Roy Dickenson Welch III

Department of Biology, Syracuse University
107 College Place, Room 247 LSC, Syracuse, NY 13244
+1.315.439.9615, rowelch@syr.edu

EDUCATION

1999 - 2003	*Postdoctoral Research Fellow*, Departments of Biochemistry and Developmental Biology, Stanford University, Advisor Prof. Dale Kaiser.
1990 - 1997	*Doctor of Philosophy*, Department of Biochemistry, University of Wisconsin - Madison, Advisor Prof. Jack Gorski.
1984 - 1988	*Bachelor of Science*, Department of Biochemistry, State University of New York at Stony Brook, Advisor Prof. Frank Erk

POSITIONS

2009 - present	*Associate Professor*, Departments of Biology (primary) and Chemistry, Syracuse University, Syracuse, NY.
2011 - 2013	*Visiting Scientist*, National Science Foundation, Directorate for Biological Sciences, Division of Molecular and Cellular Biosciences, Genetic Mechanisms Cluster, Molecular and Cellular Evolution Panel.
2003 - 2009	*Assistant Professor*, Departments of Biology (primary) and Chemistry, Syracuse University, Syracuse, New York.
1998	*Visiting Professor*, Department of Biology, Beloit College, Beloit, Wisconsin.
1988 - 1990	*Research Assistant*, Laboratory of Prof. Piero Rinaldo, Department of Human Genetics, Yale University, New Haven, Connecticut.

DISTINCTIONS

2008	NSF CAREER Award
2000	National Institute of Health National Research Service Award (NIH-NRSA)
1999	Stanford University Department of Biochemistry Postdoctoral Fellowship
1995	Syracuse University Day of Discovery Keynote Speaker
1993	University of Wisconsin - Madison Biochemistry NIH Training Grant (Training in the Biochemistry of Reproduction

CONTRIBUTIONS TO SCIENCE

1. **PATTERN FORMATION: understanding microbial biofilm formation**: described *M. xanthus* aggregation as a form of Ostwald ripening; established multicellularity as required for *M. xanthus* chemotaxis; identified first biological non-Zhabotinsky waves (*Nat Phys*: www.nature.com/physics/highlights/6868-4.html).
2. **GENOTYPE-TO-PHENOTYPE (G2P): connecting the *M. xanthus* genome and phenome:** created first *M. xanthus* draft genome and microarray; developed bioinformatics tools to aid in *M. xanthus* genome annotation; characterized genes and gene families; generated evolutionary statistical model for *M. xanthus* G2P map.

3. **MODEL ORGANISM DATABASES (MODs): developing web tools for microbial genome annotation:** developed Wiki-style MOD for *M. xanthus*: expanded it to include multiple organisms; replaced annotation software for the GENI project (http://geni-science.org/) initiated by the Joint Genome Institute.
4. **MICROBIAL GENOME ANNOTATION: contributing to microbial genome assembly and annotation:** *Myxococcus, Sorangium, Xenorhabdus, Photorhabdus, Agrobacterium*, *Epulopiscium*.

PROFESSIONAL SERVICE

Research Community/Outreach

2014 - 2015	*Designer / lead*	GeniACT microbial model organism database (MOD) software.
2013 - present	*Creator*	*Myxococcus xanthus* mutant strain knockout library
2009 - 2015	*Founder / lead*	XanthusBASE MOD for *Myxoccocus xanthus* research community.

Funding

2015	*Panelist*	National Science Foundation Prokaryote Gene Regulation Panel
2014	*Panelist*	National Science Foundation Genetic Mechanisms Career Panel
2011 - 2013	*Visiting Scientist*	National Science Foundation (MCB)
2011	*Participant*	NSF Alliance for Graduate Education and the Professoriate Meeting
2010	*Panelist*	National Science Foundation Molecular Evolution and Genomics Panel
2009	*Panelist*	National Science Foundation Genes and Genomes Systems Panel

Peer Review

2015	*Invited Editor*	*mBio*
2015 - present	*Editorial Board*	*Scientific Reports*
2013 - present	*Editorial Board*	*Frontiers in Microbiology*
2008 - present	*Editorial Board*	*Journal of Bacteriology*
2003 - present	*ad hoc reviews*	*Amino Acids, Applied Environmental Microbiology, Microbial Ecology, Molecular Microbiology, PLoS Biology, PLoS Computational Biology, PLoS ONE, Nature, National Institutes of Health, Science*

Committees

2010	*Organizer*	38th International Conference on the Biology of the Myxobacteria
2009	*Organizer*	I2CAM: Soft Active Materials: From Granular Rods to Flocks, Cells and Tissues
2006 - 2011	*Member*	Bristol Myers Squibb Institutional Biosafety Committee

UNIVERSITY SERVICE

Committees

2014 - present	*Chair*	Biochemistry Planning Committee
2014 - present	*Chair*	Biochemistry Steering Committee
2014 - present	*Chair*	Grad Student and Postdoc Career Advising Committee
2014 - present	*Member*	Awards Committee
2012 - present	*Member*	Tenure Committee - Susan Parks
2011	*Chair*	Joint A&S / Education 3rd Year Tenure Review Committee
2008 - 2014	*Member*	Tenure Committee - Jason Wiles
2010	*Member*	Dean's Vision Committee
2009	*Member*	Biotechnology Exploratory Committee
2009	*Member*	Department of Biology Vision Committee
2009	*Member*	Faculty Search Committee

2008	*Member*	Faculty Search Committee

University Presentations

2010 - 2013	*presenter*	Office of Sponsored Programs Awareness Series
2011	*presenter*	Introduction to Biological Research at Syracuse University

Voluntary Undergraduate Service

2015	*Advisor*	First Year Undergraduate Advising
2007 - present	*Instructor*	First Year Forum Instructor

GRANTS / FELLOWSHIPS

ACTIVE

Syracuse University Office of Research — PI — $6,000 — 2015
Creating 3D printing K-12 education training program

National Science Foundation (NSF) DBI-1244295 — PI — $864,077 — 2013-17
A Quantitative Analysis of Phenotype in a Multicellular Prokaryote

National Science Foundation (NSF) EFRI-1106933 — CoPI — $181,145 — 2011-15
Deciphering and Controlling the Signal Processes in Bacterial Multicellular Systems and Bacteria-Host Interactions

COMPLETED (three years previous)

National Science Foundation (NSF) MCB 0746066 — PI — $785,781 — 2008-12
CAREER: Characterization of Transcriptional Activators that Regulate Emergent Behavior

(NSF) MCB-1032391	Supplement	$12,000	2010
(NSF) MCB-1032379	Supplement	$9,495	2010

PUBLICATIONS

1. Smith M, Bahar F, Wilson L, Welch RD. 2015. Separating Rippling, Aggregation, and Motility in *M. xanthus* Biofilms. (*in prep*)
2. Pratt-Szeliga PC, Bahar F, Shaevitz J, Welch RD. 2015. Modeling the Effect of Genetic Changes on *M. xanthus* Development Through Machine Learning. (*in prep*)
3. Bahar F, Pratt-Szeliga PC, Guo J, Angus S, Welch RD. 2014. Describing *Myxococcus xanthus* Aggregation Using Ostwald Ripening Equations for Thin Liquid Films. *Scientific Reports*. doi:10.1038/srep06376.
4. Yan J, Bradley M, Welch RD. 2014. Phenotypic profiling of ABC transporter coding genes in *Myxococcus xanthus*. *Frontiers in Microbiology*. doi:10.3389/fmicb.2014.00352
5. Harvey CW, Igoshin OA, Welch RD, Alber M, Shimkets LJ. 2014. Computational Biology: From Observation to Statistical Image Analysis to Modeling and Back to Biology. In: Yang Z and Higgs PI (ed). *Myxobacteria: Genomics, Cellular and Molecular Biology* (Chapter 8). Caister Academic Press: Norfolk, UK: Publisher. ISBN: 978-1-908230-34-8
6. Skewes AD, Welch RD. 2013. A Markovian Analysis of Genome Sequence Constraints. *PeerJ*. doi:10.7717/peerj.127
7. Pratt-Szeliga PC, Laverdière MA, Merlo E, Fawcett JW, Welch RD. 2013. Soot Class Loading in the Rootbeer GPU Compiler. *Proceedings of the 2nd ACM SIGPLAN International Workshop on State Of the Art in Java Program analysis (SOAP '13)*. doi:10.1145/2487568.2487573

8. Yan J, Garza AG, Bradley MD, Welch RD. 2012. A clpC/HSP100 Chaperone Functions in *Myxococcus xanthus* Sporulation and Self-organization. *Journal of Bacteriology*. doi:10.1128/JB.06492-11
9. Pratt-Szeliga PC, Fawcett JW, Welch RD. 2012. Rootbeer: Seamlessly using GPUs from Java. *14th IEEE International Conference on High Performance Computing and Communications (HPCC-2012)*. doi:10.1109/HPCC.2012.57
10. Chaston JM, Suen G, Tucker SL, Andersen AW, Bhasin A, Bode E, Bode HB, Brachmann AO, Cowles CE, Cowles KN, Darby C, Le´on L, Drace K, Du Z, Givaudan A, Tran EEH, Jewell KA, Knack JJ, Krasomil-Osterfeld KC, Kukor R, Lanois A, Latreille P, Leimgruber NK, Lipke CM, Liu R, Lu X, Martens EC, Marri PR, Me´digue C, Menard ML, Miller NM, Morales-Soto N, Norton S, Ogier JC, Orchard SS, Park D, Park Y, Qurollo BA, Sugar DR, Richards GR, Rouy Z, Slominski B, Slominski K, Snyder H, Tjaden BC, van der Hoeven R, Welch RD, Wheeler C, Xiang B, Barbazuk B, Gaudriault S, Goodner B, Slater SC, Forst S, Goldman BS, Goodrich-Blair H. 2011. The Entomopathogenic Bacterial Endosymbionts Xenorhabdus and Photorhabdus: Convergent Lifestyles from Divergent Genomes. *PLoSONE*. doi:10.1371/journal.pone.0027909
11. Zhang H, Angus S, Tran M, Xie C, Igoshin OA, Welch RD. 2011. Quantifying Aggregation Dynamics During *Myxococcus xanthus* Development. *Journal of Bacteriology*. doi:10.1128/JB.05188-11
12. Pratt-Szeliga PC, Skewes AD, Yan J, Welch LG, Welch RD. 2011. Xanthusbase After Five Years Expands to Become Openmods. *Nucleic Acids Research*. doi:10.1093/nar/gkr1054
13. Taylor RG, Welch RD. 2010. Recording Multicellular Behavior in *Myxococcus xanthus* Biofilms using Time-Lapse Microcinematography. *Journal of Visualized Experiments*. doi:10.3791/2038
14. Slater SC, Goldman BS, Goodner B, Setubal JC, Farrand SK, Nester EW, Burr T, Banta L, Dickerman AW, Paulsen I, Otten L, Suen G, Welch RD, Almeida NF, Arnold F, Burton OT, Du Z, Ewing A, Godsy E, Heisel S, Houmiel KL, Jhaveri J, Lu J, Miller NM, Norton S, Chen Q, Phoolcharoen W, Ohlin V, Ondrusek D, Pride N, Stricklin SL, Sun J, Wheeler C, Wilson L, Zhu H, Wood DW. 2009. Genome sequences of three Agrobacterium biovars elucidate the evolution of multi-chromosome genomes. *Journal of Bacteriology*. doi:10.1128/JB.01779-08
15. Welch L, Welch RD. 2009. If You Build It, They Might Come. *Nature Reviews Microbiology*. doi:10.1038/nrmicro2086
16. Hu JC, Aramayo R, Bolser D, Conway T, Elsik CG, Gribskov M, Kelder T, Kihara D, Knight TF Jr, Pico AR, Siegele DA, Wanner BL, Welch RD. 2008. The Emerging World of Wikis. doi: 10.1126/science.320.5881.1289b
17. Taylor RG, Welch RD. 2008. Chemotaxis as an Emergent Property of a Swarm. *Journal of Bacteriology*. doi:10.1128/JB.00662-08
18. Schneiker S, Perlova O, Aysel A, Altmeyer MO, Bartels D, Bekel T, Beyer S, Blocker H, Bode E, Bode HB, Bolton C, Choudhuri JV, Doss S, Elnakady YA, Frank B, Gaigalat L, Gerth K, Goesmann A, Groeger C, Gross F, Jelsbak L, Jelsbak L, Kaiser O, Kalinowsky J, Kegler C, Knauber T, Konietzny S, Kopp M, Krause L, Krug D, Linke B, Mahmud T, Martinez-Arias R, McHardy AC, Merai M, Meyer F, Mormann S, Muñoz-Dorado J, Perez J, Rachid S, Raddatz G, Rosenau F, Rückert C, Sasse F, Scharfe M, Schuster Sc, Suen G, Treuner-Lange A, Velicer GJ, Vorhölter F-J, Weismann KJ, Welch RD, Wenze SC, Whitworth DE, Wilhelm S, Wittmann C, Puhle A, Müeller R. 2007. Complete sequence of the Largest known Bacterial Genome from the Myxobacterium *Sorangium cellulosum*. *Nature Biotechnology*. doi:10.1038/nbt1354
19. Curtis PD, Taylor RG, Welch RD, Shimkets LJ. 2007. Spatial Organization of *Myxococcus xanthus* during Fruiting Body Formation. *Journal of Bacteriology*. doi:10.1128/JB.01008-07.
20. Suen G, Goldman BS, Welch RD. 2007. A Post-Genomic Overview of the Myxobacteria. In: Whitworth, D.E. ed., *Myxobacteria: Multicellularity and Differentiation* (Chapter 17). American Society for Microbiology Press: Washington, D.C., USA: Publisher. ISBN: 978-1-55581-420-5

21. Suen G, Goldman BS, Welch RD. 2007. Predicting Prokaryotic Ecological Niches using Genome Sequence Analysis. *Public Library of Science ONE*. doi: 10.1371/journal.pone.0000743
22. Suen G, Arshinoff BI, Taylor RG, Welch RD. 2007. Practical Applications of Bacterial Functional Genomics. *Biotechnology & Genetic Engineering Reviews*. doi:10.1080/02648725.2007.10648101
23. Arshinoff BI, Suen G, Just E, Merchant S, Kibbe W, Chisholm R, Welch RD. 2007. XanthusBase: Adapting Wikipedia Principles to a Model Organism Database. *Nucleic Acids Research*. 35 (Database Issue): doi:10.1093/nar/gkl881.
24. Suen G, Jakobsen JS, Goldman BS, Singer M, Garza AG, Welch RD. 2006. Bacterial Post-Genomics: The Promise and Peril of Systems Biology. *Journal of Bacteriology*. doi:10.1128/JB.01195-06.
25. Srinivasan BS, Caberoy NB, Suen G, Taylor RG, Shah R, Tengra F, Goldman BS, Garza AG, Welch RD. 2005. Functional genome annotation through phylogenomic mapping. *Nature Biotechnology.* doi:10.1038/nbt1098.
26. Jakobsen JS, Jelsbak L, Jelsbak L, Welch RD, Cummings C, Goldman B, Stark E, Slater S, Kaiser D. 2004. Sigma54 enhancer binding proteins and *Myxococcus xanthus* fruiting body development. *Journal of Bacteriology.* doi:10.1128/JB.186.13.4361-4368.2004.
27. Igoshin O, Welch RD, Kaiser D, Oster G. 2004. Waves and aggregation patterns in Myxobacteria. *PNAS.* doi: 10.1073/pnas.0400704101.
28. Kaiser D, Welch RD. 2004. Dynamics of fruiting body morphogenesis. *Journal of Bacteriology*. doi:10.1128/JB.186.4.919-927.2004.
29. Caberoy NB, Welch RD, Jakobsen JS, Slater SC, Garza AG. 2003. A global mutational analysis of NtrC-like activators in *Myxococcus xanthus*: identifying activator mutants defective for motility and fruiting body development. *Journal of Bacteriology*. doi:10.1128/JB.185.20.6083-6094.2003.
30. Welch RD, Kaiser D. 2001. Cell behavior in traveling wave patterns of myxobacteria. *PNAS.* doi:10.1073/pnas.261574598.
31. Igoshin OA, Mogilner A, Welch RD, Kaiser D, G Oster. 2001. Pattern formation and traveling waves in myxobacteria: theory and modeling. *PNAS.* doi:10.1073/pnas.221579598.
32. Welch RD, Gorski J. 1999. Regulation of glucose transporters by estradiol in the immature rat uterus. *Endocrinology*. doi:10.1210/endo.140.8.6923.
33. Welch RD, Anderson IA, Gorski J. 1999. Simultaneous Measurement of Multiple mRNAs with a Single Control by Quantitative Competitive Reverse Transcriptase-Polymerase Chain Reaction: Glucose Transporters Glut1 and Glut4. *Analytical Biochemistry*. doi:10.1006/abio.1998.3055.
34. Welch RD. 1998. Designing a compact textbook. *Bioscience*. doi: 10.2307/1313428.
35. Fritsch M, Welch RD, Murdoch FE, Anderson I, Gorski J. 1992. DNA allosterically modulates the steroid binding domain of the estrogen receptor. *Journal of Biological Chemistry*. 267(3): 1823-8. PMID: 1730720.
36. Rinaldo P, Welch RD, Previs SF, Schmidt-Sommerfeld E, Gargus JJ, O'Shea JJ, Zinn AB. 1991. Ethylmalonic/adipic aciduria: effects of oral medium-chain triglycerides, carnitine, and glycine on urinary excretion of organic acids, acylcarnitines, and acylglycines. *Pediatric Research*. doi:10.1203/00006450-199109000-00002.
37. Giordano G, McMurray WJ, Previs SF, Welch RD, Rinaldo P. 1990. Identification of 2-(2'-octenyl) succinic acid in urine. *Rapid Communications in Mass Spectrometry*. doi:10.1002/rcm.1290040509.
38. Rinaldo P, O'Shea JJ, Welch RD, Tanaka K. 1990. The enzymatic basis for the dehydrogenation of 3- phenyl-propionic acid: in vitro reaction of 3-phenylpropionyl-CoA with various acyl-CoA dehydrogenases. *Pediatric Research.* doi:10.1203/00006450-199005000-00017.

39. Rinaldo P, O'Shea JJ, Welch RD, Tanaka K. 1990. Diagnosis of medium chain acyl-CoA dehydrogenase deficiency by stable isotope dilution analysis of urinary acylglycines: retrospective and prospective studies, and comparison of its accuracy to acylcarnitine identification by FAB/mass spectrometry. *Progress in Clinical & Biological Research*. 321: 411-8, 1990. PMID: 2326302.

40. Rinaldo P, O'Shea JJ, Welch RD, Tanaka K. 1989. Stable isotope dilution analysis of n-hexanoylglycine, 3-phenylpropionylglycine and suberylglycine in human urine using chemical ionization gas chromatography/mass spectrometry selected ion monitoring. *Biomedical & Environmental Mass Spectrometry*. doi:10.1002/bms.1200180705.

INVITED PRESENTATIONS

1. "Transitioning from JGI IMG-ACT to the OpenMODs platform." MGAN Governing Board Meeting, Augustana College, August 23-25, 2013. Host Prof. Lori Scott.
2. "Addressing the Genotype to Phenotype Problem in a Self-Organizing Multicellular Prokaryote." National Science Foundation, April 8, 2011. Host Dr. Parag Chitnis.
3. "The Genotype to Phenotype Problem: Reverse Engineering the Genetics of Pattern Formation in a Multicellular Prokaryote." Science At The Edge (SATE), Michigan State University, November 19, 2010. Host Prof. Lee Kroos.
4. "Complementary Approaches to Reverse Engineer Cell-Cell Interaction Networks in *Myxococcus xanthus*." The Molecular Genetics of Bacteria and Phages. August 4-9, 2009.
5. "Genomics of Emerging Order Within a Biofilm." Soft Active Materials: I2CAM: From Granular Rods to Flocks, Cells, and Tissues. May 18-23, 2009.
6. Measuring Order Within a *Myxococcus xanthus* Swarm at Different Scales." Department of Microbiology, Cornell University. April 9, 2009. Host: Prof. Esther Angert
7. "The genomics of self-organization and development control in Myxobacteria." Bristol-Myers Squibb Company, May 6, 2008. Host: Dr. Shu-Jen Chiang.
8. "Wiki-based annotations in XanthusBase." EcoliHub U24 Annual Steering Committee Meeting, Chicago, IL, September 6, 2007. Host: Prof. Barry Wanner.
9. "Group Taxis in a multicellular prokaryote." Bryce Thompson Institute for Plant Research, Cornell University, April 12, 2007. Host: Patrice Dubois.
10. "Functional genomics of self-organization in *Myxococcus xanthus*." Department of Microbiology, University of Washington, December 5, 2006. Host: Prof. Eugene Nester.
11. "Functional genome annotation in *Myxococcus xanthus*." Department of Pharmaceutical Biotechnology, Saarland University, November 15, 2005. Host: Prof. Rolf Müller.
12. "Mesoscale annotation of a self-organizing prokaryote." Max Planck Institute for Terrestrial Microbiology, November 14, 2005. Host: Dir. Lotte Søgaard-Anderson.
13. "Using Phylogenomic mapping to annotate the genome of *Myxococcus xanthus*." Department of Applied Biological Science, Arizona State University, October 28, 2005. Host: Prof. Steve Slater.
14. "Functional genomics of the self-organizing prokaryote *Myxococcus xanthus*." The Interdisciplinary Center for the Study of Biocomplexity Series, University of Notre Dame, December 7, 2004. Host: Prof. Mark Alber.
15. "Mesoscale Annotation of the prokaryote *Myxococcus xanthus* through phylogenomic mapping." Department of Bacteriology Distinguished Lectures in Microbiology, University of Wisconsin-Madison, December 2, 2004. Host: Prof. Heidi Goodrich-Blair.

16. "A Generalizeable form of Mesoscale Annotation." Department of Biology, Washington University in St. Louis, October 13, 2004. Host: Prof. Robert Kranz.
17. "Phylogenomic Mapping in *Myxococcus xanthus*." Monsanto Company, St. Loius, MO, October 12, 2004. Host: Dr. Barry Goldman.
18. "Functional Phylogenomics in *Myxococcus xanthus*." School of Dentistry, University of California Los Angeles, August 21, 2004. Host: Prof. Wenyuan Shi.

NSF OUTREACH PRESENTATIONS (2011 - 2013)

1. Colgate University
2. State University of New York at Geneseo
3. St. Lawrence University
4. Clarkson University
5. Elmira College
6. Ithica College
7. LeMoyne College
8. SUNY Environmental Science and Forestry
9. Virginia Polytechnic Institute and State University
10. 39th Conference on the Biology of the Myxobacteria
11. 2012 West Coast Bacterial Physiology Meeting

RECENT CONFERENCES

1. 2015 Molecular Genetics of Bacteria and Phages Meeting (2015)
2. 43rd International Conference on the Biology of the Myxobacteria (2015)
3. Bahar F, Pratt-Szeliga P, Welch RD. (2015). "Quantifying *M. xanthus* Developmental Dynamics" Bacterial Locomotion and Signal Transduction Meeting, Tucson, AZ.
4. Bahar F, Pratt-Szeliga P, Pierson T, Welch RD. (2014). "Phenotype Fingerprinting of *Myxococcus xanthus* Development" American Society for Microbiology General Meeting, Boston, MA.
5. Bradley M, Welsh J, and Welch RD. (2013). "Correlating Expression Profiles of Phenotypic Defects in *Myxococcus xanthus*". West Coast Bacterial Physiology Meeting, Asilomar, CA.

PATENTS

1. Shultz JW, Lewis MK, Leippe D, Mandrekar M, Kephart D, Rhodes RB, Andrews CA, Hartnett JR, Gu T, Olson RJ, Welch RD, 2001. Nucleic Acid Detection. Patent No. 6,312,902.
2. Shultz JW, Lewis MK, Leippe D, Mandrekar M, Andrews CA, Hartnett JR, Welch RD, 2001. Depolymerization method for nucleic acid detection of an amplified nucleic acid target. Patent No. 6,277,578.
3. Shultz JW, Lewis MK, Leippe D, Mandrekar M, Kephart D, Rhodes RB, Andrews CA, Hartnett JR, Gu T, Olson RJ, Wood KV, Welch RD, 2001. Exogenous nucleic acid detection. Patent No. 6,270,974.
4. Lewis MK, Kephart D, Rhodes RB, Shultz JW, Leippe D, Mandrekar M, Andrews CA, Hartnett JR, Gu T, Wood KV, Welch RD, 2001. Multiplex method for nucleic acid detection. Patent No. 6,270,973.
5. Shultz JW, Lewis MK, Mandrekar M, Leippe D, Smith RR, Welch RD, 2001. Analytical methods and materials for nucleic acid detection. Patent No. 6,268,146.
6. Shultz JW, Lewis MK, Leippe D, Mandrekar M, Kephart D, Rhodes RB, Andrews CA, Hartnett JR, Gu T, Olson RJ, Wood KV, Welch RD, 2001. Detection of nucleic acid hybrids. Patent No. 6,235,480.

TEACHING

PRIMARY COURSES

BIO422:Bioinformatics for Life Scientists: (2006 – present) (enrollment = ~20)

description: Bioinformatics laboratory with applications to biological research. Emphasis is placed on the hands-on use of current bioinformatics tools to solve relevant biological problems. Topics covered in 2015 include both theory and use of the basic local alignment search tool (BLAST), Gene Ontology (GO), the Kyoto Encyclopedia of Genes and Genomes (KEGG), Clusters of Orthologous Groups (both COG and eggNOG), and the CLC Genomics Workbench for both assembly and annotation. Emphasis is placed on understanding and applying these tools at both gene and genome scales.

BCM475: Biochemistry I: (2004 - present) (enrollment = ~200)

description: Biochemistry survey course. Topics covered in this course include: the chemistry of water and the amino acids; weak interatomic interactions; amino acids and peptides; primary, secondary, tertiary and quaternary structures of proteins; protein function: enzyme mechanisms, kinetics and regulation; the flow of genetic information; DNA structure, replication, repair, recombination; RNA synthesis and processing; protein synthesis and the genetic code; recombinant DNA technology.

CAS101: First Year Forum: (2004 - present) (enrollment = ~15)

description: An introduction to the University in small discussion sections that cover diverse topics. Relevant reading and writing with discussions including Syracuse University structure and function, developing written and verbal communication skills, establishing methods for effective learning and information retention, and interacting with Syracuse University services for undergraduate major and career development assistance.

SECONDARY COURSES

BIO4/600	Modern Concepts in Biology
BIO610	Graduate Research Laboratory
BIO688	Biological Literature
BIO4/690	Undergraduate/Graduate Independent Study
BIO4/660	Research in Biology
CAS470	Experience Credit
CIP470	ExpCr/Dental Services

MENTORSHIP

POSTDOCTORAL

Aaron Skewes	(2009 - 2013)	Current: Data Scientist / Statistical Analyst, Syracuse University
Kimberly A. Murphy	(2006 - 2007)	Current: Assistant Professor, Augustana College,

GRADUATE

Jessica Comstock	(PhD)	(2015 - present)	Current: Completing proof-of-concept experiments for primary project.
Devin Rivard-Neu	(MS)	(2013 - present)	Current: Completing data for primary author publication.
Michael Bradley	(PhD)	(2011 - present)	Current: Middle author on two publications and is preparing his first primary author publication.
Fatmagul Bahar	(PhD)	(2010 - present)	Current: Primary author on one publication and is preparing her second.

Philip Prat-Szeliga	(PhD)	(2009 - present)	Current: Primary author on two publications, middle author on one, and is completing his thesis.
Jinyuan Yan	(PhD)	(2007 - 2012)	Current: Postdoctoral Fellow, Sloan Kettering Medical Center, Laboratory of Joao Xavier.
Bradley Arshinoff	(MS)	(2005 - 2008)	Current: Ph.D. Student, University of Toronto
Balaji Srinivasan	(PhD)	(2003 - 2005)	Current: Partner at Andreessen Horowitz, CEO 21e6
Garret Suen	(PhD)	(2004 - 2008)	Current: Assistant Professor, University of Wisconsin - Madison.
Rion G. Taylor	(PhD)	(2004 - 2008)	Current: Associate Professor, Midwest Nazarene University.

UNDERGRADUATE

Marguerite Smith	(BS)	(2014 - present)	Current: received BS in Biology in 2015, completing data for a primary author publication, and applying to graduate school.
Abrar Aljiboury	(junior)	(2015 - present)	Current: Conducting research in laboratory over summer
Muzayyane Haq	(senior)	(2015 - present)	Current: Conducting research in laboratory over summer
Emmanuel Amendzro	(senior)	(2015)	Current: Completed undergraduate research over spring semester.
Huiwen Jiang	(senior)	(2015)	Current: Completed undergraduate research over spring semester.
Lindsay McCabe	(BS)	(2013)	Current: M.S. student, Syracuse University, Syracuse University Fit Families Program, Syracuse, NY.
Kimicia Isaac	(BS)	(2012 - 2014)	Current: Mathematics Instructor, Piney Woods School, Piney Woods, MS.
Dennis Frazer	(BS)	(2012 - 2013)	Current: Seeking Engineering Position
Corrine J. Mansfield	(BS)	(2007 - 2009)	Current: Senior Research Technician at Monell Chemical Senses Center
Stuart Angus	(BS)	(2006 - 2008)	Current: Research Associate at Genzyme Corporation, Department of Neuroscience
Sama Beg	(BS)	(2006 - 2008)	Current: Manager, The Green House Residences, Memory Care Assisted Living at Brooks Rehabilitation
Caroline Herndon	(BS)	(2005 - 2006)	Current: Contract Editor, American Journal Experts
Christina Chang	(BS)	(2004 - 2006)	Current: Technician, Weill Cornell Medical College
Tatiana Nikitas	(BS)	(2004 - 2005)	Current: Veterinarian, Down Maine Veterinary Clinic, Sanford, ME.

DISSERTATION COMMITTEES

Nora Carboroy	(Ph.D.)	(P.I. – Anthony Garza)	Nikhilesh Dhar	(Ph.D.)	(P.I. – Ramesh Raina)
Collin Fischer	(Ph.D.)	(P.I. – Philip Borer)	Grant Gephart	(Ph.D.)	(P.I. – Melissa Pepling)
Krista Giglio	(Ph.D.)	(P.I. – Anthony Garza)	Pallavi Gupta	(Ph.D.)	(P.I. – Ramesh Raina)
Sharon Mark	(M.S.)	(P.I. – Dacheng Ren)	Faisury Ossa	(Ph.D.)	(P.I. – Anthony Garza)
Farah Tengra	(Ph.D.)	(P.I. – Anthony Garza)			