring Committee, Dr. Tim Linksvayer, Department of Biology, 2012-2017
 Mentoring Committee for the Graduate Student 2014 class, 2014-2016
 Mentoring Committee, Dr. Brian Gregory, Department of Biology, 2010-2016
 Member of the Search Committee in Neurobiology, 2014-2015
 Development and Launch of of Mechanisms of Disease concentration, 2014-2015
 Promotions committee guidelines, Biology, 2014
 Promotion committee, Dr. Brian Gregory, Department of Biology, 2012
 Promotion to tenure committee, Dr. Deijen Ren, Department of Biology, 2009
 Biology Undergraduate Honors Committee, Dept Biology, 2009
 Committee to select new Biology Department Chair, spring 2008
 Biology graduate group, Biology 700 Revision Committee, 2008
 Search Committee, Neurological basis of behavior, Department of Biology, 2006-2008
 Promotion to full professor committee for Dr. Ted Abel, Department of Biology, 2006-2007
 Chair, Promotion tenure committee for Dr. Marc Schmidt, Department of Biology, 2005-2006
 Promotion tenure committee for Dr. Doris Wagner, Department of Biology, 2005-2007
 Graduate Admissions Committee, Chair, Graduate Group in Biology, 1999-2006
 Biology newsletter Advisory Committee, 2001-2004
 Promotion tenure committee for Dr. Ted Abel, Department of Biology, 2003-2004.
 Undergraduate Advising Committee, 2000-2003
 Established undergraduate Concentration in Neuroscience, 2000
 Cell Biology and Genomics Search, 1999-2000
 Penn Advisory Board Presentation, 10/99
 Neurobiology Search, 1998-1999

Biology Department Seminar Committee, chairman, 1997-1999.
 Board of Overseers presentation, 11/96
 Penn Alumni Club of New York speaker for "Biotech Horizons", 9/96
 Neurobiology Search, 1995-1996
 Biology Undergraduate Student Night speaker, 2/96
 Advisor, Graduate Group in Biology, 1994-1996
 Admissions, Graduate Group in Biology, 1994-1996
 Physiology Search, 1995-1996

SERVICE TO THE UNIVERSITY:

Catastrophe Committee, School of Arts and Sciences, 2018-
 Member, MindCore Vision Committee, School of Arts and Sciences 2016-
 Institute of Regenerative Medicine, Neuroscience member, 2012-
 Institute on Aging, Advisory Committee, U Penn Medical School, 2003-
 Ad-hoc member of various Promotion-to-Tenure Committees, U Penn Medical School, 2001-
 Member of many preliminary exam and thesis committees for students in various departments of the
 Medical School, 1994-

Personnel Committee, Natural Sciences Subpanel, 2014-2017
 Tenure Task Force Committee, School of Arts and Sciences, for Dean of Arts and Sciences, 2015-
 2016
 Selection Committee for HHMI international predoctoral students, for Vice Provost for Research, 2015
 Scientific Reviewer for the Center for the Penn Medicine Neuroscience Center, 2014, 2015
 Selection committee for Blavatnick Awards, for the VPR, Nov 2014
 Center for Technology Transfer, Scientific Oversight Committee, 2012-2014
 Provost Consultation Committee for selection of new Vice Provost for Research, 2013
 Member of Search Committee, BGS (Biological Graduate Studies graduate group) director and
 Associate Dean of Graduate Education search, Penn Medical School, spring 2013
 Institute of Regenerative Medicine, Review Committee, 2012-2013
 Penn Medicine Neuroscience Center Pilot Grant Review Committee, 2012
 Search Committee, Biomedical Graduate Studies (BGS) Director and Associate Dean of Graduate
 Education, School of Medicine, 2013
 Faculty Senate Nominating Committee, School of Arts and Sciences, 2012-2013
 Professors of Integrative Medicine Advisory Committee, 2009-2012
 Planning and Priorities Committee, School of Arts and Sciences, 2009-2012
 Mentoring Committee, Dr. Aaron Gitler, Cell and Developmental Biology, 2007-2011
 Mentoring Committee, Dr. Sara Cherry, Dept of Microbiology, 2006-2012
 Penn Genomic Frontiers Institute, Scientific Advisory Committee, 2007-2011
 Department of Neuroscience Search Committee, 2008-2009
 PGFI-SOM search committee, Chair, 2008-2009
 Tenure advising Committee, Dr. Laurie Flanagan-Cato, Dept of Psychology, 2008
 CAMB Review Committee, 2008
 Internal Scientific Advisory Group for Aging Program Project Grant, PI: Allan Pack, 2006
 School of Arts and Sciences, Committee on Undergraduate Education, 2004-2006
 Search Committee for Chair of Genetics, U Penn Medical School, 2004-2006
 Penn Genomics Institute, Seed Grant Review Committee, 2004-2006
 Penn Reading Project, 2004, 2005, 2006
 Cell Center Advisory Committee, 2000-2008
 Stellar Task Force, Department of Neuroscience, U Penn Medical School, 2004-2006
 Seminar Committee, Department of Neuroscience, 2004
 Speaker for Student Committee on Undergraduate Education, January 2004
 Search Committee, Vice Provost for Research, 2003
 Search Committee, Dept of Pharmacology and Institute on Aging, 2003

University Council Committee on Research, 2001-2002
 INSC Advisory Committee, 2001-2003
 INSC Preliminary Examination Topic Committee, 2001-2002
 Aging subgroup, University of Penn Medical School strategic planning, 2002
 Pharmacology Graduate Group Review Committee, Academic year 2001-2002
 Chemistry Search Committee, Academic year 2001-2002
 MD/PhD Admissions Committee for Neuroscience, 2000-2002
 Speaker for Academic Job Market: Penn Career Services, 9/25/01
 Conflict of Interest Standing Committee, 2001-2002
 Search Committee, Department of Animal Biology, Vet School, 2000-2001
 Penn on the Road Presentation, Boston, MA, 11/9/99
 University of Pennsylvania representative for the Science Coalition "Science: Invest
 in the Future" event, Washington, DC, 9/22/99
 Speaker for University of Pennsylvania Women's Club, 10/26/99
 Thesis Template Committee, Department of Neuroscience, 2000
 Academic Review Committee, Department of Neuroscience, 1999-2003
 Retreat Committee, Department of Neuroscience, academic year 1999-2001
 Steering Committee, Program in Developmental Biology, CAMB, 1999-2000
 Speaker for Career Services "Faculty conversations on the Academic Job Search and
 Academic Life: Preparing for Campus Interviews for Academic Jobs," Jan 19, 1999
 Speaker for Career Services "Academic Career Conference: Going on the Job Market", Sept. 22,
 1998
 Committee on Undergraduate Research Proposals, 1998
 Speaker for "Biotech Horizons", New York Penn Club, 9/97
 Graduate Student Rotation Talk Committee, Department of Neuroscience, 1997-2002
 Freshman Advisor, 1997-2002
 Seminar Selection Committee, Department of Neuroscience, 1997-1998
 Graduate Group Representative to Selection Committee for Department of Neuroscience,
 Cell & Molecular Biology Training Grant, 1997
 Cell and Developmental Biology Retreat committee, 1996

Graduate Group Memberships:

1994-present Biology Graduate Group
 1996-2003 Cell and Molecular Biology Graduate Group
 1996-2005 Vision Center member and Faculty Trainer of Vision Training Grant,
 1996-present Neuroscience Graduate Group, University of Pennsylvania
 2012-present Cell and Molecular Biology Graduate Group

Contributions to Science:

Dr. Bonini's contributions include the demonstration, by example, that *Drosophila* can be used as a remarkable model for human disease. The laboratory's research has shown how such a model can be used to reveal unique insights into perturbed pathways, increasing biological understanding and developing a foundation for therapeutics. The laboratory has discovered unexpected and novel pathways involved in both disease and normal biology, and has also pioneered the application of *Drosophila* toward understanding of additional important problems in human biology and injury. The initial study that illustrated that the fly can be used as a model of disease was in collaboration with human geneticists, where they expressed in *Drosophila* the normal and mutant forms of a human neurodegenerative polyQ disease protein. These studies showed that the normal protein had no effect when expressed in the fly, whereas expression of the mutant disease form conferred an effect that recapitulated the essential features of the human disorder within an exceptionally rapid time frame, compared to other *in vivo* models. This provided an exceptional genetic model for a human neurodegenerative disease.

Those studies served to open the field to many investigators for similar studies with other human degenerative diseases, additional human diseases and fundamental biological problems. These applications were not only in *Drosophila*, but also in other organisms with powerful genetic approaches, including yeast and *C. elegans*. The power of this approach was shown by the Bonini laboratory in manipulating the genetics of the organism to reveal insight into the disease process. An initial pathway identified was molecular chaperones, where upregulation of chaperone activity powerfully mitigated polyQ disease effects in the fly. This work was then applied to other diseases like Parkinson's disease models, where molecular chaperones were shown to mitigate disease effects through a similar approach. This work established chaperones as strong therapeutic targets in multiple neurodegenerative situations. In the latter, disruptions in the same pathways were shown to occur in human disease tissue. Thus, the Bonini laboratory showed by example how genetic modifier pathways identified and characterized in *Drosophila* can define pathways of great relevance to human disease intervention. In the course of the studies, the laboratory has revealed novel roles for microRNAs in the brain with ageing and disease susceptibility, novel modulators of triplet repeat expansion, that the RNA encoding the polyQ disease protein has toxicity beyond the encoded disease protein, among others. The laboratory's success with using *Drosophila* as an *in vivo* model for human neurodegenerative disease encouraged investigation of additional processes of importance to human brain disease and health, and additional impacts on disease, including environmental insults and the gut microbiota. The Bonini laboratory has also generated and publish protocols and examples for others, encouraging this important field and approach.

1. The laboratory's publication that introduced by example the approach that *Drosophila* could be a remarkable model for human disease is Warrick *et al.* (1998). Since that time, the laboratory has also introduced models for other neurodegenerative diseases.

- a. Warrick JM, Paulson H, Gray-Board GL, Bui QT, Fischbeck K, Pittman RN, and **Bonini NM** (1998) Expanded polyglutamine protein forms nuclear inclusions and causes neural degeneration in *Drosophila*. *Cell* 93: 939-949.

2. Publications that proved the power of the modeling approach and applying that power back to the human condition are illustrated by the below publications.

- a. Warrick J, Chan HYE, Gray-Board GL, Paulson H and **Bonini NM** (1999) Suppression of polyglutamine disease in *Drosophila* by the molecular chaperone hsp70. *Nature Genetics*, 23: 425-428.
- b. Auluck PK, Chan HYE, Trojanowski JQ, Lee VML and Bonini NM (2002) Chaperone Suppression of α -Synuclein Toxicity in a *Drosophila* Model for Parkinson's Disease. Online 1067389. *Science* 295:865-868.

- c. Elden AC[^], Kim H-J[^], Hart M[^], Chen-Plotkin AS[^], Johnson BS, Fang X, Armakola M, Geser F, Greene R, Lu MM, Padmanabhan A, Clay D, McCluskey L, Elman L, Juhr D, Gruber PJ, Rub U, Auburger G, Trojanowski JQ, Lee VM-Y, Van Deerlin VM, Bonini NM* and Gitler AD* (2010) Ataxin-2 intermediate length polyglutamine expansions are associated with increased risk for ALS. *Nature* 466: 1069-75. PMC 2965417. [^] co-first authors, *co-senior authors.
 - d. Kim HJ, Raphael AR, LaDow ES, McGurk L, Weber RA, Trojanowski JQ, Lee VM, Finnkbeiner S, Gitler AD, **Bonini NM** (2014) Therapeutic modulation of eIF2 α phosphorylation rescues TDP-43 toxicity in amyotrophic lateral sclerosis disease models. *Nat Genet* 46:152-160. Epub 2013 Dec 15. PMC3934366.
 - e. Berson A, Sartoris A, Nativio R, Van Deerlin V, Toledo JB, Porta S, Liu S, Chung CY, Garcia BA, Lee VM, Trojanowski JQ, Johnson FB, Berger SL, **Bonini NM** (2017) TDP-43 promotes neurodegeneration by impairing chromatin remodeling. *Curr Biol* 27: 3579-3590. PMC5720388.
3. Publications that detail unexpected genetic pathways that modulate disease effects in *Drosophila*, including elucidation of key players in brain ageing, for novel insight:
- a. Jung J and **Bonini NM** (2007) CREB-binding Protein Modulates Repeat Instability in a *Drosophila* Model for PolyQ Disease. *Science* 315: 1857-1859. Published online 1 March 2007 10.1126/science.1139517. PMC2778376.
 - b. Li LB, Yu Z, Teng X and **Bonini NM** (2008) RNA toxicity is a component of ataxin-3 degeneration in *Drosophila*. *Nature*, 453:1107-11. Epub 2008 Apr 30. PMC2574630.
 - c. Liu N, Landreh M, Cao K, Abe M, Hendriks GJ, Kennerdell JR, Zhu Y, Wang LS, **Bonini NM** (2012) The microRNA miR-34 modulates ageing and neurodegeneration in *Drosophila*. *Nature* 482: 519-23. Doi 10.1038/nature 10810. PMC3326599.
 - d. Burguete AS, Almeida S, Gao FB, Kalb R, Akins MR, **Bonini NM** (2015) GGGGCC microsatellite RNA is neurotically localized, induces branching defects, and perturbs transport granule function. *Elife* 4:e08881. PMC4758954.
4. Publications that detail investigation of additional processes of critical importance to human biology and health, and additional features of disease (such as environmental impacts) on the degenerative process, and protocols to encourage the field:
- a. Meulener M, Xu K, Thomson L, Ischiropoulos H and **Bonini NM** (2006) Mutational analysis of DJ-1 in *Drosophila* implicates functional inactivation by oxidative damage and aging. *Proc. Natl. Acad. Sci USA* 103: 12517-22. Epub 2006 Aug 7.
 - b. Fang Y, Soares L, Teng X, Geary M and **Bonini NM** (2012) A novel *Drosophila* model of nerve injury reveals an essential role of endogenous Nmnat in maintaining axon integrity. *Curr Biol* 22: 590-595. PMC3347919.
 - c. Soares L, Parisi M and **Bonini NM** (2014) Axon injury and regeneration in the adult *Drosophila*. *Sci Rep.* 4: 6199. Doi: 10.1038/srep06199. PMC4145289.
 - d. Fang Y, Soares L and **Bonini NM** (2013) Design and implementation of in vivo imaging of neural injury responses in the adult *Drosophila* wing. *Nat Protocol* 8: 810-19. Epub 2013 Mar 28. PMC4032490.
 - e. Nativio R, Donahue G, Berson A, Lan Y, Amlie-Wolf A, Tuzer F, Toledo JB, Gosai SJ, Gregory BD, Torres C, Trojanowski JQ, Wang LS, Johnson FB, **Bonini NM**, Berger SL. (2018) Dysregulation of the epigenetic landscape of normal aging in Alzheimer's disease. *Nat Neurosci* doi: 10.1038/a41593-018-0101-9. PMID 29507413 (PMC in progress).

Complete list of publications:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/1VgfyYHftHKk7/bibliographhy/44355946/public/?sort=date&direction=descending>

LISTING of ALL PUBLICATIONS (*non-peer-reviewed):**As an undergraduate:**

1. Tempel BL, Bonini NM, Dawson DR, and Quinn WG (1983) Reward learning in normal and mutant *Drosophila*. Proc. Natl. Acad. Sci. USA 80:1482-1486.

As a graduate student:

2. Bonini NM, Gustin MC and Nelson DL (1986) Regulation of ciliary motility by membrane potential in *Paramecium*: A role for cyclic AMP. Cell Motil. Cytoskeleton 6:256-272.
3. Bonini NM and Nelson DL (1988) Differential regulation of *Paramecium* ciliary motility by cAMP and cGMP. J. Cell Biol. 106:1615-1623.
4. Bonini NM and Nelson DL (1990) Phosphoproteins associated with cyclic nucleotide stimulation of ciliary motility in *Paramecium*. J Cell Science 95:219-230.
5. *Bonini NM, Evans TC, Miglietta LAP, and Nelson DL (1991) The regulation of ciliary motility in *Paramecium* by Ca²⁺ and cyclic nucleotides. Advances in Second Messenger and Phosphoprotein Research. Vol. 23: 227-272.
6. Bonini NM, Leiserson WM, and Benzer S (1993) The *eyes absent* gene: genetic control of cell survival and differentiation in the developing *Drosophila* eye. Cell 72:379-395.
7. Leiserson WM, Bonini NM and Benzer S (1994) Transvection at the *eyes absent* gene of *Drosophila*. Genetics 138:1171-1179.

As a Principal Investigator:

8. *Bonini NM and Choi K-W (1995) Early decisions in *Drosophila* eye morphogenesis. Current Opinion in Genetics and Development 5: 507-515.
9. *Bonini NM (1997) Surviving *Drosophila* eye development. Cell Death & Differentiation 4:4-11.
10. Zimmerman J, Bui Q, Steingrimmson E, Nagle DL, Fu W, Genin A, Spinner N, Copeland NG, Jenkins NA, Bucan M, and Bonini NM. (1997) Cloning and characterization of two vertebrate homologs of the *Drosophila eyes absent* gene. Genome Research 7:128-141.
11. Boyle M, Bonini N and DiNardo S. (1997) Expression and function of *cliff* in the development of somatic gonadal precursors within the *Drosophila* mesoderm. Development 124:971-982.
12. Bonini NM, Bui QT, Gray-Board GL and Warrick JM (1997) The *Drosophila eyes absent* gene directs ectopic eye formation in a pathway conserved between flies and vertebrates. Development 124: 4819-4826.
13. Bonini NM, Leiserson WM and Benzer S. (1998) Expression and multiple roles of the *eyes absent* gene in *Drosophila*. Developmental Biology, 129: 42-57.
14. Leiserson WM, Benzer S and Bonini NM. (1998) Dual functions of the *Drosophila eyes absent* gene in the eye and embryo. Mechanisms of Development 73:193-202.
15. Warrick JM, Paulson H, Gray-Board GL, Bui QT, Fischbeck K, Pittman RN, and Bonini NM. (1998) Expanded polyglutamine protein forms nuclear inclusions and causes neural degeneration in *Drosophila*. Cell 93: 939-949.
16. Perez MK, Paulson HL, Pendse SJ, Saionz SJ, Bonini NM and Pittman RN (1998) Recruitment and the role of nuclear localization in polyglutamine-mediated aggregation. J Cell Biol 143: 1457-1470.
17. *Bonini NM (1999) A genetic model for human polyglutamine-repeat disease in *Drosophila melanogaster*. Phil. Trans. R. Soc. Lond. B 354: 1057-1060.
18. Bonini NM and Fortini, ME (1999) Survival during *Drosophila* eye development: Integrating cell death with cell differentiation during formation of a neural structure. BioEssays 21: 991-1003.

19. Zimmerman J, Bui Q, Liu H, and Bonini NM (1999) Molecular genetic analysis of *Drosophila* eye *absent* mutants reveals features critical for eye cell expression. *Genetics*, 154: 237-246.
20. Chai Y, Koppenhafer SL, Bonini NM and Paulson HL (1999) Analysis of the role of heat shock protein (Hsp) molecular chaperones in polyglutamine disease. *J Neuroscience*, 19: 10338-10347.
21. Warrick J, Chan HYE, Gray-Board GL, Paulson H and Bonini NM (1999) Suppression of polyglutamine disease in *Drosophila* by the molecular chaperone hsp70. *Nature Genetics*, 23: 425-428.
22. Fortini ME and Bonini NM (2000) Modeling human neurodegenerative diseases in *Drosophila*: on a wing and a prayer. *Trends in Genetics* 16: 161-167.
23. *Bonini NM (2000) *Drosophila* as a genetic tool to define vertebrate pathway players. *Methods Mol Biol.* 136:7-14.
24. *Bonini NM (2000) Methods to detect patterns of cell death in *Drosophila*. *Methods Mol Biol.* 136:115-21.
25. Bui QT, Zimmerman JE, Liu H, Gray-Board GL and Bonini NM. (2000) Functional analysis of an eye enhancer of the *Drosophila* eyes *absent* gene: Differential regulation by eye specification genes. *Dev Biol* 221: 355-364.
26. Bui QT, Zimmerman JE, Liu H and Bonini NM. (2000) *Drosophila* eyes *absent* mutants reveal functional subdomains within the conserved Eya domain. *Genetics* 155: 709-720.
27. *Paulson H and Bonini NM. (2000) Spinocerebellar ataxia type 3. *Neuroscience News* 3:87-93.
28. Chan HYE and Bonini NM. (2000) Neuropathological Cell death in *Drosophila*. *Cell Death Differ.* 7: 1075-1080.
29. Chan HYE, Warrick JM, Gray-Board GL, Paulson HL and Bonini NM (2000) Mechanisms of chaperone suppression of polyglutamine disease: selectivity, synergy, and modulation of protein solubility in *Drosophila*. *Hum Mol Genetics* 9:2811-2820.
30. *Paulson HL, Bonini NM and Roth KA (2000) Polyglutamine disease and neuronal cell death. *Proc. Natl. Acad. Sci. USA* 97: 12957-12958.
31. *Bonini NM. (2001) *Drosophila* as a genetic approach to human neurodegenerative disease. *Parkinsonism Relat. Disord.* 7:171-175
32. *Bonini NM (2001) A genetic model for human polyglutamine-repeat disease in *Drosophila melanogaster*. In *Glutamine repeats and neurodegenerative diseases: molecular aspects*, edited by Prof. P.S. Harper and Dr. M. Perutz, Oxford University Press.
33. *Bonini, NM (2001) Stores to die for. *Developmental Cell* 1:447-448.
34. *Bonini NM and Fortini ME (2002) "Applications: Models for Human Disease" pp. 257-275 in *Drosophila Eye Development*, K Moses editor, Springer-Verlag, Berlin.
35. *Chan HYE and Bonini NM (2002) *Drosophila* models of polyglutamine diseases, pp. 241-251 in *Methods in Molecular Biology, vol 217: Neurogenetics: Methods and Protocols*, Potter NT, editor.
36. Auluck PK, Chan HYE, Trojanowski JQ, Lee VML and Bonini NM (2002) Chaperone Suppression of α -Synuclein Toxicity in a *Drosophila* Model for Parkinson's Disease. Online 1067389. *Science* 295:865-868.
[Publication highlighted in *Science Perspectives in the same issue, Science* 295: 809-10].
37. Bonini NM (2002) Chaperoning brain degeneration. *Proc. Natl. Acad. Sci. USA* 99: 16407-16411

38. Chan HYE, Warrick JM, Andriola I, Merry D, and Bonini NM (2002) Genetic modulation of polyglutamine toxicity by protein conjugation pathways in *Drosophila*. *Human Molecular Genetics* 11: 2895-2904.
39. Auluck PK and Bonini NM (2002) Pharmacologic Prevention of Parkinson's disease in *Drosophila*. *Nature Medicine* 8:1185-1186.
40. Atchison L, Ghias A, Wilkinson F, Bonini N and Atchison ML (2003) Transcription factor YY1 functions as a PcG Protein in vivo. *EMBO J.* 22:1347-58.
41. *Bonini NM and Fortini ME (2003) Human neurodegenerative disease modeling using *Drosophila*. *Ann. Rev. Neurosci.* 26:627-56. Epub 2003 Apr 10.
42. Gunawardena S, Her LS, Bruschi RG, Laymon RA, Niesman IR, Gordesky-Gold B, Sintasath L, Bonini NM, Goldstein LS (2003) Disruption of axonal transport by loss of huntingtin or expression of pathogenic polyQ proteins in *Drosophila*. *Neuron* 40: 25-40.
[Publication highlighted in news and views articles: Love, R (2003) *The Lancet Neurology*, Vol 2: 651; Feany and LaSpada (2003) *Neuron* 40: 1-2]
43. Auluck PK, Meulener MC and Bonini NM (2005) Mechanisms of suppression of alpha-synuclein neurotoxicity by geldanamycin in *Drosophila*. *J Biol Chem.* 280: 2873-8. Epub 2004 Nov 18.
44. Warrick JM, Gordesky-Gold B, Morabito L, Faust L, Paulson HL, and Bonini NM. (2005) Ataxin-3 suppresses polyglutamine neurodegeneration in *Drosophila* by a ubiquitin-associated mechanism. *Molecular Cell* 18: 37-48.
45. Meulener MC, Graves CL, Sampathu DM, Armstrong-Gold CE, Bonini NM and Giasson BL. (2005) DJ-1 is present in a large molecular complex in human brain tissue and interacts with alpha-synuclein. *J. Neurochemistry* 93: 1524-32.
46. Bilen J and Bonini NM (2005) *Drosophila* models of human age associated neuro-degenerative diseases. *Ann. Rev. Genetics* 39: 153-171.
47. *Bonini NM and Giasson BI (2005) Snaring the function of alpha-synuclein. *Cell* 123: 359-361.
48. Meulener M, Whitworth AJ, Armstrong-Gold CE, Rizzu P, Heutink P, Wes PD, Pallanck LJ, Bonini NM (2005) *Drosophila* DJ-1 mutants are selectively sensitive to environmental toxins with Parkinson's disease. *Curr Biol* 15: 157207.
[Publication highlighted in *Nature Reviews Genetics*, among other journals]
49. Bonini NM and LaSpada AR (2005) Silencing polyglutamine degeneration with RNAi. *Neuron* 48: 715-8.
50. Giasson BI, Covy JP, Bonini NM, Hurtig HI, Farrer MJ, Trojanowski JQ, Van Deerlin VM (2006) Biochemical and pathological characterization of Lrrk2. *Ann. Neurol.* 59: 315-322.
51. Uryu K, Richter-Landsberg C, Welch W, Sun E, Goldbaum O, Norris EH, Pham CT, Yazawa I, Hillburger K, Micsenyi M, Giasson BI, Bonini NM, Lee VM, Trojanowski JQ (2006) Convergence of heat shock protein 90 with ubiquitin in filamentous alpha-synuclein inclusions of alpha-synucleinopathies. *Am J Pathol.* 168: 947-961.
52. Boeddrich A, Gaumer S, Haacke A, Tzvetkov N, Albrecht M, Evert BO, Müller EC, Lurz R, Breuer P, Schugardt N, Plaßmann S, Xu K, Warrick JM, Suopanki J, Wüllner U, Frank R, Hartl FU, Bonini NM, Wanker EE. (2006) An arginine/lysine-rich motif in ataxin-3 is responsible for the interaction with the molecular chaperone VCP that modulates aggregate formation and neurotoxicity. *EMBO J* 25:1547-1558.
53. Cooper AA, Gitler AD, Cashikar A, Haynes CM, Hill KJ, Bhullar B, Liu K, Xu K, Strathearn KE, Liu F, Cao S, Caldwell GA, Marsischky G, Kolodner RD, Labaer J, Rochet JC, Bonini NM, Lindquist S (2006) Alpha-synuclein blocks ER-Golgi traffic and rab1 rescues neuron loss in Parkinson's models. *Science* 313: 324-8. Epub 2006 Jun 22.

54. Meulener M, Xu K, Thomson L, Ischiropoulos H and Bonini NM (2006) Mutational analysis of DJ-1 in *Drosophila* implicates functional inactivation by oxidative damage and aging. *Proc Natl. Acad. Sci USA* 103: 12517-22. Epub 2006 Aug 7.
55. Bilen J, Liu N, Burnett BG, Pittman RN, and Bonini NM (2006) MicroRNA pathways modulate polyglutamine-induced neurodegeneration. *Molecular Cell* 24: 157-63.
56. Bilen J, Liu N and Bonini NM (2006) A new role for microRNA pathways: modulation of degeneration induced by pathogenic human disease proteins. *Cell Cycle* 5: 2835-8.
57. *Liu N and Bonini NM (2006) Hosting neurotoxicity in polyglutamine disease. *Cell* 127: 1299-300.
58. *Bilen J and Bonini NM (2006) Invertebrate models of age-associated neurodegenerative diseases, in Uversky VN and Fink AL, eds, *Protein misfolding, aggregation and conformational diseases*, Kluwer Academic/Plenum publishers.
59. Jung J and Bonini NM (2007) CREB-binding Protein Modulates Repeat Instability in a *Drosophila* Model for PolyQ Disease. *Science* 315: 1857-1859. Published online 1 March 2007 10.1126/science.1139517.
[Publication highlighted in *Science News & Views*, *Nature Structural & Molecular Biology*, among others]
60. Bilen J and Bonini NM (2007) Genome-wide screen for modifiers of ataxin-3 neurodegeneration in *Drosophila*. *PLoS Genet.* 3:1950-64.
61. Li LB, Xu K and Bonini NM (2007) Suppression of polyglutamine toxicity by the yeast sup35 prion domain in *Drosophila*. *J Biol Chem* 282: 37694-701.
62. Lessing D and Bonini NM (2008) Polyglutamine genes interact to modulate the severity and progression of neurodegeneration in *Drosophila*. *PLoS Biol.* 6: e29.
[Publication highlighted in *PLoS series*]
63. Li LB, Yu Z, Teng X and Bonini NM (2008) RNA toxicity is a component of ataxin-3 degeneration in *Drosophila*. *Nature*, 453:1107-11. Epub 2008 Apr 30.
[Publication highlighted in *Current Biology*]
64. Watson MR, Lagow RD, Xu K, Zhang B and Bonini NM (2008) A *Drosophila* model for amyotrophic lateral sclerosis reveals motor neuron damage by human SOD1. *J Biol Chem* 283: 24972-81. Epub 2008 Jul 2.
[Selected Paper of the Week, with Author profile of Melanie Watson]
65. *Bonini NM (2008) A tribute to Seymour Benzer, 1921-2007. *Genetics* 180: 1265-73.
66. *Bonini NM (2008) *Drosophila* models for Parkinson's disease Research. In Nass R and Przedborski S "Parkinson's disease: Pathogenic and therapeutic insights from toxin and genetic models". Elsevier Press, San Diego, CA.
67. Lessing D and Bonini NM (2009) Maintaining the brain: Insight into human neurodegeneration from *Drosophila* mutants. *Nature Rev Genet* 10: 359-370. Epub 2009 May 12.
68. Jung J, Xu G, Lessing D and Bonini NM (2009) Preventing ataxin-3 protein cleavage mitigates degeneration in a *Drosophila* model of SCA3. *Hum Mol Genet* 18: 4843-4852. Epub 2009 Sept 25. PMID: 19783548.
69. Li LB and Bonini NM (2010) Roles of trinucleotide-repeat RNA in neurological disease and degeneration. *Trends Neurosci* 33: 292-8. PMID 20398949.
70. Hao L-Y, Giasson B and Bonini NM (2010) DJ-1 is critical for mitochondrial function and rescues PINK1 loss of function. *Proc Natl Acad Sci USA* 107: 9747-52. Epub 2010 May 10. PMID: 20457924.

71. Elden AC[^], Kim H-J[^], Hart M[^], Chen-Plotkin AS[^], Johnson BS, Fang X, Armakola M, Geser F, Greene R, Lu MM, Padmanabhan A, Clay D, McCluskey L, Elman L, Juhr D, Gruber PJ, Rub U, Auburger G, Trojanowski JQ, Lee VM-Y, Van Deerlin VM, Bonini NM* and Gitler AD* (2010) Ataxin-2 intermediate length polyglutamine expansions are associated with increased risk for ALS. *Nature* 466: 1069-75. PMID: 20740007.
[Publication highlighted in *Nature News & Views*, *Nature Reviews Neurology*, among others]
[^]co-first authors *co-corresponding authors
72. Jung J, van Jaarsveld M, Shieh S-Y, Xu K and Bonini NM (2011) Defining genetic factors that modulate intergenerational repeat instability in *Drosophila melanogaster*. *Genetics* 187: 61-71. Epub 2010 Nov 1.
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