

Curriculum Vitae

Paul A. Kirchman

Education, Research, and Work Experience

Associate Professor of Biology and Chair of Sciences and Mathematics,
Harriet L. Wilkes Honors College, Florida Atlantic University
July 2006 – Present

Associate Professor of Biology and Interim Chair of Sciences and Mathematics,
Harriet L. Wilkes Honors College, Florida Atlantic University
May 2005 – June 2006

Associate Professor of Biology, Interim Chair of Social Sciences and Mathematics,
Harriet L. Wilkes Honors College, Florida Atlantic University
December 2004 – April 2005

Associate Professor of Biology, Harriet L. Wilkes Honors College
Florida Atlantic University
August 2004 – December 2004

Assistant Professor of Biology, Honors College
Florida Atlantic University
August 1999 – July 2004

Post-doctoral Fellow, Department of Biochemistry and Molecular Biology
Louisiana State University Medical Center
May 1994 – June 1999

Post-doctoral Research, Center of Marine Biotechnology
University of Maryland, College Park, MD
October 1992 - March 1994

Doctor of Philosophy, Department of Microbiology and Immunology
Emory University, Atlanta, Georgia
July 1987 - October 1992

Bachelor of Science, Biology (Honors)
Eckerd College, St. Petersburg, Florida
August 1983 - May 1987

Grants Awarded

PI on NSF Scholarships in Science, Technology, Engineering, and Math (S-STEM) Award
“Wilkes Honors College Science Scholarships” (NSF-0631058) - \$500,000, Start Date
October 2006. Completed September 2012.

PI on NIH Academic Research Enhancement Award (AREA, R-15) "Mitochondrial Function and Aging in *S. cerevisiae*" (1 R15 AG021956-01) - \$202,565, Start Date May 2003. Completed May 2007.

Co-PI on NSF CCLI-Adaptation and Implementation Grant, "Discovery-Based Science and Mathematics in an Environmental Context" (NSF-0088211) - \$187,054, Start Date May 15, 2001.

Research Initiation Award, Florida Atlantic University, "Analysis of the Relationship Between Mitochondrial Genotype and Longevity in *Saccharomyces cerevisiae*" (RIA-21) - \$4,711, March, 2000.

National Research Service Award, Individual Postdoctoral Fellowship, National Institutes of Health, "Role of a *LAG1* Homologue in Yeast Replicative Life Span." (AG05710), September, 1995.

Grant review

NSF S-STEM Panel Meeting September 22-23, 2011

Publications

Botta, G., Turn, C.S., Quintyne, N.J., **Kirchman, P.A.** (2011) Increased iron supplied through Fet3p results in life span extension of *Saccharomyces cerevisiae* under conditions requiring respiratory metabolism. *Exp. Gerontol.* **46**: 827-832.

Kirchman, P.A., and Botta, G. (2007) Copper supplementation increases yeast life span under conditions requiring respiratory metabolism. *Mech. Ageing Dev.* **128**: 187-195.

Jiang, J.C., **Kirchman, P.A.**, Allan, M., and Jazwinski, S.M. (2004) Suppressor analysis points to the subtle role of the *LAG1* ceramide synthase gene in determining yeast longevity. *Exp. Gerontol.* **39**: 999-1009.

Kirchman, P.A., Miceli, M.V., West, R.D., Jiang, J.C., Kim S., and Jazwinski, S.M. (2003) Prohibitins and Ras2 protein cooperate in the maintenance of mitochondrial function during yeast aging. *Acta Biochim. Pol.* **50**: 1039-1056.

Guillas, I., **Kirchman, P.A.**, Chuard, R., Pfefferli M., Jiang, J.C., Jazwinski, S.M., and Conzelmann, A. (2001) C26-CoA-dependent ceramide synthesis of *Saccharomyces cerevisiae* is operated by Lag1p and Lac1p. *EMBO J.* **20**: 2655-2665.

Kirchman, P.A., S. Kim, and S.M. Jazwinski. (1999) Interorganelle signaling is a determinant of longevity in *Saccharomyces cerevisiae*. *Genetics* **152**:179-190.

Kim, S., **P.A. Kirchman**, A. Benguria, and S.M. Jazwinski. (1999). Experimentation with the yeast model. in **Methods in Aging Research**. (B.P. Yu ed.), CRC Press, Boca Raton, pp. 191-213.

Shama, S., **P.A. Kirchman**, J.C. Jiang, and S.M. Jazwinski. (1998). Role of *RAS2* in recovery from chronic stress: effect on yeast life span. *Exp. Cell Res.* **245**:368-378.

Jiang, J.C., **P.A. Kirchman**, M. Zagulski, J. Hunt, and S.M. Jazwinski. (1998). Homologues of the yeast longevity gene *LAG1* in *Caenorhabditis elegans* and human. *Genome Res.* **8**:1259-1272.

Kim, S., J.C. Jiang, **P.A. Kirchman**, I. Rubelj, E.G. Helm, and S.M. Jazwinski. (1998). Cellular and Molecular Aging. in **Comprehensive Geriatric Oncology**, second edition, (L. Balducci, W.B. Ershler, G.H. Lyman, eds.) Harwood Academic Publishers. pp. 123-155.

Rahman, I., M. Shahamat, **P.A. Kirchman**, E. Russek-Cohen, and R.R. Colwell. (1994). Methionine uptake and cytopathogenicity of viable but nonculturable *Shigella dysenteriae* Type 1. *Appl. Environ. Microbiol.* **60**:3573-3578.

Kirchman, P.A., H. DeGrazia, E.M. Kellner, and C.P. Moran Jr. (1993). Forespore-specific disappearance of the sigma-factor antagonist SpoIIAB: implications for its role in determination of cell fate in *Bacillus subtilis*. *Mol. Microbiol.* **8**:663-671.

Satola, S., **P.A. Kirchman**, and C.P. Moran Jr. (1991). Spo0A binds to a promoter used by a σ^A RNA polymerase during sporulation in *Bacillus subtilis*. *Proc. Natl. Acad. Sci.* **88**:4533-4537.

Kenney, T.J., **P.A. Kirchman**, and C.P. Moran Jr. (1988). Gene encoding σ^E is transcribed from a σ^A -like promoter in *Bacillus subtilis*. *J. Bacteriol.* **170**:3058-3064.

Scott, J.R., **P.A. Kirchman**, and M.G. Caparon. (1988). An intermediate in transposition of the conjugative transposon Tn916. *Proc. Natl. Acad. Sci.* **85**:4809-4813.

Abstracts

Kirchman, P.A. (2014) Lifespan Extension of *S. cerevisiae* grown in proximity to *E. coli*. Presented at the San Antonio Nathan Shock Center Conference on Aging: The Microbiome of Aging and Age-Related Disease. October 16-19, 2014. Bandera, Texas.

Botta, G., **P.A. Kirchman** (2008) Iron Supplementation Through Multiple Pathways Leads to Life Span Extension in *S. cerevisiae*. Presented at the Cold Spring Harbor Molecular Genetics of Aging meeting. September 24-27, 2008, Cold Spring Harbor, New York.

Kirchman, P.A., Botta, G. (2006) Copper and Mitochondrial Genotype Influence Yeast Longevity. Presented at the Gordon Research Conference on the Biology of Aging. January 29-February 3, 2006, Ventura Beach, California.

Kirchman, P.A. (2004) Analysis of the Influence of Mitochondrial DNA Point Mutations on Longevity in *Saccharomyces Cerevisiae*. Presented at the 33rd annual meeting of the American Aging Association. June 4-7, 2004, St. Petersburg, Florida.

Burdge, J., S. Fitchett, M. wa Githinji, B. Green, T. Hopkins, **P. Kirchman**, L. McNulty, B. Mellor, J. Moore, B. O'Brian, S. Richardson, M. Rupright, and J. Wetterer. (2004). Discovery-Based Science and Math in an Environmental and Community Context. National Science Foundation Course, Curriculum, and Laboratory Improvement Conference. April 15-18, 2004, Arlington, Virginia.

Kirchman, P.A. (2001). Growth Medium and Mitochondrial Genotype Influence Replicative Lifespan in *Saccharomyces cerevisiae*. American Society for Microbiology 101st General Meeting. May 20-24, 2001, Orlando, Florida.

Kirchman, P.A. and S.M. Jazwinski. (1998). Increased Metabolic Capacity and Delayed Senescence in Yeast. 98th General Meeting of the American Society for Microbiology, Atlanta, Georgia.

Kirchman, P.A. and S.M. Jazwinski. (1998). Intracellular Signalling: A Determinant of Yeast Longevity. Gordon Research Conference on the Biology of Aging, Il Ciocco, Italy.

Jazwinski S.M., **P.A. Kirchman**, R.L. West, J.C. Jiang, S. Kim, C.-Y. Lai, A. Benguria, and S. Shama. (1998). Longevity determining processes in Yeast. Meeting on Genetics of Aging, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, p. 3.

Jazwinski S.M., **P.A. Kirchman**, R.L. West, S. Kim, J.C. Jiang, S. Shama, C.-Y. Lai, and A. Benguria. (1998). Genes responsible for longevity in yeast. 29th Annual Meeting of the American Society for Neurochemistry, Denver, Colorado.

Jazwinski S.M., **P.A. Kirchman**, S. Kim, S. Shama, J.C. Jiang, R.L. West, C.-Y. Lai, and A. Benguria. (1997). Genes of Youth: Genetic analysis of Aging using yeast. *The Gerontologist* **37**:47.

Kirchman, P.A., S. Shama, R.L. West, S. Kim and S.M. Jazwinski. (1997). Interaction of factors affecting the life span of *Saccharomyces cerevisiae*. *Mol. Biol. Cell.* **8**:151a.

Kirchman, P.A., J.C. Jiang, S. Kim, R. West, and S.M. Jazwinski. (1997). Interaction of *PHB1* and *RAS2* with mitochondria in determining yeast life span. Cold Spring Harbor Laboratory Meeting on Yeast Cell Biology. Cold Spring Harbor, New York. p. 202.

Jazwinski, S.M., **P.A. Kirchman**, S. Kim, S. Shama, J.C. Jiang, R.L. West, C-Y Lai, A. Benguria. (1997). Genes of Youth: Genetic Analysis of Aging Using Yeast. 16th Congress of the International Association of Gerontology, Adelaide, Australia. p. 28-29.

Jazwinski, S.M., **P.A. Kirchman**, S. Kim, S. Shama, J.C. Jiang, R.L. West, C-Y Lai, A. Benguria. (1997). Signal Transduction and Yeast longevity: A Genetic Analysis. 16th Congress of the International Association of Gerontology, Singapore Pre Congress Satellite, Singapore. p. 21-22.

West, R., **P.A. Kirchman**, S.M. Jazwinski. (1997). The effect of the *Saccharomyces cerevisiae* *PHB2* gene on Yeast longevity, Southeast Regional Yeast Meeting. University of Southern Mississippi Gulf Park Conference Center, Long Beach, Mississippi. p. 8.

Kirchman, P.A., J.C. Jiang, S. Kim, and S.M. Jazwinski. (1997). Association of Aging and Mitochondrial Function Revealed by Yeast *PHB1*. Gordon Conference on Biology of Aging. Ventura, California.

S.M. Jazwinski, **P.A. Kirchman**, S. Kim, J.C. Jiang, S. Shama, J.G. Delamatre, R.L. West, C-Y. Lai, A. Benguria. (1996). Longevity, genes, and aging from the perspective of a Yeast. *Mol. Biol. Cell.* **7**:7a.

Kirchman, P.A. and S.M. Jazwinski. (1996). *LAG1* and *LAC1* are homologous genes involved in determining the replicative life span of the budding yeast, *Saccharomyces cerevisiae*. *FASEB J.* **10**:A1517.

Kirchman, P.A., S. Kim, and S. Michal Jazwinski. (1996) Prohibitin, Mitochondria and *RAS2* in Yeast Longevity. Southeast Regional Yeast Meeting. University of Southern Mississippi, Hattiesburg, Mississippi. p. 8.

Kirchman, P.A. and S.M. Jazwinski. (1996). *LAG1* and *LAC1* are homologous genes involved in determining the replicative life span of the budding yeast, *Saccharomyces cerevisiae*. 96th General Meeting, American Society for Microbiology. New Orleans, Louisiana. p. 519.

Kirchman, P.A., B. Royals, D. Franklin, J. Sun, S. Kale, and S.M. Jazwinski. (1995). Genetic analysis of longevity in Yeast. Southeast Regional Yeast Meeting, University of Southern Mississippi, Hattiesburg, Mississippi. p. 20.

Kirchman, P.A., R. Coppolecchia, H. Degrazia, and C.P. Moran Jr. (1991). Two roles for SpoIIAB in sporulating *Bacillus subtilis*. The Sixth International Conference on Genetics and Biotechnology of Bacilli. Stanford University, California. p. W-16.

Satola, S., **P.A. Kirchman**, and C.P. Moran Jr. (1991). Spo0A binds to a promoter used by σ^A RNA polymerase during sporulation in *Bacillus subtilis*. 91st General Meeting, American Society for Microbiology, Dallas, Texas.

Moran, C.P., S. Satola, T.J. Kenney, R. Coppolecchia, H. DeGrazia, and **P.A. Kirchman**. (1990). Regulation and roles of stage II genes during endospore development. International Conference on the *Bacillus subtilis* genome. Paris, France.

Kenney, T.J., **P.A. Kirchman**, S. Satola, and C.P. Moran Jr. (1989). Transcription of the *spoIIG* operon in *Bacillus subtilis*. The Fifth International Conference on Genetics and Biotechnology of Bacilli. Pacific Grove, California. p. W-7.

Professional Activities

Invited speaker, "Mitochondrial metabolism, mitochondrial DNA polymorphism, and oxidative stress influences on cellular aging" Neuroscience and Development workgroup meeting, Florida Atlantic University, February 27th, 2008.

Invited Speaker, "The Biology of Aging" The Benjamin School, February 23rd, 2007.

Invited Speaker, "Mitochondrial Influences on Aging in *Saccharomyces cerevisiae*" Science in Progress Seminar Series, Center for Molecular Biology and Biotechnology, Florida Atlantic University, October 19th, 2005.

Invited Speaker, "Mitochondrial DNA and Aging" Science in Progress Seminar Series, Center for Molecular Biology and Biotechnology, Florida Atlantic University, November 15th, 2000.

Invited Speaker, "Increased Metabolic Capacity and Delayed Senescence in Yeast", 98th General Meeting of the American Society for Microbiology, Atlanta, Georgia, May 19th, 1998.

Invited Speaker, "Intracellular Communication: A Determinant of Yeast Longevity", Gordon Research Conference on the Biology of Aging, Il Ciocco, Italy, May 14th, 1998.

Invited Speaker, "Prohibitin, Ras, and Mitochondria.", New Orleans Area Yeast Meeting, Tulane University, November 26th, 1996.

Senior Theses Advised

Jessica Keith - Effects of mtDNA Mutations on Growth Rate in *Saccharomyces cerevisiae*

Sandra Siller - Evolution of Yeast Mn-SOD with Improved Activity via Error-Prone PCR

Maureen Lalonde – Construction of *Saccharomyces cerevisiae* Strains with Altered Levels of Manganese Superoxide Dismutase Activity

Shell Persaud-Vazquez – Construction of a Yeast Strain Containing an Allele of *SOD2* with Increased Activity

Shane Sandford – Deletion of Superoxide Dismutase 1 from *Saccharomyces cerevisiae* to Study the Free Radical Theory of Aging

Maria Vizcaino - Isolation and Structure Determination of Cytotoxic Compounds from a Sponge of the Family Plankinidae

Kayley Malencia - Inducible Expression of Yeast Manganese Superoxide Dismutase in *E. coli*

Kristen Morell, - Generation of Yeast Mn-SOD Mutants with Increased Activity by Error-Prone PCR

Hiyam Ahmad – A Comparison of the Effects of Manganese and Copper-Zinc Superoxide Dismutases on *Saccharomyces cerevisiae* Growth and Survival

Gabriela Botta – Copper Supplementation Extends Yeast Life Span Under Conditions Requiring Respiratory Metabolism

Stacy Crawford – Telomerase Localization to the Mitochondria in Yeast May Induce Mitochondrial DNA Mutations

Kari Edelson - The Effects of Mitochondrial DNA Mutations and Membrane Potential Uncoupling on the Metabolic Activity of Yeast

Erin Kidwell - The Induction and Resuscitation of *E. coli* into and From the “Viable but Non-Culturable” State

Alex Algarin – Effect of Carbonyl cyanide m-chlorophenylhydrazone on Mitochondrial Metabolism and Budding Rate of *Saccharomyces Cerevisiae* in solid and liquid media

Sona Bhatti – Construction of Yeast Strain to Analyze the Effects of Telomerase Export to the Mitochondria

Matt Brentnall – Effects of mitochondrial uncoupling on life span and gene expression of *Saccharomyces cerevisiae*

Roy Kiberenge – PCR-mediated disruption of the *SOD1* gene to study the effects of cytochrome c oxidase in copper-dependent lifespan extension

Sarah Wiggill – The Directed Evolution of Copper/Zinc Superoxide Dismutase

Elina Kilevskaya – Analysis of Manganese Superoxide Dismutase Mutants

Rachel Guillaume – Using yeast as a model of diabetes: Testing the effects of glyoxalase mutants

Amber Brittain – Development of a protocol to analyze SOD mutants

Kevin McCaffrey – Genetic Alteration of Superoxide Dismutase in Order to Increase Longevity in Yeast Cells

Peter Pantina – Mitochondrial and nuclear genome interactions in *Saccharomyces cerevisiae*

Titilola Sode – Active telomerase export to the mitochondria in *S. cerevisiae*

Mario Mayes – Nuclear Suppression of Mitochondrial Defects in *Saccharomyces cerevisiae*

Ricardo Martin – Construction of Mitochondrion-targeted Telomerase for Analysis in *Saccharomyces cerevisiae*

Zachary Virgin – Generation of Hyperactive Manganese Superoxide Dismutase Mutants by Error-Prone PCR

Therese Rytz – Cloning *SOD2* from the Red-eared Slider *T. scripta*

Robert Linder - Assaying Iron Content of *Saccharomyces cerevisiae*

Kateryna Kiselova - Analysis of Manganese Superoxide Dismutase Mutants in Yeast

Robert Anderson - Optimizing Atrazine Catabolism in *Pseudomonas* sp. strain ADP

Alejandro Landa – Cloning of the Manganese Superoxide Dismutase Gene (*SOD2*) from *T. scripta*

Richard Kolibas - Developing an Assay to Assess the Activity of Yeast Superoxide Dismutase in *E. coli*

Paloma Reiter – Activity Analysis of Manganese Superoxide Dismutase Mutants

Evgeny Idrisov - Antisense RNA Transcripts

Sarah Salem – Analysis of Mutant Manganese-Superoxide Dismutase on the Lifespan of *Saccharomyces cerevisiae*

Didier Alexander - Assaying Mutant Marine Bacteria for Lithium Extraction

Eric Bishop – Isolation of the methionine sulfoxide reductase B3 (*MSRB3*) gene from the red-eared slider, *Trachemys scripta elegans*

Melissa Kwan - The Effect of Mutated Aconitase on Yeast Longevity

Jairo Sanchez – Cloning of the Manganese Superoxide Dismutase Gene (*SOD2*) from *T. scripta*

Steve Nunes - Creation of an Aconitase Overexpression Strain of *Saccharomyces cerevisiae* for Lifespan Analysis

Rafael Paez - Iron and Mitochondrial Aging

Jessica Battle - Lowering oxidative stress with increased methionine content of mitochondrial aconitase

Daniel Velásquez - Lifespan Analyses of Yeast Strains Harboring Mutations Affecting Metabolism

Imarhia Enogieru – Some Like it Hot: The Isolation of an Aconitase Mutant Resistant to Heat Shock-Induced Oxidative Stress

Robert Airapetov - Confirmation of the Existence of KAR, HAB, EAR, and PP in the Lipid Metabolisms of *Clamydomonas Reinhardtii* and *Volvox Carteri* f. *Nagariensis*

Courses Taught

Biological Principles, Genetics, Microbiology and Microbiology Laboratory, Scientific Writing II, Biotechnology Laboratory I, Life Science, How and Why We Age, Science and Math Seminar, Genetic and Social Sciences, Molecular Cell Biology, Bioethics