

JASON A. PAPIN, Ph.D.

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POSITIONS

University of Virginia

Assistant Professor	2005-present
Department of Biomedical Engineering	
Faculty Member	2006-present
Robert M. Berne Cardiovascular Research Center	
Faculty Member	2006-present
Cancer Center	
Non-Resident Faculty Member	2008-present
Center for Public Health Genomics	

EDUCATION

University of California, San Diego	Winter 2005
<i>Doctorate of Philosophy</i> , Bioengineering	
Additional Specialization in Bioinformatics	
Principal Advisor: Bernhard Palsson, Ph.D.	
Co-advisor: Shankar Subramaniam, Ph.D.	
Thesis: Systems Analysis of Cellular Signaling Networks	
University of California, San Diego	Fall 2002
<i>Master of Science</i> , Bioengineering	
Advisor: Bernhard Palsson, Ph.D.	
University of California, San Diego	Spring 2000
<i>Bachelor of Science</i> , Bioengineering	
<i>Magna Cum Laude</i>	

HONORS & ACTIVITIES

- Associate Editor, PLoS Computational Biology (2008 – present)
- National Science Foundation CAREER award (2007-2012)
- Award for Excellence in Biomedical Engineering Undergraduate Education, U. Virginia (2007)
- Nominee from the University of Virginia for the Packard Fellowships for Science and Engineering (2006)
- American Society of Microbiology (ASM) member (2006 – present)
- Biomedical Engineering Society (BMES) member (2005 – present)
- American Institute of Chemical Engineers (AIChE) member (2005 – present)
- International Society for Computational Biology (ICSB) member (2005 – present)
- Whitaker Foundation Graduate Fellowship (2001 – 2004)
- Bioengineering Graduate Student Association, University of California, San Diego (2000-2004)
 - Graduate Studies Committee, Student Representative (2002-2003)
 - Publications Committee Co-Chair, Annual Research Symposium (2001-2002)
- National Science Foundation Graduate Research Fellowship Honorable Mention (2001)
- Award for Excellence as a Teaching Assistant (June 2001)

- *Magna Cum Laude*, University of California, San Diego (June 2000)
- Member of Phi Beta Kappa honor society (June 1999)
- Regents' Scholar, University of California, San Diego (1994-2000)
- Undergraduate Provost's Honor Roll, Every Quarter at University of California, San Diego (1994-2000)
- Eagle Scout (November 1991)

PEER-REVIEWED PUBLICATIONS

Indicates the corresponding author(s).

% These authors were students, technicians, or post-doctoral fellows under the supervision of J.A. Papin.

* Indicates equal contribution of authors.

Manichaikul, A.%, L. Ghamsari, E.F.Y. Hom, C. Lin, R.R. Murray, R.L. Chang, T. Hao, Y. Shen, A.K. Chavali%, I. Thiele, X. Yang, E. Mello, D.E. Hill, M. Vidal, K. Salehi-Ashtiani#, and J.A. Papin#. 2009. Metabolic network analysis integrated with transcript verification for sequenced genomes. *Nature Methods*. 6(8): 589-592.

Glass G.%, J.A. Papin, J.W. Mandell#. 2009. SIMPLE: A Sequential Immunoperoxidase Labeling and Erasing Method. *Journal of Histochemistry & Cytochemistry*. In press.

Roberts, S.B., J.L. Robichaux%, A.K. Chavali%, P.A. Manque, V. Lee, A.M. Lara, J.A. Papin#, and G.A. Buck#. 2009. Proteomic and network analysis characterize stage-specific metabolism in *Trypanosoma cruzi*. *BMC Systems Biology*. 3:53.

Gianchandani E.P. %, A.R. Joyce, B.O. Palsson, and J.A. Papin#. 2009. Functional states of the genome-scale *Escherichia coli* transcriptional regulatory system. *PLoS Computational Biology*. 5(6): e1000403. doi:10.1371/journal.pcbi.1000403.

Wieghaus, K.A.* , E.P. Gianchandani*%, R.A. Neal, M.A. Paige, M.L. Brown, J.A. Papin#, and E.A. Botchwey#. 2009. Phthalimide neovascular factor 1 (PNF1) modulates MT1-MMP activity in human microvascular endothelial cells. *Biotechnology and Bioengineering*. 103: 796-807.

Oberhardt M.A.%, A.K. Chavali%, and J.A. Papin#. 2009. Flux balance analysis: interrogating genome-scale metabolic networks. *Methods in Molecular Biology*. 500:61-80.

Mandell, J.W. #, C.N. Locke%, G. Glass%, E.P. Gianchandani%, T.D. Bourne, D. Schiff, S. Amos, and J.A. Papin. 2009. Dephosphorylation of β -arrestin 1 in high grade gliomas. *Journal of Neuropathology and Experimental Neurology*. 68(5):535-541.

Puchalka, J. *, M.A. Oberhardt*%, M. Godinho, A. Bielecka, D. Regenhardt, K. Timmis, J.A. Papin#, and V.M. dos Santos#. 2008. Genome-scale reconstruction and analysis of the *Pseudomonas putida* KT2440 metabolic network facilitates applications in biotechnology. *PLoS Computational Biology*, 4: e1000210.

Chavali, A.K. *%, E.P. Gianchandani*%, K.S. Tung, M.B. Lawrence, S.M. Peirce-Cottler, and J.A. Papin#. 2008. Characterizing emergent properties of immunological systems with multi-cellular rule-based computational modeling. *Trends in Immunology*, 29: 589-599. **Cover Illustration.**

Wieghaus, K.A. *, E.P. Gianchandani*, M.A. Paige, M.L. Brown, E.A. Botchwey, and J.A. Papin#. 2008. Novel pathway compendium analysis elucidates mechanism of pro-angiogenic synthetic small molecule. *Bioinformatics*, 24(20): 2384-2390.

Lee, J.M. ^{**}, E.P. Gianchandani^{**}, J. Eddy[%], and J.A. Papin[#]. 2008. Characterizing signaling, metabolic, and regulatory networks with integrative dynamic flux balance analysis (idFBA). *PLoS Computational Biology*. 4(5): e1000086. doi:10.1371/journal.pcbi.1000086.

Chavali, A.K.[%], J. Eddy[%], J. Whittemore[%], K. Williams[%], and J.A. Papin[#]. 2008. Systems analysis of metabolism in the pathogenic trypanosomatid *Leishmania major*. *Nature/EMBO Molecular Systems Biology*. 4:177. **Featured in Medical News Today (May 17, 2008, <http://www.medicalnewstoday.com/articles/107830.php>) as well as other news outlets, including WVIR-TV (NBC) channel 29 on May 16, 2008. Featured in Genetic Engineering & Biotechnology News, May 1, 2009.**

Gianchandani, E.P. ^{**}, M.A. Oberhardt^{**}, A. P. Burgard, C.D. Maranas, and J.A. Papin[#]. 2008. Predicting biological system objectives de novo from internal state measurements. *BMC Bioinformatics*. 9:43.

Oberhardt, M.A. ^{**}, J. Puchalka^{*}, K. Fryer[%], V.M. dos Santos[#], and J.A. Papin[#]. 2008. Genome-scale metabolic network analysis of the opportunistic pathogen *Pseudomonas aeruginosa* PAO1. *Journal of Bacteriology*. 190(8):2790-803. **Cover Illustration. Featured in Medical News Today (May 17, 2008, <http://www.medicalnewstoday.com/articles/107830.php>) as well as other news outlets, including WVIR-TV (NBC) channel 29 on May 16, 2008. Featured in Genetic Engineering & Biotechnology News, May 1, 2009.**

Robertson, S.H. [%], C.K. Smith[%], A.L. Langhans[%], S.E. McLinden[%], M.A. Oberhardt[%], K.R. Jakab, B. Dzamba, D.W. DeSimone, J.A. Papin[#], and S.M. Peirce[#]. 2007. Multiscale computational analysis of *Xenopus laevis* morphogenesis reveals key insights of systems-level behavior. *BMC Systems Biology*. 1:46.

Wiegand, K.A., E.P. Gianchandani[%], M.L. Brown, J.A. Papin, and E.A. Botchwey[#]. 2007. Mechanistic Interrogation of Phthalimide Neovascular Factor 1 (PNF1) using Network Analysis Tools. *Tissue Engineering*. 13(10): 2561-2575. **Editor's Pick – Hot Paper on Tissue Engineering in October 2007.**

Gianchandani, E.P. ^{**}, J.A. Papin^{**}, N.D. Price, A.R. Joyce, and B.O. Palsson. 2006. Matrix formalism for transcriptional regulatory systems. *PLoS Computational Biology*, 2: 902-917. **Cover Illustration.**

Lee, J.M. [%], E.P. Gianchandani[%], and J.A. Papin[#]. 2006. Flux Balance Analysis in the Era of Metabolomics. *Briefings in Bioinformatics*. 7: 140-150.

Gianchandani, E.P. [%], D.L. Brautigan, and J.A. Papin[#]. 2006. Systems Analyses Characterize Integrated Functions of Biochemical Networks. *Trends in Biochemical Sciences*, 31: 284-291.

Peirce-Cottler, S.M., T.S. Skalak, and J.A. Papin. 2006. Multi-scale systems integration from cells to tissues: coupling intracellular network analysis with tissue-patterning simulations. *IBM Journal of Research and Development*, 50(6): 601-615.

Papin, J.A., T. Hunter, B.O. Palsson, and S. Subramaniam. 2005. Reconstruction of large-scale cellular signaling networks and analysis of their properties. *Nature Reviews Molecular Cell Biology*, 6: 99-111. **Cover Illustration. Highlighted by Nature Reviews in a special Systems Biology print and on-line collection in May 2005.**

Papin, J.A., J.L. Reed, and B.O. Palsson. 2004. Hierarchical thinking in network biology: the unbiased modularization of biochemical networks. *Trends in Biochemical Sciences*, 29: 641-647. **Cover Illustration.**

Papin, J.A., J. Stelling, N.D. Price, S. Klamt, S. Schuster, and B.O. Palsson. 2004. Comparison of network-based pathway analysis methods. *Trends in Biotechnology*, 22: 400-405.

- Papin, J.A., and B.O. Palsson. 2004. The JAK-STAT signaling network in the human B-cell: an extreme signaling pathway analysis. *Biophysical Journal*, 87: 37-46.
- Papin, J.A., and B.O. Palsson. 2004. Topological analysis of signaling networks: a scalable framework to obtain emergent properties including crosstalk. *Journal of Theoretical Biology*, 227: 283-297.
- Papin, J.A., and S. Subramaniam. 2004. Bioinformatics and cellular signaling. *Current Opinion in Biotechnology*, 15: 78-81.
- Price, N.D.*, J.L. Reed*, J.A. Papin*, S. J. Wiback, and B.O. Palsson. 2003. Network-based analysis of metabolic regulation in the human red blood cell. *Journal of Theoretical Biology*, 225: 1985-1994.
- Papin, J.A., N.D. Price, S.J. Wiback, D.A. Fell, and B.O. Palsson. 2003. Metabolic pathways in the post-genome era. *Trends in Biochemical Sciences*, 28: 250-258.
- Palsson, B.O., N.D. Price, and J.A. Papin. 2003. Development of network-based pathway definitions: the need to analyze real metabolic networks. Letter to the Editor, *Trends in Biotechnology*, 21: 195-198.
- Price, N.D., J.A. Papin, C.H. Schilling, and B.O. Palsson. 2003. Genome-scale microbial *in silico* models: the constraints-based approach. *Trends in Biotechnology*, 21: 162-169.
- Price, N.D.*, J.L. Reed*, J.A. Papin*, I. Famili, and B.O. Palsson. 2003. Analysis of metabolic capabilities using singular value decomposition of extreme pathway matrices. *Biophysical Journal*, 84: 794-804.
- Papin, J.A.*, N.D. Price*, and B.O. Palsson. 2002. Extreme pathway lengths and reaction participation in genome-scale metabolic networks. *Genome Research*, 12: 1889-1900.
- Price, N.D.*, J.A. Papin*, and B.O. Palsson. 2002. Determination of redundancy and systems properties of *Helicobacter pylori*'s metabolic network using genome-scale extreme pathway analysis. *Genome Research*, 12: 760-769. **Highlighted by Current Opinions in Microbiology as one of six articles of "special interest" in genomics for May-June 2002.**
- Papin, J.A.*, N.D. Price*, J.S. Edwards, and B.O. Palsson. 2002. The genome-scale metabolic extreme pathway structure in *Haemophilus influenzae* shows significant network redundancy. *Journal of Theoretical Biology*, 215: 67-82.

BOOK CHAPTERS

- Papin, J.A. #, E.P. Gianchandani%, and S. Subramaniam#. 2006. Mapping the genotype-phenotype relationship in cellular signaling networks: building bridges over the unknown, in: *Systems Biology*, eds. Isidore Rigoutsos and Gregory Stephanopoulos. Oxford University Press.
- Papin, J.A., N.D. Price, and B.O. Palsson. 2004. *In silico* cells: studying genotype-phenotype relationships using constraints-based models, in: *Metabolic Engineering in the Post-Genomic Era*, eds. Hans Westerhoff and Boris Kholodenko.

CONFERENCE PROCEEDINGS (REFEREED)

Allen, T.E.#, Saucerman, J.J., Papin, J.A., and Peirce, S.M. 2009. Development and assessment of a novel systems bioengineering course integrating modeling and experimentation, *Proceedings for the 2009 ASEE Annual Conference and Exposition*.

PUBLICATIONS (NON-REFEREED)

Papin, J.A. 2006. Review of “Robust Design: A Repertoire of Biological, Ecological, and Engineering Case Studies”, ed. Erica Jen, in *The Quarterly Review of Biology*, 81(3):168

ORGANIZER – CONFERENCE/SYMPOSIA

IEEE-EMBC Annual Meeting, Session Organizer for “Metabolic and Regulatory Networks”, September 2009, Minneapolis, Minnesota

International Conference of Biomedical Engineering, Eli Lilly-sponsored session on Systems Bioengineering, December 2008, Singapore

Biomedical Engineering Society, Annual Meeting, St. Louis, MO, October 2008.

Co-chair of track “Systems Biology and Bioinformatics” comprised of approximately 8 sessions. Solicited participation of session chairs and topics. Organized talks for sessions.

Biomedical Engineering Society, Annual Meeting, Los Angeles, CA, September 2007.

Co-organizer of session entitled, “Regulation and Pathophysiology of Metabolic Networks” in the Systems Biology and Bioinformatics Track

Co-organizer of session entitled, “Systems Biology” in the New Frontiers and Special Topics Track

Biomedical Engineering Society, Annual Meeting, Chicago, IL, October 2006.

Co-organizer of session entitled, “Large-scale systems: optimization, estimation, and sensitivity analysis”

UVA Biotechnology Training Grant Bi-Annual Symposium, Charlottesville, VA, April 2006.

Organizing committee for symposium entitled, “Systems Biology: Linking Molecules in Networks to Cells in Tissues”

INFORMS Optimization Society Conference, San Antonio, TX, February 2006.

Organizer of session entitled, “Network Analysis of Biological Systems”

SERVICE ACTIVITIES

Grant Reviewer

National Institutes of Health, Challenge Grant Reviewer (July 2009)

National Science Foundation BME review panel (May 2009)

National Science Foundation BME review panel (December 2008)

Department of Defense (October 2008)

Department of Energy (September 2008)

National Science Foundation BME review panel (April 2008)

Canadian National Science & Engineering Research Council (2008)

National Science Foundation BME review panel (December 2007)

National Institutes of Health, National Science Foundation review panel (April 2007, special panel on Mathematical Biology)

North Carolina Biotechnology Center (2006)

Jeffress Memorial Trust (2006, 2008)

Faculty Advisor

Virginia Genetically Engineered Machines (VGEM) 2007, 2008, 2009 teams
Team of undergraduate students competing in the iGEM competition in Boston, MA.

Graduate Student Committees

Kevin D'Auria – Ph.D. BME, U. Virginia (advisor)
Paul Jensen – Ph.D. BME, U. Virginia (advisor)
Matthew Oberhardt – Ph.D. BME, U. Virginia (advisor)
Arvind Chavali – Ph.D. BME, U. Virginia (advisor)

Erwin Gianchandani – Ph.D. BME, U. Virginia (advisor) (graduated 2009)
Corinne Locke – M.S. Mol. Physiology & Biophysics, U. Virginia (advisor) (graduated 2008)

Kristina Little – Ph.D. BME, U. Virginia (committee chair)
Annika Hedin – Ph.D. BME, U. Virginia (committee chair)
Robert Amanfu – Ph.D. BME, U. Virginia (committee chair)

Jason Yang – Ph.D. BME, U. Virginia
Lydia Glaw – Ph.D. BME, U. Virginia
Michael Ellis – Ph.D. BME, U. Virginia

Alex Bailey – Ph.D. BME, U. Virginia (committee chair) (graduated 2008)
Brian Schmidt – Ph.D. BME, U. Virginia (graduated 2009)
Drake Guenther – Ph.D. BME, U. Virginia (graduated 2008)
Kristen Wieghaus – Ph.D. BME, U. Virginia (graduated 2008)
Greg Riddick – Ph.D. Biochemistry, U. Virginia (graduated 2007)
Edward Stites – Ph.D. Biochemistry, U. Virginia (graduated 2007)

Tomorrow's Professor Today Mentor

Lauren Sefcik, BME, U. Virginia (2007-2008)
Erin Reed, MAE, U. Virginia (2007-2008)

Journal Reviewer

Annals of Biomedical Engineering
Applied Bioinformatics
Applied and Environmental Microbiology
Bioinformatics
Biophysical Journal
BioSilico
BioSystems
Biotechnology & Bioengineering
BMC Bioinformatics
BMC Microbiology
BMC Systems Biology
Briefings in Bioinformatics
Bulletin of Mathematical Biology
Cell
Genome Research

IET Systems Biology
 Journal of Bacteriology
 Journal of Theoretical Biology
 Nature/EMBO Molecular Systems Biology
 Nature Biotechnology
 PLoS Computational Biology

- U. Virginia, School of Medicine*, Research Retreat Program Committee (9/08 – 2/09)
 Committee Member
 Developed tracks and sessions for School of Medicine-wide research retreat
- U. Virginia, School of Engineering and Applied Sciences*, Award Committee (4/08, 4/09)
 Committee Member
 Evaluated undergraduate SEAS student applications for scholarships.
- U. Virginia, School of Engineering and Applied Sciences*, Web Committee (5/07 – 6/08)
 Committee Member
 Evaluated SEAS web strategy and developed plans to increase effectiveness of SEAS web presence
- U. Virginia, Department of Biomedical Engineering*, Impact Committee (5/07 – present)
 Committee Member
 Developed strategic initiatives to optimize impact of departmental research and education missions
- U. Virginia, Department of Biochemistry & Molecular Genetics, Computational Genomics Center*, Faculty Search Committee (9/06 – 3/07)
 Committee Member
 Reviewed applications for two faculty positions and participated in committee discussions over candidates
- U. Virginia, Department of Biomedical Engineering*, Seminar Series Committee (5/06 – present)
 Committee Chair
 Organized departmental seminar series (extended invitations, organized annual schedules, organized detailed visit itineraries)
- U. Virginia, School of Eng. App. Sci., Common Reading Experience*
 Organizing committee, Group leader (*America 1908*, by Jim Rasenberger) (2/2008 – 8/2008)
 Organizing committee, Group leader (*Endurance*, by Ernest Shackleton) (2/2007 – 8/2007)
 Organizing committee, Group leader (*Brave New World*, by Aldous Huxley) (2/2006 – 8/2006)
 Group leader (*Rocket Boys*, by Homer Hickman) (8/2005)

TEACHING

- Systems Bioengineering: Modeling and Experimentation* – BIOM 495 (Instructor with Timothy Allen, Shayn Peirce-Cottler, Jeff Saucerman) – funded by NSF CCLI grant (1/2008-12/2010)
 University of Virginia, Department of Biomedical Engineering
 Fall Semester 2008 (8/08 – 12/08) – 9 students
 Topics: Intracellular and multicellular modeling; signaling dynamics; FRET; RNA isolation; gene expression microarrays
- Computational Systems Biology: Multi-scale Models in Biology* – BIOM 896 (Instructor with Shayn Peirce-Cottler)
 University of Virginia, Department of Biomedical Engineering
 Spring Semester 2006 (1/06 – 5/06) – 14 students

Spring Semester 2008 (1/08 – 5/08) – 13 students

Topics: Multi-scale biology, genome bioinformatics, genome-scale network analysis, tissue-level simulations, whole-organ modeling, model-building process

Computational Biomedical Engineering – BIOM 315 (Instructor)

University of Virginia, Department of Biomedical Engineering

Spring Semester 2005 (1/05 – 5/05) – 51 students

Spring Semester 2006 (1/06 – 5/06) – 77 students

Spring Semester 2007 (1/07 – 5/07) – 67 students

Spring Semester 2008 (1/08 – 5/08) – 65 students

Spring Semester 2009 (1/09 – 5/09) – 62 students

Topics: Model construction & evaluation; Systems of Equations; PDEs; ODEs; Numerical Integration & Differentiation; Curve Fitting

Systems Biology & Bioengineering Short Course (Co-instructor)

Inha University, Incheon, South Korea

September 2004

Topics: Biochemical network reconstruction, Systems analysis techniques
Bernhard Palsson was the principal instructor.

Systems Biology & Bioengineering Short Course (Co-instructor)

University of California, San Diego

May 2004

Topics: Biochemical network reconstruction, Systems analysis techniques
Bernhard Palsson was the principal instructor.

TRAINING

Post-Doctoral Fellows

Ani Manichaikul (1/08 – present)

Project: Validation of genome annotation through network reconstruction and analysis of *Chamydomonas reinhardtii* metabolism with hydrogen production applications .

Current Status: In lab

Jong-Min Lee (7/05 – 7/06)

Project: Genome-scale dynamic analysis of cellular signaling.

Current Status: Assistant Professor in Chemical and Materials Engineering at University of Alberta in Edmonton, Alberta, Canada

Graduate Students

Paul Jensen (8/08 – present)

Project: Systems analysis of infectious disease.

Current Status: In lab

Arvind Chavali (8/06 – present)

Project: Reconstruction of intracellular metabolic network of *Leishmania major* and immune response.

Current Status: In lab

Matthew Oberhardt (11/05 – present)

Project: Analysis of metabolic networks in opportunistic pathogen *Pseudomonas aeruginosa*.
Current Status: In lab

Corinne Locke (11/05 – 12/07)
Graduated with M.S. in Molecular Physiology & Biophysics, 2008
Project: Reconstruction and analysis of signaling networks in gliomas.
Current Status: Finishing medical school.

Erwin Gianchandani (1/05 – 3/09)
Project: Integration of cellular signaling, regulatory, and metabolic networks in *Saccharomyces cerevisiae*; systems analysis of signaling networks in human cancer.
Current Status: Founding director of BMEplanet, AAAS Science Policy Fellow

Research Technicians

George Glass (5/07 – 8/08, 6/09 – 8/09)
Project: Analysis of human brain cancer proteome.
Current Status: Medical student at University of Virginia

Michael Saravo (5/07 – present)
Project: Analysis of human brain cancer proteome. IT support.
Current Status: In lab

Visiting Students

Sandra Gagnon (9/08 – 12/08)
Institution: Universite Laval, Quebec City, Quebec, Canada
Project: *Leishmania* metabolism, drug targeting.
Current Status: Graduate student at Universite Laval

Andres Pinzon (2/09 – 8/09)
Institution: Los Andes University, Bogota, Columbia
Project: Pathogen-host regulatory networks.
Current Status: Graduate student at Los Andes University

Undergraduate Students

Shokoufeh Dianat (8/08 – 5/09)
Graduated, BS, Biomedical Engineering
Project: Translation efficiency of influenza viral genome in human epithelial cell. (Awarded 1st place in School-wide Undergraduate Research and Design Symposium 2009)
Current Status: Applying to medical school.

Jenna Zhang (8/08 – 5/09)
Graduated, BS, Biomedical Engineering
Project: Translation efficiency of influenza viral genome in human epithelial cell. (Awarded 1st place in School-wide Undergraduate Research and Design Symposium 2009)
Current Status: Employed.

Lindsey Taylor (1/08 – 5/09)
Graduated, BS, Biomedical Engineering
Project: Reconstruction of regulatory network of *Pseudomonas aeruginosa*.

Current Status: 1 ½ year mission in Toulouse, France.

Alicia Midland (8/07 – 8/08)

Graduated, BS, Biomedical Engineering

Project: Analysis of synonymous mutations in influenza genomes.

Current Status: PhD student in Biomedical Engineering at University of North Carolina

Jennifer Robichaux (1/07 – 5/08)

Graduated, BS, Biomedical Engineering

Project: Reconstruction of metabolic network of *Trypanosoma cruzi*

Current Status: PhD student in Biomedical Engineering at Tulane University

James Eddy (8/06 – 8/07)

Graduated, BS, Biomedical Engineering

Project: Reconstruction of metabolic network of *Leishmania major*

Current Status: PhD student in Bioengineering at University of Illinois

Kyle Williams (8/06 – 5/07)

Graduated, BS, Biomedical Engineering

Project: Reconstruction of metabolic network of *Leishmania major*

Current Status: Employed at CGI Federal Health Care.

Kimberly Fryer (8/06 – 10/07)

Project: Reconstruction of metabolic network of *Pseudomonas aeruginosa*

Current Status: Medical School student at University of Virginia

Arvind Chavali (9/05 – 5/06)

Graduated, BS, Biomedical Engineering, Neuroscience

Project: Reconstruction of intracellular metabolic network of *Leishmania major*

Current Status: Ph.D. student in BME at U. Virginia

Brandon Babcock (5/05 – 8/05)

Graduated, BS, Biomedical Engineering

Project: Reconstruction of signaling network in *Xenopus laevis*

Current Status: Medical school

Jeffrey Whittemore (1/05 – 5/07)

Graduated, BS, Biomedical Engineering

Project: Model of within-host dynamics of *Leishmania major*; reconstruct intracellular metabolic network of *L. major*

Current Status: Employed at Elder Research (<http://www.datamininglab.com/>)

SEMINARS/PRESENTATIONS

Papin, J.A. Stanford University School of Medicine, Department of Microbiology & Immunology, January 2010.

Papin, J.A. “Integrative analysis of metabolic and transcriptional regulatory networks for human pathogens,” Network Biology: Understanding metabolic and protein interactions, Mathematical Biosciences Institute, Ohio State University, September 2009, Columbus, Ohio.

Papin, J.A., P. Jensen. "Integrative analysis of metabolic and regulatory networks," IEEE-EMBC Annual Conference, September 2009, Minneapolis, Minnesota.

Papin, J.A. "Characterizing mechanisms of pathogenicity in *Pseudomonas aeruginosa* with systems biology approaches," Pseudomonas conference, August 2009, Hannover, Germany.

Papin, J.A. "Systems analysis of human pathogens," Symposium on Multi-Scale Modeling of Host/Pathogen Interactions, University of Pittsburgh, June 2009, Pittsburgh, Pennsylvania.

Papin, J.A. "Systems analysis of human pathogens," Department of Chemical & Biological Engineering, University of Wisconsin, March 2009, Madison, Wisconsin.

Papin, J.A. and Salehi-Ashtiani, K. "Metabolic network analysis integrated with transcript verification for improved genome annotation," Genomes to Life Conference, Department of Energy, February 2009, Bethesda Maryland.

Papin, J.A. "Systems analysis of infectious disease," International Conference of Biomedical Engineering, Eli Lilly-sponsored session on Systems Bioengineering, December 2008, Singapore.

Papin, J.A. "Computational analysis of microbial networks," Department of Microbiology Seminar Series, Brigham Young University, November 2008, Provo, Utah.

Papin, J.A. "Quantitative systems biology: new methods and applications," Department of Chemical Engineering Seminar Series, University of Virginia, October 2008, Charlottesville, Virginia.

Papin, J.A. "Systems biology of infectious disease," INFORMS Optimization Society Annual Conference, October 2008, Washington, D.C.

Papin, J.A. "Systems biology of infectious disease," Network Biology, Cold Spring Harbor/Wellcome Trust Conference, August 2008, Hinxton, United Kingdom.

Papin, J.A. "Systems biology of infectious disease," Society for Mathematical Biology Conference, July 2008, Toronto, Canada.

Papin, J.A. "Systems biology of infectious disease," Quantitative System Biology 2008 workshop, Chinese Academy of Sciences – German Max Plank Society, Partner Institute for Computational Biology, July 2008, Shanghai, China.

Papin, J.A. "Systems biology of infectious disease," Division of Infectious Disease Seminar, Universite Laval, July 2008, Quebec City, Quebec, Canada.

Papin, J.A. "Systems biology of infectious disease," HHMI Summer Scholars Program in Systems Biology, Virginia Commonwealth University, June 2008, Richmond, Virginia.

Papin, J.A. "Large-scale cellular signaling networks and human disease," Department of Biochemistry Seminar Series, University of Virginia, December 2007, Charlottesville, Virginia.

Papin, J.A. "Analysis of biochemical networks," Seminar on Applications of Mathematics, University of Virginia, October 2007, Charlottesville, Virginia.

Papin, J.A. "Interrogating pathogen-host interactions with genome-scale network analysis," Annual Biomedical Engineering Society (BMES) Meeting, September 2007, Los Angeles, CA.

Papin, J.A. "Interrogating genome-scale reconstructions of integrated signaling, regulatory, and metabolic networks," Biophysical Journal Club, George Washington University Physics Department, March 2007, Washington, D.C. Invited

Papin, J.A. "Integrated Cellular Networks: Reconstruction and Analysis," Center for Cancer Systems Biology, Dana-Farber Cancer Institute, Harvard Medical School, January 2007, Cambridge, Massachusetts.

Papin, J.A. "Integrating high-throughput data into genome-scale network models," Cambridge Healthtech Institute, Identifying and Validating Metabolic Markers for Drug Development and Clinical Studies, December 2006, Orlando, Florida.

Papin, J.A. "Functional states of transcriptional regulatory systems," Annual Biomedical Engineering Society (BMES) Meeting, October 2006, Chicago, Illinois.

Papin, J.A., presented by graduate student Erwin P. Gianchandani. "Interrogating cellular signaling systems from intracellular networks to multicellular functions," International Conference of Computational Methods in Sciences and Engineering, October 2006, Crete, Greece.

Papin, J.A. "Integrating high-throughput data into genome-scale network models," Virginia Bioinformatics Institute Seminar Series, Virginia Polytechnic Institute and State University, October 2006, Blacksburg, Virginia.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Molecular Physiology and Biophysics Seminar Series, University of Virginia, October 2006, Charlottesville, Virginia.

Papin, J.A. "JAK-STAT signaling network in the human B-cell," Cell Signaling Systems Biology, September 2006, Rostock, Germany.

Papin, J.A. "Quantitative analysis of network-based, biochemical pathways," National Center for Biotechnology Information, Computational Biology Branch, November 2005, Bethesda, Maryland.

Papin, J.A. "Intracellular signaling networks: reconstruction and analysis," Fifth Virtual Conference on Genomics and Bioinformatics, October 2005, Arlington, Virginia.

Papin, J.A. "Intracellular signaling networks: reconstruction and analysis," Universitas 21 Systems Biology Network Meeting, July 2005, Nottingham, United Kingdom.

Papin, J.A. "From intracellular signaling networks to multicellular function," 7th BioPathways Consortium Meeting & Workshop on Practical Applications of Biosimulation (SIGSIM2005), Satellite Conferences to The 13th International Conference on Intelligent Systems for Molecular Biology (ISMB), June 2005, Detroit, Michigan.

Papin, J.A. "From intracellular signaling networks to multicellular function," Biological Networks: Interaction with Genome and Developmental Evolution, May 2005, Bertinoro, Italy.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Biomedical Engineering, The Johns Hopkins University, August 2004, Baltimore, Maryland.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Chemical and Biomolecular Engineering, Georgia Institute of Technology, July 2004, Atlanta, Georgia.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Biomedical Engineering, University of Virginia, July 2004, Charlottesville, Virginia.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Bioengineering, University of Washington, June 2004, Seattle, Washington.

Papin, J.A. "Systems analysis of cellular signaling networks," Department of Biomedical Engineering, University of Texas, May 2004, Austin, Texas.

RESEARCH & WORK EXPERIENCE

Computational Systems Biology Laboratory (January 2005 – Present)

- *Principal Investigator*
- Large-scale signaling networks and cell-cell communication systems.
- Interactions in microbial communities.

Systems Biology Research Group (December 2000 – December 2004)

- *Thesis: Systems Analysis of Cellular Signaling Networks*
- *Advisor:* Bernhard Palsson, Ph.D.
- Created and analyzed computational models of biological signal transduction networks.
- Established framework for modeling large-scale signal transduction networks.
- Computational pathway analysis of the metabolic networks of *Haemophilus influenzae* and *Helicobacter pylori*.

Vascular Bioengineering Laboratory (June 2000 – September 2000)

- *Research Project – UCSD Bioengineering Department*
- *Advisor:* Shu Chien, M.D., Ph.D.
- Investigated effects of uniaxial strain on vascular smooth muscle cells.
- Used cell culturing techniques, Western blots, and protein kinase assays.

VIA Medical Corporation (June 1999 – September 1999)

- *Junior Engineer*
- *Advisor:* Jim Macemon
- Developed new calibration scheme for blood gas chemistry monitor in consideration of foreign market issues.
- Improved temperature control algorithm.

Tissue Engineering and Cellular Fates Group (April 1999 – June 1999)

- *Research Project - UCSD Bioengineering Department*
- *Advisors:* Bernhard Palsson, Ph.D., Karl Francis
- Investigated potential fluorescent dyes for use in studies involving hematopoietic stem cells.
- Used fluorescence microscopy and cell staining techniques.

VIA Medical Corporation (June 1998 – September 1998)

- *Intern*
- *Advisor:* Jim Macemon
- Aided in the development of a PID algorithm for temperature control of a blood gas chemistry monitor.
- Assisted in software testing; circuit soldering and testing.