

Michael A. Thomas, Ph.D.

119 Princeton Avenue
Pocatello, ID 83201
(208) 478-0197, (208) 380-5259
mthomas@isu.edu

APPOINTMENTS

- July 2003– **Assistant Professor of Evolutionary Genomics**, Department of Biological Sciences, Idaho State University, Campus Box 8007, Pocatello, ID 83209. Phone: (208) 282-2396, fax: (208) 282-4570.
- December 2000–June 2003 **Research Scientist**, Bioinformatics Research Center (now call Human & Molecular Genetics Center, Bioinformatics Program), Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226.

EDUCATION

- 2000 Ph.D. in Entomology – Penn State University: Molecular evolutionary genetics.
1994 M.S. in Biology – Kansas State University: Plant evolutionary ecology.
1991 B.S. in Biology – The University of Nebraska.

HONORS

- Award for “Best Annotator” at the Human Genome Annotation Invitational, Tokyo, Japan, Sept 3, 2002. This award was presented to recognize exceptional service in the annotation of human genes. I annotated about 850 of 23,000 full-length cDNA loci.
- Award for “Best Annotator, Runner Up” at the Human Genome Annotation Invitational 2, Tokyo, Japan, November 15, 2003.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- International Society for Computational Biology, since 2005.
- Sigma Xi, The Scientific Research Society, since 1999.
- The Society for the Study of Evolution, since 1998.
- The Society for Molecular Biology and Evolution, since 1998.
- Society of Systematic Biologists, since 1998.

I. Research

PEER-REVIEWED PUBLICATIONS

In review or preparation:

1. Deborah A Johnson and **Michael A. Thomas**. Evolution of expression and constraints on gene duplicate divergence in the monosaccharide transporters of *Arabidopsis* and rice. (In prep.)
2. Pete Hallock, **Michael A. Thomas** and Kenneth Rodnick. Interaction of Steroid Hormones With Glucose Transport in Salmonid Fish. (In prep.)
3. **Michael A. Thomas** and Luobin Yang. Are alternatively spliced mRNA's the product of natural selection for enhancing transcriptome diversity? (In review by *Genome Research*.)

Publications from years at ISU:

1. Mitch Day, Peter Sheridan and **Michael A. Thomas**. 2007. Phylogenetic Signal in Hybridization Fingerprints of Whole-Genome Shotgun Libraries. *PLoS One*, in press. Journal Impact Factor: n/a (new journal). Number of citations: n/a.
2. Deborah A Johnson and **Michael A. Thomas**. 2007. The monosaccharide transporter gene family in *Arabidopsis* and rice: A history of duplications, adaptive evolution and functional divergence. *Molecular Biology and Evolution*, in press. Journal Impact Factor: 6.4. Number of citations: n/a.
3. Scot A. Kelchner and **Michael A. Thomas**. 2006. Nine key questions about model use in phylogenetics. *Trends in Ecology & Evolution* 22: 87-94. Journal Impact Factor: 14.125. Number of citations: .
4. Deborah A Johnson, Jeffrey P Hill and **Michael A. Thomas**. 2006. The monosaccharide transporter gene family in land plants is ancient and shows differential subfamily expression and expansion across lineages. *BMC Evolutionary Biology* 6: 64. Journal Impact Factor: 4.46. Number of citations: .
5. **Michael A. Thomas**, Mitch Day and Luobin Yang. 2005. Computational Options for Bioinformatics Research in Evolutionary Biology. *Proceedings of the 2005 International Conference on Computer Science*.
6. **Michael A. Thomas** & Rebecca D. Klapser. 2004. Genomics for the ecological toolbox. *Trends in Ecology & Evolution* 19: 439-445. Journal Impact Factor: 14.125. Number of citations: .
7. Tadashi Imanishi..., ...**Michael A. Thomas**..., ...Takashi Gojobori (and 148 co-authors). 2004. Integrative Annotation of 23, 149 Human Genes Validated by Full-Length cDNA Clones. *PLoS Biology* 2: 1-21. Journal Impact Factor: 14.1. Number of citations: .
8. Rebecca Klapser and **Michael A. Thomas**. 2004. At the Crossroads of Genomics and Ecology: The Promise of a Canary on a Chip. *BioScience* 54: 403-412. Journal Impact Factor: 4.708. Number of citations: .
9. Michael I. Jensen-Seaman, Terrence S. Furey, Bret A. Payseur, Yontao Lu, Krishna M. Roskin, Chin-Fu Chen, **Michael A. Thomas**, David Haussler, and Howard J. Jacob. 2004. Comparative Recombination Rates in the Rat, Mouse, and Human Genomes. *Genome Research* 14: 528-538. Journal Impact Factor: 10.1. Number of citations: .
10. **Michael A. Thomas**, Benjamin Weston, Moltu Joseph, Wenhua Wu, Anton Nekrutenko, and Peter J. Tonellato. 2003. Evolutionary dynamics of cancer-related genes: Different than other genes. *Molecular Biology and Evolution* 20: 964-968. Journal Impact Factor: 6.4. Number of citations: .

Publications prior to joining ISU:

1. **Michael A. Thomas**, Chin-Fu Chen, Michael I. Jensen-Seaman, Peter J. Tonellato, and Simon N. Twigger. 2003. Phylogenetics of rat inbred strains. *Mammalian Genome* 14:61-64. Journal Impact Factor: 2.279. Number of citations: 14.
2. James H. Marden and **Michael A. Thomas**. 2003. Rowing locomotion by an adult stonefly that retains abdominal gills. *The Biological Journal of the Linnaean Society* 79: 341-349. Journal Impact Factor: 2.445. Number of citations: 5.
3. **Michael A. Thomas**, Kathleen A. Walsh, Melisande R. Wolf, Bruce A. McPheron, and James H. Marden. 2000. Molecular phylogenetic analysis of evolutionary trends in stonefly wing structure and locomotor behavior. *Proceedings of the National Academy of Science, PNAS*. 97: 13178-13183. Journal Impact Factor: 10.231. Number of citations: 12.
4. James H. Marden, Brigid C. O'Donnell, **Michael A. Thomas**, and Jesse Y. Bye. 2000. Surface-skimming locomotion in modern stoneflies and mayflies: a taxonomically diverse and finely graded series of mechanical intermediates between swimming and flying. *Physiological and Biochemical Zoology* 73: 751-764. Journal Impact Factor: 2.066. Number of citations: 7.

GRANT SUPPORT

Total successful competitive funding: \$265,638 (PI: \$106,808; collaborative: \$156,185).

Intramural

- ISU University Research Committee, \$16,185, 2006 (co-PI with Pete Sheridan). Funds support proof-of-principle test for novel method of prokaryotic genome sequencing.
- ISU University Research Committee, \$6,645, 2004 (co-PI with Jeff Hill). Funds supported building of a common use radioisotope facility.
- ISU Biomedical Research Institute (IBRI) seed grant, \$3000, 2006 (co-PI with Larry Farrell and Pete Sheridan). Funds support the sequencing of SN1.
- In support of ISU Bioinformatics Symposia, from the College of A&S, Departments of Biological and Pharmaceutical & Biomedical Sciences, Office of Research, MRCF and the ISU Biomedical Research Institute. These funds covered infrastructure expenses and other costs (2005, '06, '07; ~\$8,000 total).

Extramural

- NSF MRI (Major Research Instrumentation) Award, \$140,000, spring 2005 (co-PI; collaboration with Marjorie Matocq). Funds supported expansion of the ISU Molecular Research Core Facility.
- Pharmaceutical Research & Manufacturers Association (PhRMA) Foundation, \$60,000, 1/1/05 – 12/31/06 (PI). Funds supported preliminary research on alternative splicing in the human genome.
- NSF EPSCoR New Faculty Augmentation Funds, \$12,000 in 2004 and \$22,808 in 2003. Funds supported building bioinformatics facilities for the Thomas lab.
- Apple, Inc., in support of ISU Bioinformatics Symposia; suppliers for refreshments, meals for speakers, promotional material, computational resources and other considerations (2005, '06, '07; ~\$4,000 total).

Pending support

- NSF CAREER: The role of natural selection in genome evolution. Submitted 6/2007. 5 years, \$688,151. A research and education project.

- NIH R15 AREA: Alternative splicing, RNA editing and the origin of proteome complexity. Submitted 10/2007. 3 years, \$180,291. First resubmission of a biomedical research project.
- NSF EPSCoR: The cellular microenvironment. A highly collaborative project involving researchers at ISU, BSU and UI. The Thomas lab component (\$268k per year, 4 years) will develop and test new approaches for metagenomic profiling and modeling.

Unfunded proposals

- NIH R01 2003: Not scored but received strong reviews suggesting fruitful directions and additional preliminary work; \$1,102,739, 5 years.
- Concern Foundation 2003: Proposal to generate preliminary data in support of larger grants; no reviews provided; \$50,000, 1 year.
- NIH R01 2004: Not scored, continuing to receive useful review comments; points towards very intriguing directions that were used in successful, subsequent proposal (Pharma); \$1,143,980, 5 years.
- ORAU 2004: Proposal to generate preliminary data in support of larger grants; no reviews provided; \$5000, 1 year.
- Technology Incentive Grant 2004: To integrate bioinformatics research and education; with Matcoq, Smith, co-PI's; rejected to due inclusion of research goals \$35,000, 1 year.
- AHA 2005: Positive reviews regarding the concept and scope of plan but concerns about the approach used — these were used to strengthen future proposals; \$132,000, 2 years.
- NSF 2005: Strongly positive reviews regarding the concept and scope of the plan but requesting additional preliminary data and validation of the approach; with Scot Kelchner, co-PI; \$452,791, 4 years.
- NIH 2005: Matcoq, PI.
- Beckman Foundation 2005: Proposal to generate preliminary data in support of larger grants; no reviews provided; \$264,000, 1 year.
- NSF-DDIG 2005: Day, co-PI.
- McDonnell 2006: Proposed work similar in scope to NIH-R15; no reviews provided \$418,139, 4 years.
- NIH R15 2006: Scored!; \$180,291, 3 years.
- NIH-COBRE 2007: Not scored (reviews pending); written with Devaud (PI) and Groome, Bearden, Selvage (co-PI's); ~\$8,000,000, 5 years.

RECENT PRESENTATIONS

1. Botany, Chicago: Deborah Johnson and Michael A. Thomas. The monosaccharide transporter gene family in Arabidopsis and rice: A history of duplications, adaptive evolution and functional divergence.
2. SMBE: Michael A. Thomas and Luobin Yang. Are alternatively spliced mRNA's the product of natural selection for enhancing transcriptome diversity?
3. Genome Sequencing and Annotation of the Acidophilic Metal-reducing Bacterium *Acidiphilium cryptum* JF-5. Tina Gresham, Brandon Briggs, Michael Swenson, Mitch Day, Loubin Yang, Michael A. Thomas, Peter P. Sheridan, David Sims, Paul Richardson, Dave Kerk, David E. Cummings, and Timothy S. Magnuson. Joint Genome Institute conference on microbial genomics, March, 2007.
4. Human health consequences of genome processes. Snake River Neurological Consortium. Jackson, WY, September 28-30, 2006.
5. Detecting "selection conflict" in the human genome. Idaho INBRE annual meeting. Coeur d'Alene, ID, August 6-8, 2006.

6. Deborah Johnson, Jeff Hill, and Michael A. Thomas. Monosaccharide transporter gene family evolution in divergent land plant lineages: A hidden Markov model approach. The Biology of Genomes, Cold Spring Harbor Lab, May 11-15, 2005.
7. HPC for Bioinformatics Research & Education in Evolutionary Biology, International Conference on Computer Science, Atlanta, GA, May 22-26, 2005.
8. Invited talk: Darwinian and purifying selection in the human genome. Department of Biology seminar, Boise State University, November 7, 2003.
9. The Potential of cross-species microarray experiments for ecology & evolution. Annual Meeting of the Ecological Society of America. Savannah, GA, August 5, 2003.
10. Variation in the evolutionary dynamics of human genes by molecular function and cellular component. Meeting of the 7th World Multiconference on Systemics, Cybernetics and Informatics. Orlando, FL, July 24, 2003
11. Jensen-Seaman M.I., Chen C.-F., Thomas M.A., Nie J., Jacob H.J. Comparative Recombination Rates in Mammals. Podium presentation, Society for the Study of Evolution, Annual Conference, Chico, CA, June 20-25, 2003.
12. Thomas, Michael A., Moltu Joseph, and Peter J. Tonellato. Evolutionary dynamics of human genes: Oncogenes and tumor suppressor genes are different. Cold Spring Harbor Lab Conference for Genome Informatics, CSHL, NY, May 7 – 11, 2003.
13. Invited talk: Evolutionary dynamics of human oncogenes: What can evolution tell us about disease? University of Wisconsin – Madison, Department of Biomedical Informatics and Biostatistics, April 11, 2003.
14. Evolutionary dynamics of human genes. Medical College of Wisconsin, March 7, 2003.
15. Invited talk: Evolutionary dynamics of human oncogenes. University of Wisconsin – Whitewater, February 21, 2003.
16. Invited talk: Templates, formats, & tools – Bioinformatics infrastructure for microarray data analysis and interpretation. Microarray Science in General Clinical Research, a workshop of the 4th Annual National Center for Research Resources Bioinformatics Conference, Boston, September 29th, 2002.
17. Thomas, Michael A., et al. Phylogenetics of inbred rat strains. Society for the Study of Evolution, Annual Conference, Urbana, IL, June 28 – July 2, 2002.
18. Invited talk: Gene expression analysis for toxicogenomics: Analyzing, managing, and sharing microarray data. Community participation in genomic databases, Mount Desert Island Biological Laboratory, Salsbury Cove, ME, May 3 & 4, 2002.
19. Nie, Jeff, Dan Chen, Sam Cheng, Li Gao, Michael A. Thomas and Peter J. Tonellato. 2001. ASAP: The Automated Sequence Analysis Pipeline. Genome Biology meeting at Cold Spring Harbor Lab, NY, May 7-20, 2002.
20. Invited talk: Integrating bioinformatics tools for gene discovery: It's not just for disease genes anymore. Department of Biology, University of Northern Iowa, April 3, 2002.
21. Invited talk: Integrated genomic techniques for understanding the genetic component of disease. The National Institute for Genetics (Japan), Mishima, Japan, November 7, 2001.
22. Thomas, Michael A., et al., Phylogenetics of inbred rat strains. Symposium on Evolutionary Genomics, Atami, Japan, November 6, 2001.
23. Integrated genomic techniques for understanding the genetic component of disease. The Japanese Biological Information Research Center, Tokyo, Japan. November 9, 2001.
24. The Rat Genome Database: Mapping disease onto genomes. Symposium on Evolutionary Genomics, Atami, Japan, November 6, 2001.
25. Invited talk: Disease-centric sequence analysis: Gene hunting and comparison analysis. Congress of the International Union of Physiological Sciences, Christchurch, New Zealand, August 29, 2001.

26. The microarray data management and analysis pipeline at the BRC: a tool for disease-centric research. Presented at the Human Genetics Symposium on Human Biology: Genes, Genomes, and Molecules, in Madison, Wisconsin, May, 2001.
27. Jiang, Nan, Zhitao Wang, Jason Von Bergen, Manuel J. Torres, Michael A. Thomas, and Peter J. Tonellato. 2001. A microarray data management and analysis pipeline. Human Genetics Symposium on Human Biology: Genes, Genomes, and Molecules, in Madison, WI.

II. Education

TEACHING EXPERIENCE

- Idaho State University: Organic Evolution. Spring 2005, Fall 2005, 2006, 2007. An undergraduate course examining history, theory, and applications of evolutionary biology.
- Idaho State University: Molecular Evolution & Phylogenetics. Fall 2004, 2005, Spring 2007. A graduate course examining theoretical foundations and applications of molecular evolution, with an emphasis on hands-on experience.
- Idaho State University: Bioinformatics. Spring 2004, 2005, Fall 2006. A graduate course examining theory and practice of bioinformatics and computational biology with an emphasis on applications of interest to research biologists and hands-on experience.
- Idaho State University: Senior seminar (3 sections, 2005–'07)
- Medical College of Wisconsin: Bioinformatics I (fall semester) & II (spring semester), joint MCW/Marquette courses. Fall 2001 (3 guest lectures on the basics of molecular evolution); Spring, 2002 (5 guest lectures on data mining and genome annotation); and Fall 2002, Spring 2003 (co-instructor, with Craig Struble, Marquette University).
- Penn State University: Mentoring of undergraduate researchers in the Bruce McPherson laboratory, July, 1996 – May, 2000. I supervised paid workers and guided the development and execution of independent projects. Most of the students I mentored were recruited by me from classes I taught. These students have gone on to medical school and graduate school.
- Penn State University: Department of Biology, Graduate Teaching Assistant: Molecules and Cells, Fall, 1996, 1997, 1998 (6 lab sections); Populations and Communities, Spring, 1997 (2 lab sections); and Function & Development of Organisms, Spring, 1998 (2 lab sections).
- Kansas State University: Division of Biology, Graduate Teaching Assistant: Principles of Biology, Fall, 1992, Spring 1994 (4 auto-tutorial lab sections); Organismal Biology, Spring, 1993 (1 lab section); and Population Biology, Fall, 1994 (1 recitation section).
- University of Nebraska – Lincoln: School of Biological Sciences, Undergraduate Teaching Assistant: General Biology, Fall, 1989 – Spring, 1991 (1 recitation and 8 lab sections).

GRADUATE MENTORING

Current lab members:

- Erin Naegle, a D.A. student, from September 2006. Co-advisor with Paul Beardsley.
- Pete Hallock, a Ph.D. student, from September 2006.
- Kelsey Metzger, a D.A. student, from January 2006.
- Luobin Yang, a part-time Ph.D. student, from August 2005.
- Shannon Barry, an M.S. student, from January 2005.

Lab alumni:

- Deborah Alongi Johnson, Ph.D. 2007. Co-advised with Jeff Hill.
- Mitch Day, Ph.D. 2007.

Graduate committees

- Amanda Fisher, a Ph.D. student, from September 2005
- Vanessa Tanner, a Ph.D. student, from September 2005

- Brandon Atkins
- Tejuswita Karve, a M.S. student, from October 2004
- Traci Hudson, a Ph.D. student, from February 2004
- Eric Lee, a Ph.D. student, from February 2004
- Quinn Shurtliff, a Ph.D. student, from December 2003
- Robert VanTrees, a M.S. student, from January 2004
- Julie Wemple, a Ph.D. student, from April 2004
- Joy Olbertz, a Ph.D. student in Pharmaceutical Science, from May 2004
- Co-Advisor for Moltu Joseph, an M.S. graduate in the Marquette University Bioinformatics Program, January 2002 – May 2003 (with Stephen Merrill)

III. Service

ISU SERVICE

Department of Biological Sciences, ISU:

- Organizer, ISU Bioinformatics Symposia. In support of each of these events, I have obtained funding from a variety of academic and industrial sources.
 - 2008: The theme will be “evolutionary bioinformatics.” To be held in Lava Hot Springs.
 - 2007: The theme was “biomedical bioinformatics,” and featured research talks on approaches and applications biomedical research. Held in Lava Hot Springs.
 - 2006: Genome Annotation of *Acidophilium cryptum* (sequence generated by Tim Magnuson’s lab). Held at ISU in the Plant Sciences Lecture Hall.
 - 2005: Training sessions for the use of standard bioinformatics approaches and highlighted research talks of users of those tools. Held at ISU in the College of Pharmacy.
- Committee service:
 - i. Matocq T&P review, 2006.
 - ii. Biological Education search committee, 2006.
 - iii. Entomology search committee, 2006–’07.
 - iv. Biology Development committee, 2005–’06.
 - v. Cell Biology search committee, 2005.

College of Arts & Sciences, ISU:

- Committee service:
 - i. Faculty Retention committee, 2005–’06.

Idaho State University:

- ISU Faculty Senate: Executive Committee, 2007–’08. Elected by Senate colleagues for 1 year term.
- ISU Faculty Senate: Biology Senator, 2006-2008. Elected by Biology colleagues for 2 terms as sabbatical replacements for Delahanty (2006–’07) and Magnuson (2007–’08).
- Peer reviewer (internal): ISU Distinguished Researcher (2005–’06), for Huntly nomination.
- ISU Biomedical Research Institute (IBRI): Steering committee, 2004–’07.
- Student Recruitment & Retention Committee: Faculty Senate representative, 2006–’07.
- Enterprise Resource Planning (ERP): Infrastructure committee member, 2005–’06.

Professional service:

- Sigma Xi: ISU chapter president, 2007–’08; vice president, 2006–’07.
- Substantial service in collaboration with the Idaho INBRE program:
 - i. ISU Bioinformatics facility coordinator: continue to enlarge the ISU bioinformatics infrastructure, train students and faculty to use computing facilities, and provide outreach to nearby institutions.
 - ii. 2004 INBRE conference (Nampa) undergraduate bioinformatics training session: organized a panel discussion and educational bioinformatics exercises.
- Grant proposal reviewer for Charles A. & Anne Morrow Lindbergh Foundation (2005, 2006) and North Carolina Biotechnology Center (2006).

- Manuscript reviewer for journals *Heredity* and *Bioinformatics*.
- The Second Human Genome Annotation Invitational (“H-Inv 2”), participant, November 8 – 15, 2003, Tokyo, Japan.
- UI Biology Department, Bioinformatics Search Committee: Outside member, 2005.
- Bio-IT World Annual Conference: Best of Show judge, 2005–’07.

SERVICE PRIOR TO JOINING ISU:

- Human Genome Annotation Invitational (“H-Inv”), participant and organizing committee member, August 28 – September 8, 2002, Tokyo, Japan. Planning committee member, March 3-6, 2002.
- Waterfront Symposium on Human Genomics (WASH). Conference Chair for Bioinformatics II session, March 2-3, 2002, Tokyo, Japan.
- Coordinator, Bioinformatics I & II courses, Fall, 2001 – present. This is part of the core curriculum for the graduate degree program in Bioinformatics (offering M.S. degrees) jointly offered by the Medical College of Wisconsin and Marquette University.
- Coordinator, Mini Rat Annotation Jamboree, December 15-17, 2001, Milwaukee, WI. The “Mini-RAJ” was a local gathering of scientists to review the results of an automated annotation of 15Mbp segment of the rat genome. The goal was to test automated procedures to be used during a full Rat Annotation Jamboree and for the annotation of other genomes.
- Coordinator, The BRC Seminar Series, September 2001 – May 2003. I initiated the series to enrich the scientific experience of the MCW- BRC members and students. To fund the series, I wrote a proposal that convinced the Dean of the MCW Graduate School to invest \$12,000 annually. Speakers come from around the world. From these visits, we have initiated a number of fruitful collaborations.
- Coordinator, Microarray Science & Technology Seminar Series, Spring, 2001, MCW-BRC.
- BRC Strategy Committee member (January, 2001 – May, 2003) and chair (2002). We developed a plan for the reorganization of the MCW- BRC during a time of rapid growth.
- Strategy Committee, graduate student member, August, 1999-May, 2000, Dept. of Entomology, Penn State University. We developed a plan for future faculty hiring to direct the growth and development of the department for the next decade.
- Space Planning Committee, graduate student member, August, 1998-May, 1999, Dept. of Entomology, Penn State University. We determined departmental space needs and formulated a proposal to optimize faculty and graduate student resources.