

Steven M. Thompson: Curriculum Vitae

DBA BioInfo 4U

Internet: stevet@bio.fsu.edu and <http://www.bioinfo4u.net>

2538 Winnwood Circle, Valdosta, GA, 31601-7953, 229-249-9751

Personal: 6'4", 230 lbs. Birth date: 1-18-1956

Spouse, since 12-21-1985: Theresa M. Thompson, Ph.D.

Objective

Primary professional ambition: Contribute to the understanding of fundamental questions in molecular biology — evolution, structure/function, development, and regulation — with computer-aided genomics and sequence analysis tools, and make these powerful bioinformatics resources available to the scientific community through cooperative collaboration, instruction, and writing and editorial assistance, with curricular implementation at all levels of higher education.

Experience

Independent Bioinformatics Consultant, Instructor, Author and Editor — BioInfo 4U: Current client, Edanz Group Global Ltd., freelance scientific editing (hired October 2103). Previous clients have included Florida State University, Tallahassee, FL, College of Medicine, Institute of Molecular Biophysics, and Department of Chemistry and Biochemistry (April 1999–September 2010); University of Florida, Gainesville, FL, Interdisciplinary Center for Biotechnology Research (April 1999–June 2000); and the Genetics Computer Group, Madison, WI (January 2000–March 2000). Services include scientific writing and editing, research consultation/collaboration, data-mining, bioinformatics computational analyses, and the design and implementation of sequence analysis workshops, particularly those emphasizing molecular evolution.

Instructor: South Georgia College Entry Program, Valdosta, GA (January 2012–May 2012). Taught non-major, undergraduate students first semester and second semester introductory general biology, and environmental science.

Instructor: Valdosta State University, Department of Biology, Valdosta, GA (August 2009–May 2011). Taught non-major, undergraduate students first and second semester introductory general biology, and a graduate-level molecular phylogenetics course (Spring 2010).

Course Faculty Member/Laboratory Instructor: The Workshop on Molecular Evolution, at the Marine Biological Laboratory, Woods Hole, MA (1992–2009, each late July / early August); and at the Centers for Disease Control and Prevention, Atlanta, GA (February 2008). Responsibilities included lecture, instruction, and assistance in the computer laboratory portion of the course, particularly that related to multiple sequence alignment and analysis. Students were graduate candidates, post-doctoral fellows, and university faculty members from worldwide, diverse scientific backgrounds. Computational techniques taught included GCG's SeqLab, SeaView, MAFFT, T-Coffee, PAUP*, PHYLIP, PAML, and MrBayes.

Assistant in Research: The Department of Scientific Computing, Florida State University, Tallahassee, FL (non-tenure track faculty August 2001–April 2009, visiting scientist September 2000–May 2001). Provided bioinformatics support — research collaboration; curriculum development, instruction, and coordination (workshops, modules, and two different courses: An Introduction to Bioinformatics and Comparative Genomics); and maintenance and management of bioinformatics software and databases.

US CRDF Peer Reviewer: U.S. Civilian Research & Development Foundation Cooperative Grants Program competition (2005). Member of grant proposal review committee.

Staff Scientist, Consultant, and Instructor: Center for Visualization, Analysis, and Design in the Molecular Sciences, Washington State University, Pullman, WA (August 1990–May 1998). Responsibilities included user assistance, consultation, and collaboration; software evaluation and installation; facilities maintenance; resource administration; technical writing; public relations; formal and informal instruction; and curriculum development, particularly of self-paced tutorials.

Section Co-Chair: Pacific Symposium on Biocomputing — Education Sessions (January, 1996 & 1997). Responsibilities included organization, participant correspondence, and direction of symposium subsection concerned with the methodology, pedagogy, and curricula for teaching bioinformatics and computational biology in higher education.

USDA NRICGP Peer Reviewer: Mechanisms of Animal Disease Program (1993) and Sustaining Animal Health and Well-Being Program (1997 & 1998). Member of ad hoc grant proposal review committee.

Project Associate: Biochemistry/Biophysics Department, Washington State University, Pullman, WA (September 1988–August 1990). Responsibilities included independent site-directed mutagenesis research on isocitrate lyase, general laboratory management and maintenance, radiation safety and control.

Graduate Assistant: Department of Biological Sciences, Northern Arizona University, Flagstaff, AZ (September 1983–May 1985). Responsibilities included set up and teaching of undergraduate laboratory courses: Cellular & Molecular Biology, Medical Anatomy & Physiology, General Genetics, General Biology, and Microbiology.

Classes, workshops, seminars, and course modules designed and taught

Most courses and lectures are available through my online CV in their entirety.

South Georgia College Entry Program, Valdosta, GA: Taught three undergraduate courses — “Introductory Biology I,” “Introductory Biology II,” and “Environmental Science” (Spring semester 2012).

Valdosta State University, Valdosta, GA: Taught undergraduate, non-major biology in two different courses, and one laboratory course — “Introduction to Biology: The Evolution and Diversity of Life,” “Introduction to Biology: Organismal Biology,” and “Organismal Biology Lab” (Fall semester 2009–Spring semester 2011). Developed and taught a graduate student molecular phylogenetics course — “Special Topics in Cell/Molecular Biology: Molecular Phylogenetics” (Spring semester 2010).

Also developed and delivered an overview human, medical bioinformatics summary, “Bioinformatics for the Naive Novice,” for the Continuing Education Learning In Retirement program (September 2010). And delivered a lecture, “My View of Life,” on deep evolution and the diversity of life for a multidisciplinary English Department course entitled “Global Images of Nature” (May, 2005 & 2008); and delivered an overview survey seminar on bioinformatics for a mixed, diverse audience, “A Post-Genomics Bioinformatics Survey . . . a whirlwind tour” (October 2002).

Florida State University, Tallahassee, FL: Developed, coordinated, and team-taught the graduate level “An Introduction to Bioinformatics” course (Spring semester 2002–Spring semester 2009), and helped to develop and team-teach the undergraduate “Experimental Biology: Comparative Genomics” course (Fall semester 2004–Spring semester 2007).

Also developed and delivered several introductory bioinformatics modules for various graduate courses — Biochemistry: Molecular Biology and Biotechnology (March, 2007, 2008 & 2009); Biomedical Sciences: Bioregulation (April 2008); Biochemistry: Molecular Biology (February, 2001, 2002 & 2005); Library and Information Studies: Information Representation (March, 2001 & 2002) — as well as a workshop for the Biology Department, “Command-line Phylogenetics — Computing Basics” (October 2005); a presentation for the undergraduate Howard Hughes Medical Institute Fellowship recipients (June 2003); and a presentation for the Mathematics Department colloquium series (March 2001).

Florida State University, Tallahassee, FL (1999–2007) and the **University of Florida**, Gainesville, FL (1999 & 2000): Developed and taught multi-hour, stand-alone, sequence analysis workshops that were taught multiple times per semester: 1) “A Brief Introduction to Multiple Sequence Analysis through GCG’s SeqLab,” with its appendices “The Genetics Computer Group” and “A Basic Guide to UNIX for Neophytes,” which covered basic bioinformatics with a particular emphasis on multiple sequence alignment techniques using GCG’s SeqLab system. 2) “Computational Methods for Rational Primer Design and Analysis,” which contained two scenarios, HPV L1 DNA strain specificity design, and primate prion protein guessmer design methods. 3) “Advanced DataBase Searching Techniques and PairWise Comparisons.” This workshop covered the algorithms and methodology of database searching and alignment significance. 4) “A Brief Introduction to Molecular Evolutionary Phylogenetic Inference.” This final workshop covered the rationale, methodology, and interpretation of molecular phylogenetic inference software.

Marine Biological Laboratory, Woods Hole, MA: Twice developed and delivered a presentation and tutorial (August, 2008 & 2009) for the **Workshop on Molecular Evolution** presenting multiple sequence alignment theory and technique using Kazutaka Katoh’s alignment program MAFFT within Manolo Gouy’s SeaView graphical multiple sequence alignment editor; and previously developed and taught (August, 1993–2007) “A Brief Introduction to Multiple Sequence Analysis through GCG’s SeqLab” and its supplement, “Bioinformatics — A SeqLab Introduction,” which provided a general introduction to basic bioinformatics sequence analysis, particularly multiple sequence alignment techniques using GCG’s SeqLab.

Also developed and delivered “Gene Discovery and Analysis in Contig3000, a 5.4Kb Stretch of the *Giardia lamblia* Genome” (July 1999), which was a four day long workshop for the **Josephine Bay Paul Center in Comparative Molecular Biology and Evolution** using GCG’s SeqLab for genome analysis, multiple sequence alignment, and feature annotation.

Centers for Disease Control and Prevention, Atlanta, GA: Developed and presented a survey lecture and tutorial for the “Workshop on Molecular Evolution, Special Session on Phylogenetics” on multiple sequence alignment techniques using Manolo Gouy’s graphical alignment editor SeaView along with Kazutaka Katoh’s alignment program MAFFT (February, 2008).

Fort Valley State University, Fort Valley, GA: Developed and taught a two day bioinformatics workshop emphasizing efficient use of the GCG SeqLab graphical user interface for sequence analysis (July, 2008).

NSF Chautauqua Course, Evolutionary Bioinformatics Education, sponsored by BioQUEST, hosted by Clark Atlanta University, Atlanta, GA: Presented and discussed methods and issues for multiple sequence alignment and analysis (May, 2003).

North Georgia College and State University, Dahlonega, GA: Delivered seminar on setting up an undergraduate bioinformatics curriculum (May, 2003).

Woods Hole Oceanographic Institution, Woods Hole, MA: Developed and presented “Biomolecular Sequence Alignment and Analysis, Part I — Bioinformatics: A SeqLab Introduction” and “Part II — A GCG Wisconsin Package SeqLab Tutorial for the Woods Hole Oceanographic Institution.” This was a two day long workshop consisting of an introductory lecture and a detailed tutorial for staff and faculty introducing the basics of sequence analysis and multiple sequence alignment using GCG’s SeqLab (February 2003).

Iowa State University, Bioinformatics and Computational Biology Program and the Laurence H. Baker Center for Bioinformatics and Biological Statistics, Ames, IA: Developed and presented “Biomolecular Sequence Alignment and Analysis, Part I — Bioinformatics: A SeqLab Introduction,” and “Part II — A GCG Wisconsin Package SeqLab Tutorial for Iowa State University.” This was a three day long workshop consisting of an introductory lecture and a detailed tutorial for graduate students, staff, and faculty introducing the basics of sequence analysis and multiple sequence alignment using GCG’s SeqLab (November, 2001 & 2002).

Washington State University, Pullman, WA: Helped to develop and team teach two Biochemistry/Biophysics Department courses, both entitled “Molecular Biology Computer Techniques” — one, an undergraduate, introductory-level survey course; and the other an intensive, graduate-level, project-oriented version — both included lectures and computer tutorials on bioinformatics and sequence analysis covering UNIX and MacOS, database access, PCR primer design, fragment assembly, gene discovery, dynamic programming, dot matrices, similarity search algorithms, multiple sequence alignment, structure prediction, molecular evolutionary phylogenetics, and in the graduate course, a

mock-professional meeting poster session final examination (undergraduate course Fall semester, 1996 & 1997; graduate course Spring semester, 1990–1998).

Also designed and delivered an afternoon computer tutorial, “BioInformatics: A Quick Tour with the RuBisCO Large SubUnit,” for the “Summer Workshop on Plant Biochemistry” (July, 1996 & 1997). And designed and delivered a day long computer techniques workshops on introductory prokaryotic sequence analysis (May 1993); and PCR primer design, ‘universal’ versus strain discriminatory (March, 1997 & 1998), for the wet-lab Biochemistry/Biophysics “Molecular Biology Techniques” methodology course. And designed and implemented an afternoon workshop, “Physiology and Biochemistry of Neuropeptides,” containing a hands-on computerized demonstration of sequence analysis applications on the pharmacology of neuropeptides and their receptors for Veterinary Pharmacology (February, 1993 & 1996).

Battelle Pacific Northwest Laboratory, Richland, WA: Designed and delivered a day long workshop, “A JumpStart Primer,” on bacterial genomics, environmental remediation, and getting from sequences to phylogenies (March 1995).

Specialized methods and techniques

Computational sequence analysis and data mining: Includes the GCG Wisconsin Package and SeqLab, EMBOSS, BLAST, FastA, SeaView, ClustalW/X, Muscle, T-Coffee, MAFFT, Mummer, Mauve, HMMer, and MEME/MAST;

Phylogenetic inference and coalescence analysis: Includes PAUP*, PHYLIP, Tree-Puzzle, PhyML, RAxML, GARLI, MrBayes, PAML, ModelTest, ProtTest, Migrate-n, and Lamarc;

Genetics and sequence database maintenance: Includes GCG, SRS, and ACeDB format;

Internet bioinformatics resource expertise: Includes ftp/sftp/scp, telnet/ssh, X-Windowing, and WWW; in Macintosh, DOS/MS Windows, UNIX/Linux, OpenVMS, and html environments.

Laboratory skills: Includes recombinant DNA technology; radioisotope methods; spectroscopy; microscopy and cytogenetics; immunochemistry; chromatography; cell propagation and culture; ultracentrifugation; electrophoresis.

Pedagogy: Includes instructional methodology, curriculum development and implementation, task analysis, experimental design, and evaluation procedures and construction.

Miscellaneous previous experience

Manager: Imported Auto Parts, Flagstaff, AZ (1985–1988), cash and inventory control, employee supervision, public relations.

Trail crew/logging operation: Fairfield Snowbowl, Flagstaff, AZ (1983–1984), heavy equipment, chain saw, and skiing skills.

Coconino Equipment Rental: Flagstaff, AZ (1980–1982); maintenance, use, and repair of all construction equipment.

Yellowfront Retail Stores: Flagstaff & Tempe, AZ (1977–1980); automotive parts, sales and service.

Northern Arizona University: Flagstaff, AZ (1974–1977); audio/visual technician, graphics, darkroom, and photography skills.

Personal interests: outdoor activities — whitewater boating, dual sport motorcycling, bicycling, backcountry skiing, hiking, backpacking, hunting, fishing, and camping; home and automobile — restoration and maintenance; culinary arts — restaurant chef much of student life in AZ and full-time cook at home.

Education

Master of Arts in the Teaching of Biology (May 1988), Northern Arizona University, Flagstaff, AZ:

Admitted to program, February, 1983; supported Fall Semester 1983 through Spring semester 1985 with tuition waivers and Graduate Assistantships. 52 graduate hours: 31 biology/microbiology, 6 chemistry, 3 computer programming, and 12 community college education. Major emphasis: molecular and cellular biology, minor: community college education. Graduate GPA: 3.9.

Bachelor of Science in Biology and Chemistry, Magna Cum Laude (May 1978), Northern Arizona

University, Flagstaff, AZ: Supported by Raymond and Frier foundation scholarships throughout undergraduate terms. Inaugurated to Phi Kappa Phi (October 1977). 130 undergraduate hours: 48 biology, 26 chemistry/physics, 12 calculus, 44 liberal studies.

Public school education, Mesa, AZ (1962–1974): graduated from Mesa High School, 17 of 700.

References

Valdosta State University, Department of Biology, 1500 N Patterson, Valdosta, GA 31698-00115:

Teaching and research colleagues: David L. Bechler, 229-293-6063; John F. Elder, 229-333-5762; Theresa Grove, 229-333-5226; Leslie S. Jones, 229-219-1337; Jonghoon Kang, 229-333-7140; and Brian C. Ring, 229-249-4841.

Florida State University, 600 W. College Avenue, Tallahassee, FL 32306:

Department of Scientific Computing, 400 Dirac Science Library, FSU Mail Code 4120:

Director: Max Gunzburger, 850-644-7060.

And previous Director: Joseph Travis, Department of Biological Sciences, FSU Mail Code 4295, 850-644-5434.

Supervisor while employed at DSC: Jim Wilgenbusch, 850-645-0307.

Former teaching colleagues: Gavin Naylor, now at the College of Charleston, Biology Department, 66 George Street, Charleston, SC 29424, 843-953-5991; and

David Swofford, now at Duke University's Institute for Genome Sciences and Policy, Center for Evolutionary Genomics, Duke Box 90338, Durham, NC 27708, 919-613-7458.

Institute of Molecular Biophysics, 91 Chieftan Way, FSU Mail Code 4380:

Previous Director: W. Ross Ellington, Department of Biological Sciences, FSU Mail Code 1330, 850-645-6900.

Research clients at Florida State University included: Hank W. Bass, Department of Biological Sciences, 850-644-9711; Michael Blaber, College of Medicine, 850-644-3361; Dr. Susanne Cappendijk, College of Medicine, 850-645-1483; David M. Gilbert, Department of Biological Sciences, 850-645-7583; Hong Li,

Department of Chemistry and Biochemistry, 850-644-6785; and Brian G. Miller, Department of Chemistry and Biochemistry, 850-645-6570.

Workshop on Molecular Evolution:

Current Co-Directors: David Hillis, University of Texas, 1 University Station CO930, 2415 Speedway, Austin, TX 78712-1095, 512-471-5792; and Mitchell L. Sogin, Marine Biological Laboratory, 7 MBL Street Woods Hole, MA 02543-1015, 508-289-7246.

Previous Director: Michael Cummings, Center for Bioinformatics and Computational Biology, University of Maryland, College Park, MD 20742-3360, 508-540-2736.

And previous Co-Director: Daniel B. Davison, Bristol-Myers Squibb PRI, Bioinformatics Dept. 502, 5 Research Parkway, Wallingford, CT 06492, 203-284-7958

Interdisciplinary Center for Biotechnology Research:

Associate Director: William Farmerie, University of Florida, PO Box 103622, Gainesville, FL 32610, 352-273-8030.

Center for Visualization, Analysis, and Design in the Molecular Sciences:

Contact: Michael D. Griswold, School of Molecular Biosciences, Washington State University, Mail Biotechnoloy Life Sciences 247, Pullman, WA 99164, 509-335-6281.

Supervisor while employed at VADMS: Susan J. Johns, 11118 Little River Rd., Glide, OR 97443, 541-496-0716.

Publications and Meeting Presentations

Thompson, S.M. (2014, in press) Computational Biology: the Fundamentals of Sequence Based Techniques. In *Computing Handbook, Third Edition: Computer Science and Software Engineering, Volume I*. Diaz-Herrera, J., Gonzalez, T. and Tucker, A., editors, Taylor & Francis Group, Chapman and Hall/CRC Press, Boca Raton, FL USA.

Kang, J. and Thompson, S.M. (2012) A Little Mathematics in an Undergraduate Cell Biology Course. *Biomolecules*, **1**: e103.

Johnson, G.T., Elder, J.F., Thompson, S.M., Hightower, P., and Bechler, D. (2011) Phylogeny of the Freshwater Crayfish Subfamily Cambarinae Based on 16S rDNA Gene Analysis. *Current Trends in Ecology*, **2**: 97–113.

Elder, J.F., Thompson, S.M., and Kang, J. (2011) The Molecular Biology/Immunology Paradigm Extended to Bioinformatics. *Journal of Clinical & Cellular Immunology*, **2**: 111, 1–2.

Conejo, M.S., Thompson, S.M., and Miller, B.G. (2010) Evolutionary Bases of Carbohydrate Recognition and Substrate Discrimination in the ROK Protein Family. *Journal of Molecular Evolution*, **70**: 545–556.

Thompson, S.M. (2009) An Introduction to Multiple Sequence Alignment — and the T-Coffee Shop. Beyond just aligning sequences: How good can you make your alignment, and so what? In *Bioinformatics for Systems Biology*. Krawetz, S.A., editor, Humana Press, Totowa, NJ USA.

Larion, M., Moore, L.B., Thompson, S.M., and Miller, B.G. (2007) Divergent Evolution of Function in the ROK Sugar Kinase Superfamily: Role of Enzyme Loops in Substrate Specificity. *Biochemistry* **46**: 13564–13572.

- Thompson, S.M. (2004) Multiple Sequence Alignment and Analysis: Part I — An Introduction to the Theory and Application of Multiple Sequence Analysis, in *Computational Genomics: Theory and Application*. Grant, R.P., editor, Horizon Scientific Press, Norfolk, UK.
- Thompson, S.M. (2004) Multiple Sequence Alignment and Analysis: Part II — A Practical Tour of SeqLab, the Accelrys GCG Wisconsin Package Graphical User Interface, in *Computational Genomics: Theory and Application*. Grant, R.P., editor, Horizon Scientific Press, Norfolk, UK.
- Thompson, S.M. (2003) An Introduction to Multiple Sequence Alignment and Analysis, in *Introduction to Bioinformatics, A Theoretical And Practical Approach*. Krawetz, S.A. and Womble, D.D., editors, Humana Press, Totowa, NJ USA.
- Thompson, S.M. (2003) Multiple Sequence Alignment and Analysis: The SeqLab Interface — a Practical Guide, in *Introduction to Bioinformatics, A Theoretical And Practical Approach*. Krawetz, S.A. and Womble, D.D., editors, Humana Press, Totowa, NJ USA.
- Thompson, S.M. (2003) Constructing and Refining Multiple Sequence Alignments with PileUp, SeqLab, and the GCG Suite, in *Current Protocols in Bioinformatics*. Baxevanis, A.D., Davison, D.B., Page, R.D., Petsko, G.A., Stormo, G.D. and Leonard, S.A., editors, John Wiley & Sons, Hoboken, NJ USA.
- Bernett, M.J., Blaber, S.I., Scarisbrick, I.A., Dhanarajan, P. Thompson, S.M., and Blaber, M. (2002) Crystal Structure and Biochemical Characterization of Human Kallikrein 6 Reveals that a Trypsin-like Kallikrein is Expressed in the Central Nervous System. *Journal of Biological Chemistry*, **277**: 24562–24570.
- Ristow, S.S., Grabowski, L.D., Thompson, S.M., Warr, G.W., Kaattari, S.L., de Avila, J.M., and Thorgaard, G.H. (1999) Coding Sequences of the MHC II Beta Chain of Homozygous Rainbow Trout (*Oncorhynchus mykiss*). *Developmental and Comparative Immunology*, **23**: 51–60.
- Thompson, S.M. and Speth, R.C. (June, 1997) G-Protein Coupled Receptors: Comparative Analysis and Phylogeny, poster presentation at Gordon Research Conference on Ligand Recognition and Molecular Gating, Sandberg, K., chair, Plymouth State College, Plymouth, NH USA.
- Johns, S.J., Thompson, S.M., and Dunker, A.K. (1995) An Introductory Course in Computational Molecular Biology: Rationale, History, Observations, and Course Description, in *Proceedings of the 1996 Pacific Symposium on Biocomputing*. Hunter, L. and Klein, T.E., editors, World Scientific, River Edge, NJ USA.
- Speth, R.C., Thompson, S.M., and Johns, S.J. (1995) Angiotensin II Receptors: Structural and Functional Considerations, in *Tissue Renin — Angiotensin Systems*. Mukhopadhyay, A. and Raizada, M.K., editors, Plenum Press, New York, NY USA.
- Thompson, S.M., Johns, S.J., and Dunker, A.K. (1995) Educational Issues in Biocomputing, Session Introduction, in *Proceedings of the 1996 Pacific Symposium on Biocomputing*. Hunter, L. and Klein, T.E., editors, World Scientific, River Edge, NJ USA.
- Suarez, C.E., Thompson, S.M., McElwain, T.F., Hines, S.A., and Palmer, G.H. (1994) Conservation of Oligopeptide Motifs in Rhopty Proteins from Erythroparasitic Protozoa. *Experimental Parasitology*, **78**: 246–251.