

# Lawrence E. Hunter, PhD

## Personal History

### Current Positions:

University of Colorado, Professor, 2008 to present:  
School of Medicine, Department of Pharmacology  
School of Public Health, Department of Biometrics  
Arts & Sciences (Boulder), Department of Computer Science  
Arts & Sciences (Denver), Department of Biology  
Center for Computational Pharmacology (Director)  
Computational Bioscience Program (Director)  
Biomolecular Structure Program  
Cardiovascular Institute  
Cancer Center  
Human Medical Genetics Program

### Professional Address:

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## Education

- B.A. in Psychology, 1982, Yale University, *cum laude*.
- M.S. and M.Phil. in Computer Science, 1987, Yale University.
- Ph.D. in Computer Science, 1989, Yale University.
- Thesis: *Knowledge Acquisition Planning: Gaining Expertise Through Experience*, advised by Roger Schank.

## Academic Appointments

Teaching Assistant, Yale University, Computer Science Department 1983-1988.  
Adjunct Assistant Professor, George Mason University, Computational Science and Informatics, 1991-1997  
Adjunct Associate Professor, George Mason University, Computational Science and Informatics, 1997-2000  
Fellow, Krasnow Institute of Advanced Study in Cognition, 1995-2000.  
Associate Professor, University of Colorado School of Medicine, 2000-2008.  
Professor, University of Colorado School of Medicine, 2008-

## **Other Professional Positions**

### Government Positions

Board of Scientific Counselors, Environmental Protection Agency, Office of Research and Development / Computational Toxicology Subcommittee 2009-

Chief of Section, National Cancer Institute (NIH), Section on Molecular Statistics and Bioinformatics, 1999-2000.

Computer Scientist, National Library of Medicine (NIH), Lister Hill Center, 1989-1999.

National Science Foundation Scientific Database Network Project, Board of Directors, 1992-1996;

### Corporate Positions

Founder & Member of the Board of Directors, Molecular Mining Corporation, 1997-2003

Cooperative Research and Development Agreement (CRADA) with VIPS Systems, Inc. 1998-2000

Consultant, Medical Scientists, Inc. (1998-2005)

Consultant, SmithKlein Beecham, Inc. (1996-2000)

## **Honors, Special Recognition, and Awards**

Engelmore Prize for Innovative Applications of Artificial Intelligence, 2003 (presented by the American Association for Artificial Intelligence)

Fellow, American College of Medical Informatics, 2002-

Regent's Award for Scholarship and Technical Achievement, (the highest honor granted by the National Library of Medicine), 1994.

Meritorious Service Award, National Library of Medicine, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998

Winner, student paper competition, Knowledge Acquisition for Knowledge Based Systems Workshop, 1988.

National Merit Scholar, 1978

## **Membership in professional organizations**

International Society for Computational Biology, 1996-. Founder, 1996; President 1996-2000; Awards Committee Chair, 2003-2005; Finance Committee Chair 2005-2007; member of the Board of Directors, 1996-2007

American Association for Artificial Intelligence, 1984-

American Medical Informatics Association, 1990-, Publications Committee (1990-1993)

International Biomatrix Society, Board of Directors, 1991-1996;

## **Major Committee and Service Responsibilities**

### Departmental

Curriculum Committee, 2000-2004

Faculty Search Committee, 2002-2003

Space Planning Committee, 2003-2009

Graduate Training Committee, 2007

Promotion and Tenure Committee, 2009-

Center for Computational Pharmacology, 2000- (Director)

### School of Medicine

Strategic Plan Committee, 2002-2003

Research Advisory Committee, 2003-2005

Computational Bioscience Program, 2004- (Director)

### UCDHSC

Search Committee, Director of the Dennison Library, (2006-2007)

### CU Boulder

Faculty Search Committee, Computer Science Department (2005)

Molecular Biotechnology Initiative (2005-2006)

### CU Denver

Steering Committee, CU Denver Center for Computational Biology (2001-2006)

### CU System

University Without Walls (2002-2004)

Genomics Taskforce (2001-2005)

### National Scientific Advisory Boards

Rat Genome Database, Scientific Advisory Board, 2007-

Gene Ontology Consortium, Scientific Advisory Board 2004-

Columbia University Department of Biomedical Informatics, External Reviewer 2004

University of Michigan Computational Biology Program, External Reviewer 2003

### National / International Conference Organizing

Founder, International Conference on Intelligent Systems for Molecular Biology 1993 (Cochair, 1993; Organizing committee 1994-1996). Still the most successful academic conference in bioinformatics

Founder and Cochair, Pacific Symposium on Biocomputing (1996-)

Founder and Program Chair, Rocky Mountain Regional Conference on Computational Biology (2004-)

Program chair, Biotechnology Computing Track, Hawaiian International Conference on System Sciences, 1993, 1994, 1995.

Program chair, Biotechnology Computing Minitrack, Hawaiian International Conference on System Sciences, 1991, 1992

Area Chair for Machine Learning, National Conference on Artificial Intelligence, 1992, 1993.

Program committee, AAAI-91 Workshop on Pattern Recognition and Inference in Molecular Biology, 1991

Program chair, AAAI Spring Symposium on Artificial Intelligence and Molecular Biology, 1990.

Program committee, International Conference on the Biomatrix, 1990

### **Patents**

*A System for Synergistic Combination of Multiple Automatic Induction Methods and Re-Representations of Data.* US Patent 6,449,603, issued September 10, 2002. Licensed to firms in healthcare, insurance and the pharmaceutical industry.

*A Machine Learning Method for Predicting Rare but Significant Events.* US Patent 6,917,926 issued July 12, 2005. Coinventors Hung-Han Chen, Harry Poteat and Kristin Kendall.

### **Review and referee work**

#### Service on Editorial Boards

Associate Editor, *Journal of Biomedical Informatics*, 2002-

Associate Editor, *PLoS Computational Biology*, 2010-

Associate Editor, *Bioinformatics*, 2010-

Editorial Board, *Journal of Machine Learning Research*, 1999-2004

Special editor, *IEEE Expert*, track on Molecular Biology Applications, 1996.

Associate Editor, *Journal of Artificial Intelligence Research*, 1993-1997

Editorial board, *Artificial Intelligence and Medicine*, 1993-1995

Editorial board, *Journal of Computational Molecular Cell Biology*, 1993-1998

#### Grant Study Sections and Ad Hoc Grant Reviews

Ad hoc reviewer, NCCR / CTSA reviews, 2010

Ad hoc reviewer, National Library of Medicine, 2009

Chair, NIAID Special Emphasis Panel ZAI1 MP-I (S4), 2008

Biomedical Library and Informatics Review Committee, National Library of Medicine study section, 2004-2008

Ad hoc reviewer, National Library of Medicine, 1999-2004

Ad hoc reviewer, NIH Roadmap U54 Interdisciplinary Research Consortia, 2007

Ad hoc reviewer, National Institute of General Medical Sciences, 2004

Ad hoc reviewer, National Academy of Sciences, 2003

Genome Canada Research Review Panel, 2001, 2003

Ad hoc reviewer, National Institute for Mental Health, 2000

Human Brain Project (trans-NIH review section), 1997-1999

Ad hoc reviewer, National Institute for Mental Health (Research Contracts), 1998

**Invited lectures and presentations (highlights)**

*Visualization in Biology*, invited capstone panel presentation, IEEE VizWeek, Oct. 2009

*Rethinking our goals for BioNLP and its evaluation*, Keynote address, BioCreative II.5, October 2009

*Innovative Training for Bioinformatics*, Invited address, National Library of Medicine Board of Regents, September 2009

*Tools for Scientific Insight*, invited presentation, SRI International, October 2007

*Twenty Years of Planning to Learn*, keynote presentation, Planning to Learn workshop, European Conference on Machine Learning, September 2007

*New ideas for secondary school biology education*, Ewing Marion Kaufmann Foundation, May 2006

*Bioinformatics: Putting Systems Biology Information in Context*, lecture in UCHSC Systems Biology and Biomedical Research Symposium, Dec 2, 2005

*Language, Knowledge and Molecular Biology*, Invited presentation to Yale Bioinformatics Symposium, New Haven, CT, November 3, 2005

*Biomedical Language Processing*, Keynote address to Human Language Technology / Empirical Methods in Natural Language Processing conference, Vancouver, Canada, Oct. 6, 2005

*Biognostic Systems*, Keynote address to Italian Association for Artificial Intelligence conference, Milan, Italy Sept. 20, 2005

*The Role of Community in Computational Biology*, keynote address to the Rocky Mountain Regional Bioinformatics Meeting ("Rocky 1") in Aspen, Colorado, December 5-7, 2003.

*The Era of Biognostic Machines*, keynote address to Association for Computing Machinery Special Interest Group on Applied Computing (ACM-SAC) conference., 2003

*Proteomic Bioinformatics*, Center for Computational Pharmacology mini-symposium, 2003

*Biognostic Machines for Cognitive Disability*, invited address, Coleman Institute annual meeting, 2002

*Bioinformatics and Human Health*, UCHSC Chancellor's Luncheon Address, 2002

*Data Mining for High Throughput Biomedicine*, keynote address to the Research Society on Alcoholism conference, Denver, Colorado, June 2000

*Edgar: Extraction of Drugs, Genes and Relations from the Biomedical Literature*, Pacific Symposium on Biocomputing, January, 2000

*The Role of Machine Learning and Natural Language Processing in Contemporary Drug Discovery*, Pharmacology Grand Rounds, University of Colorado School of Medicine, October, 1999

*Inductive Modeling: Power and Pitfalls*, keynote address to MODEL-IT conference, Wageningen, the Netherlands, November 1998

*Coevolution of Symbol Systems and Behavior*, lecture and workshop, Simulations of Adaptive Behavior conference, Zurich, Switzerland, August 1998.

*Machine Learning for Drug Discovery*, invited address, SmithKline Beecham Data Mining Days, November 1997.

*Computer Science : Biology :: Mathematics : Physics*, MIT Media lab, April 1997

*The Role of Computation in Cognitive Science*, Krasnow Institute for Advanced Study of Cognition Seminar Series, November, 1996.

*Coevolution Learning: Synergetic Evolution of Learning Agents and Problem Representations*, Multistrategy Learning Workshop, June, 1996.

*AI Models for Biology, and Biological Models for AI*, Keynote address, Second International Conference on Intelligent Systems for Molecular Biology, July 1995.

*Computers, Modelling , and Theoretical Biology*, Invited address to the Keystone Center Scientist to Scientist Colloquium, August, 1994

*The National Library of Medicine on the Internet: A Digital Library for Biomedicine*. Invited address to the Computers and Chemistry Division of the American Chemical Society conference, Aug 1994

*Planning to Discover in Molecular Biology*, MIT AI Lab Revolving Seminar Series, April 1994

*Molecular Biology for the Computer Scientist*, Full day tutorial at the Hawaiian International Conference on System Sciences, January 1993. Repeated Jan 1994.

*AI & Molecular Biology*, Plenary address, National Conference on Artificial Intelligence, San Jose, CA, July 1992.

*Megaclustering of Unsegmented Datastreams and Applications to Molecular Biology*, Johns Hopkins Applied Physics Laboratory distinguished lecture series, October 1992.

*Electronic Facilitation of Scientific Communication*, Panel organizer and speaker, International Conference on the Biomatrix, George Mason University, July 1990

*Knowledge Acquisition Planning for Inference from Large Datasets*, Keynote address, 1990 Conference on AI Systems in Government, Washington, DC, May 1990

*Machine Learning: Ready for Industrial Application*, Invited address to Third Annual Artificial Intelligence Forum, Sanibel Island, FL, February, 1989

*Artificial Neural Networks as Theories of Mind*. International Neural Network Society, Boston MA, September, 1988

*Machine Learning for Molecular Biology*. Invited address to the Theoretical Biology and Biophysics Group, Los Alamos National Laboratory, June 1988

*Indexing and Recognition*. AI/BioMed: The First International Conference on Artificial Intelligence and its Impacts in Biology and Medicine, Montpellier, France, September 1986

*Computers and Privacy*. Guest lecture in Constitutional Law, University of Connecticut at Hartford Law School, Dec., 1985.

## **Teaching record**

### Courses taught

2010 SoM CPBS 7712 *Research in Computational Biology*

2009 SoM CPBS 7711 *Introduction to Computational Biology*

2008 SoM BIOI 7605 *Ethics and Values in Computational Biology*

2004 BIOI 7791 *Readings in Computational Biology*

2003-2006 SoM BIOI 7713 (each year) *Research in Computational Biology*

2003, 2005 BIOI 7792 *Special Topics in Computational Biology*

2002-2007 SoM BIOI 7710, 7711 (each year) *Introduction to Computational Biology*

2002, 2003 University of Colorado, Denver, BIOL 5099 *Biology for Computer Scientists, Mathematicians and Engineers*

2001 PHCL 7611 *Advanced Statistics for Pharmacology*

2000 PHCL 6611 *Statistics for Pharmacology*

1991-1999 George Mason University *Graduate Computational Bioscience*

### Lectures given in other courses

2003-2009 PHCL 7561 *Bioinformatics in Drug Discovery*

2004-2009 PHCL 7600 *Innovative Bioinformatics for Pharmacology*

2004-2009 Informatics Elective for Residents *Clinical Bioinformatics*

2001 PHRD 4450 *Ethical Issues in Pharmacy Informatics*

### Courses Created

BIOI 7605 (now CPBS 7605) *Ethics and Values in Computational Biology*

BIOI 7710 *Survey of Bioinformatics Methods*

BIOI 7711 (now CPBS 7711) *Introduction to Computational Biology*

BIOI 7712 (now CPBS 7712) *Research in Computational Biology*

BIOI 7713 *Graduate Bioinformatics 3* (now included in 7712)

BIOI 7791 *Readings in Bioinformatics*

BIOI 7792 *Special Topics in Bioinformatics*

BIOL 5099 (CU Denver) *Molecular Biology for Computer Scientists, Mathematicians and Engineers*

### Administrative Positions

Director, Computational Bioscience Training Program

Principle Investigator, Computational Bioscience Training Grant

### Teaching Awards

Excellence in Teaching Award, Preventive Medicine and Biometrics Department, 2004.

### Ph.D. Dissertations Directed

Jeffery L. Krichmar, *A Computational Model of Cerebellar of Saccadic Control*, GMU Computational Science and Informatics, 1997.

Judith E. Devany, *Equation Discovery Through Global Self-Referential Geometric Invariants and Machine Learning*, GMU Information Technology, 1997.

Imran Shah, *Predicting Enzyme Function from Sequence*, GMU Computational Science and Informatics, 1998

Barry Zeeberg, *Whole Genome Information Analysis and Processing*, GMU Computational Science and Informatics, 1999

Robert S. Erb, *Analysis and Modeling of Gene Expression Circuits*, GMU Computational Science and Informatics, 1999

Myriam Abramson, *Learning Coordination Strategies* GMU Information Technology, 2003.

Lorraine Tanabe, *Text mining the biomedical literature for genetic interactions* GMU Computational Science and Informatics, 2003

Ronald Taylor *Reconstruction of metabolic and genetic networks from gene expression perturbation data using a Boolean model: construction of a simulation testbed and an empirical exploration of some of the limits* GMU Computational Science and Informatics, 2003.

Min Hong, *Implicit constraint enforcement to control physically-based biomedical simulation* UCHSC Computational Bioscience 2005

Steve Russell, *Machine Learning and In-silico Modeling for Improved Identification of Peptides from Shotgun Proteomic MS/MS Spectra*. UCHSC Computational Bioscience 2005

Sonia Leach, *Informed Structural Priors for Bayesian Networks: Applications in Molecular Biology Using Heterogeneous Data Sources* Brown University Computer Science 2006

Zhiyong Lu, *Text Mining on GeneRIFs*, UCHSC Computational Bioscience 2007

Anis Karimpour-Fard, *Prediction of protein-protein interactions and function in bacteria* UCHSC Computational Bioscience 2008

Elizabeth White, *Pattern-Based Recovery of Argumentation from Scientific Text*, UC Boulder Computer Science, 2009

Formal Junior Faculty Mentoring

Deborah Glueck, Department of Preventive Medicine and Biometrics  
Debra Goldberg, Department of Computer Science (Boulder).

**Grant support:**

<u>Active Grants (Principle Investigator)</u>	<u>Annual direct costs</u>
NIH 2R01LM009254-04 <i>Biomedical Language Processing Writ Large: Scaling to all of PubMedCentral</i>	9/2009-8/2014 \$404,767
NIH 2R01LM008111-04A1 <i>Technology Development for a Molecular Biology Knowledge-base</i>	10/2008-3/2013 \$401,329
NIH 5G08LM009639-02 <i>Construction of a Full Text Corpus for Biomedical Text Mining</i>	9/2007- 9/2010 \$144,924
NIH 5R01GM083649-02 <i>Ontologies and Biomedical Language Processing</i>	9/2007- 8/2011 \$631,600
NIH 5T15LM009451-02 <i>Computational Bioscience Program Training Grant</i>	7/2007-6/2012 \$472,566
<u>Pending Grants (Principle Investigator)</u>	
NIH 1U54GM095331 <i>Center for Knowledge-based Analysis at Genomic Scale</i>	9/2010-8/2015 \$2,324,524
NSF Proposal No: 1010261 <i>US-German Collaboration: Unraveling CNS regeneration - From Fact Extraction to Experiment Design</i>	6/2010-5/2015 \$103,735
<u>Active Grants (Co-investigator)</u>	
<u>Prior Grants (Principle Investigator)</u>	
NIH/Clinical Center Research Contract <i>Gene Expression Array Analysis for Investigation of Sepsis</i>	7/2000-6/2001 \$100,000

NIH 1U01 AA13524	9/2001-8/2006	\$500,000
<i>Neuroinformatics Core for the Integrated Neuroscience Initiative on Alcoholism</i>		
Genetics Institute / Wyeth-Ayerst	9/2001-8/2003	\$113,650
<i>Development of Biological Literature Text Mining Software</i>		
NIH 5R01LM009254	9/2006-8/2009	\$247,885
<i>Beyond Abstracts: Issues in Mining Full Texts</i>		

Prior Grants (Co-investigator)

NIH 5R01 DE015191-02 (Richard Spritz, PI) 4/04-3/08  
*Gene Discovery for Craniofacial Disorders*

NIH 5P50 CA058187-09 (Paul Bunn, PI) 9/92-4/08  
*SPORE Grant in Lung Cancer*

Canine Health Foundation (Jamie Modiano, PI) 12/2005 – 11/2008  
*Spontaneous Canine Tumors as Models for Cancer Gene Discovery*

NIH 5P01 HL68743 (Edward Abraham, PI) 9/2002-8/2007  
*Heterogeneous neutrophil responses in acute lung injury*

NIH 1 R24 AA13162-01 (Boris Tabakoff, PI) 4/2001-3/2006  
*Gene Expression Array Technology Center for Alcohol Research*

NIH 1M01 RR00051 (Robert Eckel, PI) 4/2002-3/2007  
*University of Colorado General Clinical Research Center.*

NIH 5 P30 CA46934-15 (Paul Bunn, PI) 3/1988-1/2006  
*Cancer Center Support Grant.*

NIH P01 HL67671-01 (Robert Mason, PI) 7/2001-6/2004  
*SCOR: Pathobiology of Fibrotic Lung Disease.*

Cystic Fibrosis Foundation, (David Rodman, PI) 4/2001-3/2003  
*Effects of Pseudomonas aeruginosa on Inflammatory Gene Expression.*

NIH 5R01HL072340-02 (Mark Geraci, PI) 10/2002-9/2005  
*Application of expression analysis to study disease pathogenesis*

## Philanthropic gifts received

IBM, 2007: \$24,000 UIMA Innovation Award

Hibernia, Inc., 2006: \$500 Fund for computational bioscience recruiting

Oracle, 2005: CIT Innovation award (license, support & training for Oracle 10g, value \$2500)

Hitachi, 2005: CIT Innovation award (10TB RAID Array, value: \$50,000)

IBM, 2003 (p690 Supercomputer with 64GB of RAM, value \$990,000)

## Bibliography

### Peer Reviewed Publications

1. **Hunter, L.**, Schank, RC. Encapsulation and Expectation: A response to Fodor's Modularity of Mind. *Behavioral and Brain Sciences*, 8(1): 29-30, 1985.
2. **Hunter, L.** Indexing and Recognition: Metaknowledge for Organizing Information. *Proceedings of AI/BioMed: The First International Conference on Artificial Intelligence and its Impacts in Biology and Medicine*, Montpellier, France, September 1986, p.93-5
3. **Hunter, L.** Steps Toward building a Dynamic Memory. *Proceedings of the Third International Workshop in Machine Learning*, Skytop, PA, June 1986, p.70-74, Morgan Kaufmann Associates, San Mateo, CA
4. Collins, G., **Hunter, L.**, Schank, RC. Transcending Inductive Category Formation in Learning, *Behavioral and Brain Sciences*, 9(4):639-686, December 1986.
5. **Hunter, L.** and Silbert, J. Progress Report on IVY: A Learning System for Information Retrieval in Pathology, *Proceedings of the Artificial Intelligence and Medicine Workshop*, Seattle WA, 1987.
6. **Hunter, L.** Knowledge Acquisition Planning. *Third Knowledge Acquisition for Knowledge Based Systems Workshop*, Banff, Alberta, Canada, November, 1988 (Winner, best student paper prize)
7. **Hunter, L.** Artificial Neural Networks as Theories of Mind. *Proceedings of First Annual Conference of the International Neural Network Society*, Boston MA, September, 1988, IEEE Computer Society Press, Los Alamitos, CA.
8. **Hunter, L.** Explanation Based Discovery. *Proceedings of the AAAI Symposium on Explanation Based Learning*, Stanford, CA, March 1988, pp. 2-7.
9. **Hunter, L.**, Some Memory, but No Mind: A response to Smolensky's On the Proper Treatment of Connectionism. *Behavioral and Brain Sciences*, 11(1), March 1988
10. **Hunter, L.** Estimating Human Cognitive Capacities *Cognitive Science*, 12(2):257-261, April-June 1988

11. **Hunter, L.** Planning to Learn, *The Proceedings of The Twelfth Annual Conference of the Cognitive Science Society*, Boston, MA., July 1990, pp. 26-34, Lawrence Erlbaum Associates, Hillsdale, NJ.
12. **Hunter, L.** Knowledge Acquisition Planning for Inference from Large Datasets, *The Proceedings of The Twenty Third Annual Hawaii International Conference on System Sciences, Kona, HI. vol. 2, Software track*, pp. 35-44. IEEE Press, 1990.
13. **Hunter, L. & Ram, A.** The Use of Explicit Goals for Knowledge to Guide Inference and Learning, *Proceedings of the Eighth International Workshop on Machine Learning*, Chicago, IL, June 1991, pp. 265-269, Morgan Kaufmann, San Mateo, CA.
14. **Hunter, L.** Applying Bayesian Classification to Protein Structure, *Proceedings of the Seventh Conference on Artificial Intelligence Applications*, vol. 1. Los Alamitos, CA: IEEE Computer Society Press. Feb. 1991; 10-16.
15. **Hunter, L.** Artificial Intelligence and Molecular Biology, *AI Magazine* 11(5):27-36, 1991 Supplement.
16. **Hunter, L.** Bayesian Classification of Protein Structure Fragments, *The Proceedings of The Twenty Fourth Annual Hawaii International Conference on System Sciences; vol. 1.* Los Alamitos, CA: IEEE Computer Society Press. Jan. 1991; 595-604
17. **Hunter, L., Harris, N. & States, DJ.** Megaclassification: Discovering Motifs in Massive Datastreams, *Proceedings of the Tenth National Conference on Artificial Intelligence*, pp. 837-842, 1992, AAAI Press, Menlo Park, CA.
18. **Hunter, L., Harris, N. & States, DJ.** Efficient Classification of Massive, Unsegmented Datastreams, *Proceedings of the Ninth International Workshop on Machine Learning*, pp. 224-233, 1992, Morgan Kaufmann Associates, San Mateo, CA.
19. **Hunter, L. & States, DJ.,** Bayesian Classification of Protein Structure, *IEEE Expert*, 7(4):67-75, 1992.
20. **Hunter, L.** Knowledge Acquisition Planning: Using Multiple Sources of Knowledge to Answer Questions in Biomedicine, *Mathematical and Computer Modeling*, 16(6/7):79-91, 1992.
21. **Hunter, L. & Ram, A.,** Goals for Learning and Understanding. *Journal of Applied Intelligence*. 2(1):47-73, 1992.
22. **Hunter, L.** AI and Grand Challenges in Biotechnology Computing, *Proceedings of the 13th International Joint Conference on Artificial Intelligence*, Morgan Kaufman, San Mateo, CA, Vol. 2, pp. 1677-1683, 1993.
23. Harris, N., **Hunter, L. & States, DJ.** ClassX: A Tool for Browsing Protein Sequence Megaclassifications, *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences*, vol. 1, Los Alamitos, CA: IEEE Computer Society Press, Jan 1993; pp 554-563.
24. **Hunter, L. & Klein, T.** Finding Relevant Biomolecular Features, in Hunter, et al., (eds). *Proceedings of the First International Conference on Intelligent*

- Systems for Molecular Biology*, AAAI Press, Menlo Park CA, 1993, pp. 190-197.
25. States, DJ, Harris, N., **Hunter, L.** Computationally Efficient Cluster Representation in Molecular Sequence Megaclassification, in Hunter, et al (eds). *Proceedings of the First International Conference on Intelligent Systems for Molecular Biology*, AAAI Press, Menlo Park CA, 1993, pp. 387-394.
  26. Dowe, D., Allison, L., Dix, T., **Hunter, L.**, Wallace, CS., & Edgoose, T., Circular Clustering of Protein Dihedral Angles by Minimum Message Length, *Pacific Symposium on Biocomputing* (1):242-255. World Scientific Press, 1996.
  27. **Hunter, L.** Coevolution Learning: Synergistic Evolution of Learning Agents and Problem Representations, *Proceedings of 1996 Multistrategy Learning Conference*, pp. 85-94, Menlo Park, CA: AAAI Press, 1996.
  28. Abramson. M. Z. and **Hunter, L.** Classification using Cultural Coevolution and Genetic Programming. *Genetic Programming: Proc. of the First Annual Conf.* 1996, pp. 249-254, MIT Press, 1996
  29. Krichmar, JL, Olds, JL. & **Hunter, L.** Qualitative Neurobiology, *Proceedings of the 1997 Workshop on Qualitative Reasoning*, pp. 265-276, 1997
  30. Krichmar, JL, Ascoli, G.A., Olds, J.L. and **Hunter, L.** A model of cerebellar saccadic motor learning using qualitative reasoning, *Biological and Artificial Computation: From Neuroscience to Technology* 1240: 133-145 (1997)
  31. Shah, I. & **Hunter, L.** Functional Classification of Enzymes by Sequence Alignment, *Intelligent Systems for Molecular Biology*, 5:276-83 , Menlo Park, CA: AAAI Press 1997
  32. Zeeberg, B.R. & **Hunter, L.** A Hidden Markov Model Whose Alphabet Is Nucleic Acid Triplet Codons and its Use to Discover Chimerism in Protein Families, *Intelligent Systems for Molecular Biology* 5:153-156 , Menlo Park, CA: AAAI Press, 1997
  33. Zeeberg, B.R. & **Hunter, L.** Characterization of a Family of Chimeric Proteins, the Amino Acyl tRNA Synthetases, by Determining Differential Codon Usage using One and Two State HMMs. *Mathematical Modeling and Scientific Computation*, 9(1):58-67, 1998.
  34. Shah, I. & **Hunter, L.** Visualization Based on the Enzyme Commission Nomenclature. *Pacific Symposium on Biocomputing* 3:142-152 (1998).
  35. Shah, I. & **Hunter, L.** Identification of divergent functions in homologous proteins by induction over conserved modules. *Intelligent Systems for Molecular Biology* 6:157-64 (1998)
  36. Tanabe L, Scherf U, Smith LH, Lee JK, **Hunter L**, Weinstein JN., MedMiner: an Internet text-mining tool for biomedical information, with application to gene expression profiling. *Biotechniques*. 1999 Dec;27(6):1210-4, 1216-7.
  37. Tanabe, L., Rindfleisch, T.C., Weinstein, J.N., **Hunter, L.**, Edgar: Extraction of Drugs, Genes and Relations from the Biomedical Literature, *Pacific Symposium on Biocomputing*, 5:514-525, 2000

38. Shah, I. & **Hunter, L.** Visual Management of Large Scale Data Mining Projects., *Pacific Symp. on Biocomputing*, 5:275-287, 2000
39. **Hunter, L.**, Taylor, R., Leach, S., & Simon, R., GEST: A Gene Expression Search Tool Based on a Novel Bayesian Similarity Metric, *Bioinformatics*. 2001 Jun;17 Suppl 1:S115-S122.
40. Edgerton, ME, Taylor, R., Powell, JI., **Hunter, L.**, Simon, R., and Liu, E., A Bioinformatics Tool to Mine Sequences for Microarray Studies of Mouse Models of Oncogenesis, *Bioinformatics*, 18(5):774-775. 2002
41. Cohen, K.B., Dolbey, A., Acquaaah-Mensah, G. and **Hunter, L.** Contrast and variability in gene names *Proceedings of the Workshop on Natural Language Processing in the Biomedical Domain*, Philadelphia, July 2002, pp. 14-20 Association for Computational Linguistics.
42. **Hunter, L.** Ontologies for Programs, Not People. *Genome Biology* 2002, 3(6):interactions1002.1-1002
43. Phang, T.L, Neville, M.C., Rudolph, M. and **Hunter, L.** Trajectory clustering: A non-parametric method for grouping gene expression time courses, with applications to mammary development., *Pacific Symposium on Biocomputing* 2003, 8:351-362.
44. Brown, E.B., Dolbey, A., **Hunter, L.** IBM Research and the University of Colorado TREC 2003 Genomics Track. *Proceedings of the Twelfth Text Retrieval Conference (TREC 2003)*:pp. 268-275, National Institute of Standards and Technology.
45. Shenkar, R., Elliott, J.P., Diener, K., Gault, J., Hu, L.J., Cohrs, R.J., Phang, T., **Hunter, L.**, Breeze, R.E., and Awad, I.A., Gene Expression in Human Cerebral Vascular Malformations, *Neurosurgery*, 52(2):465-478 2003
46. Witzmann, F., Li, J., Strother, W. McBride, W., **Hunter, L.**, Crabb, D., Lumeng, L., Li, T.K. Innate Differences in Protein Expression in the Nucleus Accumbens and Hippocampus of Inbred Alcohol-Preferring and -Nonpreferring Rats. *Proteomics* 2003 Jul;3(7):1335-44.
47. Rudolph, M., McManaman, J., **Hunter, L.**, Phang, T, Neville, M Initiation of Lactation in the Murine Mammary Gland: Temporal analysis of a complex biological switch with expression profiling and trajectory clustering. *J Mammary Gland Biol Neoplasia*. 2003 Jul;8(3):287-307
48. Ogren, P.V., Cohen, K.B. , Acquaaah-Mensah, G.K., Eberlein, J. **Hunter, L.** The Compositional Structure of Gene Ontology Terms *Pacific Symposium on Biocomputing* 2004, 9:214-225
49. **Hunter, L.** Life and Its Molecules: A Brief Introduction, *AI Magazine*, 25(1): 9-22, Spring 2004
50. Hong, M., Kairmpour-Fard, A., Russell, S. and **Hunter, L.**, Integrated Term Weighting, Visualization, and User Interface Development for Bioinformation Retrieval. *AI, Simulation and Planning in Highly Autonomous Systems Conference (AIS 2004)*. Reprinted in *Springer-Verlag Lecture Notes in Computer Science* 3397: 673-682 (2005)

51. Russell, S.A., Old, W., Resing, K.A. and **Hunter, L.** Proteomic Informatics, *International Review of Neurobiology*, 61:129-157, 2004
52. Lu, Z. and **Hunter, L.** GO Molecular Function Terms are Predictive of Subcellular Localization, *Pacific Symposium on Biocomputing* 2005 10:151-161
53. Ogren, P., Cohen, K.B. and **Hunter, L.** Implications of compositionality in the gene ontology for its curation and usage, *Pacific Symposium on Biocomputing* 2005, 10:174-185
54. Kinoshita, S., Cohen K.B., Ogren, P.V., **Hunter, L.** BioCreAtIvE Task1A: Entity Identification with a Stochastic Tagger. *BMC Bioinformatics* 2005, 6(Suppl 1):S4 (24 May 2005).
55. Coors, ME. **Hunter, L.** Evaluation of Genetic Enhancement: Will Human Wisdom Properly Acknowledge the Value of Evolution? *American Journal of Bioethics*, 2005 Summer;5(3):21-2; discussion W4-9.
56. Cohen, KB, Fox, LM, Ogren, PV & **Hunter, L.** Corpus design for biomedical natural language processing. *Proc. Of the ACL-ISMB workshop Linking Biological Literature, Ontologies and Databases: Mining Biological Semantics* pp. 38-45, Association for Computational Linguistics. June 2005
57. Hu, X., Friedman, D., Hill, S., Caprioli, R., Kobilka, B, **Hunter, L.**, Limbird, L. Proteomic Exploration of Pancreatic Islets in Mice Null for the  $\alpha_2A$  adrenergic receptor. *J. Mol. Endocrin.*, 2005 Aug 35(1):73-88.
58. Cohen, KB, Fox, LM., Ogren PV, **Hunter, L.** Empirical data on corpus design and usage in biomedical natural language processing, *Proc. Am. Medical Informatics Assoc.* Pp. 156-160, 2005
59. Caporaso, JG, Baumgartner WA., Cohen KB, Johnson, HL, Paquette J., and **Hunter, L.** Concept recognition and the TREC Genomics tasks. In: *The Fourteenth Text REtrieval Conference Proceedings*, 2005.
60. Lu, Z. Cohen, KB, **Hunter L.** Finding GeneRIFs via Gene Ontology Annotations, *Pacific Symposium on Biocomputing* 2006 11:52-63
61. Johnson, HL, Cohen, KB, Baumgartner, WA, Lu, Z, Bada, M, Kester, T, Kim, H, **Hunter L.** Evaluation of Lexical Methods for Detecting Relationships Between Concepts from Multiple Ontologies, *Pacific Symposium on Biocomputing* 2006 11:28-39
62. Johnson, HL, Baumgartner WA., Krallinger, M, Cohen KB, **Hunter L.** Refactoring Corpora *Proceedings of the HLT-NAACL BioNLP Workshop on Linking Natural Language and Biology* June 2006, pp. 116-117 <http://www.aclweb.org/anthology/W/W06/W06-1720>
63. **Hunter, L.** Cohen, KB Biomedical Language Processing: What's Beyond PubMed? *Molecular Cell* 21(5):589-594 March 3, 2006.
64. Lowes BD, Zolty R, Minobe WA, Robertson AD, Leach S, **Hunter L.** Bristow MR . Serial gene expression profiling in the intact human heart, *Journal Of Heart And Lung Transplantation* 25 (5): 579-588 May 2006

65. Bada, M and **Hunter, L**. Enrichment of OBO Ontologies. *Journal of Biomedical Informatics* Informatics 2006 Jul 26; 40(3):300-15
66. Cohen, KB and **Hunter, L** A critical review of PASBio's argument structures for biomedical verbs *BMC Bioinformatics* 2006, 7(Suppl 3):S5
67. Guzelian J, Barwick JL, **Hunter L**, Phang TL, Quattrochi LC, Guzelian PS. Identification of genes controlled by the pregnane X receptor by microarray analysis of mRNAs from pregnenolone 16alpha-carbonitrile-treated rats. *Toxicol Sci.* 2006 Dec;94(2):379-87.
68. Lu, Z, Cohen, KB and **Hunter, L**. Generif Quality Assurance As Summary Revision *Pacific Symposuim on Biocomputing* 2007: 269-280
69. Leach, SM, Gabow, A, **Hunter, L**. and Goldberg, D. Assessing And Combining Reliability Of Protein Interaction Sources. *Pacific Symposuim on Biocomputing*, 2007: 433-444
70. Johnson, HL, Cohen KB and **Hunter, L**. A Fault Model For Ontology Alignment And Mapping Systems. *Pacific Symposuim on Biocomputing* 2007: 233-244
71. Serkova, NJ, Zhang Y, Coatney JL, **Hunter L**, Wachs ME, Niemann CU, Mandell MS. Early Detection of Graft Failure Using the Blood Metabolic Profile of a Liver Recipient. *Transplantation* 2007 Feb 27;83(4):517-21.
72. Baumgartner WA Jr., Lu, Z., Johnson, HL., Caporaso, JG., Paquette, J, Lindemann, A., White, EK., Medvedeva, O., Cohen, KB., **Hunter, L.**, An integrated approach to concept recognition in biomedical text, *Proceedings of the BioCreative II Challenge Workshop*, April 2007
73. Baumgartner WA Jr, Cohen KB, Fox LM, Acquaaah-Mensah G, **Hunter L**. Manual curation is not sufficient for annotation of genomic databases. *Bioinformatics*. 2007 Jul 1;23(13):i41-8. [Reprinted in the International Medical Informatics Association's *Yearbook of Medical Informatics* 2008.]
74. Caporaso JG, Baumgartner WA Jr, Randolph DA, Cohen KB, **Hunter L**. MutationFinder: a high-performance system for extracting point mutation mentions from text. *Bioinformatics*. 2007 Jul 15;23(14):1862-5
75. Bhave SV, Hornbaker C, Phang TL, Saba L, Lapadat R, Kechris K, Gaydos J, McGoldrick D, Dolbey A, Leach S, Soriano B, Ellington A, Ellington E, Jones K, Mangion J, Belknap JK, Williams RW, **Hunter LE**, Hoffman PL, Tabakoff B. The PhenoGen Informatics website: tools for analyses of complex traits. *BMC Genet.* 2007 Aug 30;8(1):59 <http://www.biomedcentral.com/1471-2156/8/59>
76. Johnson, HL, Baumgartner, WA. Jr., Krallinger, M., Cohen, KB, **Hunter, L.**, Corpus Refactoring: A Feasibility Study. *Journal of Biomedical Discovery and Collaboration* 2007, 2:4 (13 September 2007). <http://www.j-biomed-discovery.com/content/2/1/4>
77. Karimpour-Fard, A., Detweiler, CS., Erickson, KD, **Hunter, L.**, Gill, RT., Cross-Species Cluster Co-Conservation: A new method for generating protein interaction networks. *Genome Biology* 8(9):R185 (September 2007)
78. Karimpour-Fard A, **Hunter L**, Gill RT. Investigation of factors affecting prediction of protein-protein interaction networks by phylogenetic profiling. *BMC*

- Genomics*. 2007 Oct 29;8(1):393
79. Caporaso, JG, Baumgartner, WA Jr., Randolf, DA, Cohen, KB, **Hunter, L.** Rapid Pattern Development for Concept Recognition Systems: Applications to Point Mutations, *Journal of Bioinformatics and Computational Biology*. 2007 Dec;5(6):1233-59
  80. Glueck, D, Muller, KE, Karimpour-Fard, A, **Hunter, L.**, Expected Power for the False Discovery Rate with Independence. *Communications in Statistics - Theory and Methods*, Volume 37, Issue 12 January 2008 , pages 1855 - 1866.
  81. Baumgartner WA Jr., Cohen, KB and **Hunter, L.** An open-source framework for large-scale, flexible evaluation of biomedical text mining systems. *Journal of Biomedical Discovery and Collaboration*. 2008, 3:1 doi:10.1186/1747-5333-3-1
  82. Cohen, KB & **Hunter, L.** Getting started in text mining, *PLoS Computational Biology*, 2008 4(1): e20. doi:10.1371/journal.pcbi.0040020.
  83. Caporaso, JG, Deshpande, N, Fink, JL, Bourne, PE, Kohen, KB, **Hunter, L.** Intrinsic evaluation of text mining tools may not predict performance on realistic tasks. *Pacific Symposium on Biocomputing*, 13:640-651(2008)
  84. Baumgartner WA Jr., Lu, Z., Johnson, HL., Caporaso, JG., Paquette, J, Lindemann, A., White, EK., Medvedeva, O., Cohen, KB., **Hunter, L.**, Concept Recognition for Extracting Protein Interactions from Biomedical Text, *Genome Biology*, 2008, 9 (Suppl 2):S9
  85. Leitner, F, Krallinger, M, Rodriguez-Penagos, C., Hakenberg, J., Plake, C., Kuo, C-J., Hsu, C-N, Tsai, R.T-H., Hung, H-C., Lau, W.W., Johnson, C.A., Saetre, R., Yoshida, K., Chen, Y.H., Kim, S., Shin, S-Y., Zhang, B-T., Baumgartner, W.A. Jr., **Hunter, L.** Haddow, B., Matthews, M., Wang, X., Ruch, P., Ehrler, F., Ozgur, Z., Erkan, G., Radev, D.R., Krauthammer, M., Luong, T.B., Hoffman, R., Sander, C., Valencia, A., Introducing Meta-Services for Biomedical Information Extraction. *Genome Biology*, 2008, 9(Suppl 2):S6.
  86. **Hunter, L.**, Lu, Z., Firby, J., Baumgartner, WA. Jr., Johnson, HL, Ogren, PV, Cohen, KB, OpenDMAP: An open-source, ontology-driven concept analysis engine, with applications to capturing knowledge regarding protein transport, protein interactions and cell-specific gene expression. *BMC Bioinformatics*, 2008 Jan 31;9(1):78.
  87. Harvell DM, Spoelstra NS, Singh M, McManaman JL, Finlayson C, Phang T, Trapp S, **Hunter L**, Dye WW, Borges VF, Elias A, Horwitz KB, Richer JK. Molecular signatures of neoadjuvant endocrine therapy for breast cancer: characteristics of response or intrinsic resistance. *Breast Cancer Res Treat*. 2008 Dec;112(3):475-88.
  88. Gabow, AP, Leach SM, Baumgartner, WA Jr., **Hunter, L.**, Goldberg, DS. Improving Protein Function Prediction methods with Integrated Literature Data. *BMC Bioinformatics*, 2008 9:198.
  89. Bethard, S., Lu, Z., Martin, JH., **Hunter L.** Semantic Role Labeling for Protein Transport Predicates. *BMC Bioinformatics*, 2008, 9:277.

90. Bada, M., **Hunter, L.**, Identification of OBO Nonalignments and Its Implications for OBO Enrichment, *Bioinformatics*, 2008 24(12):1448-1455.
91. Glueck, DH., Mandel, J., Karimpour-Fard, A., **Hunter, L.**, Muller, KE. Exact Calculations of Average Power for the Benjamini-Hochberg Procedure, *The International Journal of Biostatistics*, 2008 4(1):11.
92. Glueck, DH., Karimpour-Fard, A., Mandel, J., **Hunter, L.**, Muller, KE. Fast computation by block permanents of cumulative distribution functions of order statistics from several populations. *Communications in Statistics - Theory and Methods*, 37(18):2815-2824 January 2008.
93. Karimpour-Fard, A., Leach, SM, **Hunter, L.**, Gill, R. The topology of the bacterial co-conserved protein network and its implications for predicting protein function, *BMC Genomics*, 2008, 9:313.
94. Cohen KB, Palmer M, **Hunter L** Nominalization and Alternations in Biomedical Language. *PLoS ONE* 2008 3(9): e3158 doi:10.1371/journal.pone.0003158
95. Karimpour-Fard, A., Leach, S.M., Gill, R.T., **Hunter, L.** Predicting Protein Linkages in Bacteria: Which Method is Best Depends on Task. *BMC Bioinformatics* 2008, 9:397 doi:10.1186/1471-2105-9-397
96. Baumgartner WA Jr, Lu Z, Johnson HL, Caporaso JG, Paquette J, Lindemann A, White EK, Medvedeva O, Cohen KB, **Hunter L.** Concept recognition for extracting protein interaction relations from biomedical text. *Genome Biol.* 2008;9 Suppl 2:S9. Epub 2008 Sep 1.
97. Yen CY, Meyer-Arendt K, Eichelberger B, Sun S, Houel S, Old WM, Knight R, Ahn NG, **Hunter LE**, Resing KA. A simulated MS/MS library for spectrum-to-spectrum searching in large-scale identification of proteins. *Mol Cell Proteomics.* 2008 Dec 22.
98. Caporaso, JG, Smit, S., Easton, BC, **Hunter, L.**, Huttley, GA., Knight, R. Detecting coevolution without phylogenetic trees? Tree-ignorant metrics of coevolution perform as well as tree-aware metrics. *BMC Evolutionary Biology*, 2008 Dec 3;8(1):327.
99. Tipney, HJ, Leach, SM, Feng, W., Spritz, R., Williams, T., **Hunter, L.** Leveraging existing biological knowledge in the identification of candidate genes for facial dysmorphology. *BMC Bioinformatics* 2009, 10(Suppl 2):S12
100. Leach, SM, Tipney, H, Feng, W., Baumgartner, W Jr., Kasliwal, P., Schuyler, R., Williams, T, Spritz, R., **Hunter, L.** Biomedical Discovery Acceleration, with Applications to Craniofacial Development. *PLoS Computational Biology*, 5(3): e1000215. 2009
101. Tamburini, BA, Trapp, S, Phang, TL, Schappa, JT, **Hunter, L.**, Modiano, JF. Gene Expression Profiles of Sporadic Canine Hemangiosarcomas are Uniquely Associated with Breed. *PLoS One* 4(5): e5549. 2009
102. Verspoor, K., Dvorkin D., Cohen, KB., **Hunter, L.** Ontology Quality Assurance through analysis of term transformations. *Bioinformatics* 2009 June 15; 25(12):177-84
103. Kano, Y., Baumgartner, WA Jr., McCrohon, L, Ananiadou, S., Cohen, KB,

- Hunter, L.,** Tsujii, J. U-Compare: share and compare text mining tools with UIMA. *Bioinformatics*, 2009 Aug 1 25(15):1997-8
104. Cohen, KB., Verspoor, K., Johnson, HL., Roeder, C., Ogren, PV., Baumgartner, WA. Jr., White, E., Tipney, H., **Hunter, L.** High-precision biological event extraction with a concept recognizer. *Proceedings of the Workshop on BioNLP: Shared Task*, pp 50-58, Association for Computational Linguistics.  
<http://aclweb.org/anthology-new/W/W09/W09-1407.pdf>
105. Verspoor, K., Cohen, KN., Hunter, L. Textual characteristics of traditional and Open Access scientific journals are similar, *BMC Bioinformatics* 2009, 10:183.

#### Books

106. Editor, *Artificial Intelligence and Molecular Biology*, AAAI/MIT Press, 1993.  
Now available free online <http://www.aaai.org/AITopics/classic/hunter.html>
107. *The Processes of Life*, MIT Press, 2009.

#### Proceedings Volumes Edited:

108. **Hunter, L.,** Mudge, T., Milutinovic, V. (eds) *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences*, vol. 1: Computer Architecture and Biotechnology Computing, Los Alamitos, CA: IEEE Computer Society Press, Jan 1993
109. **Hunter, L.,** Shavlik, J. & Searls, DB (eds) *Proceedings of the First International Conference on Intelligent Systems for Molecular Biology*, Menlo Park, CA: AAAI Press, July 1993
110. **Hunter, L.,** (ed) *Twenty-Seventh Annual Hawaii International Conference on System Sciences*, vol. 5: Biotechnology Computing, Los Alamitos, CA: IEEE Computer Society Press, Jan 1994
111. Rawlings, C., Clark, D., Altman, RB, **Hunter, L.,** Lengauer, T., Wodak, S., (eds) *Proceedings of the Third International Conference on Intelligent Systems for Molecular Biology*, Menlo Park, CA: AAAI Press, July 1995
112. States, DJ, Agarwal, P., Gaasterland, T. **Hunter, L.,** Smith, R. (eds) *Proceedings of the Fourth International Conference on Intelligent Systems for Molecular Biology*, Menlo Park, CA: AAAI Press, July 1996
113. **Hunter, L.,** Klein TE, (eds) *Pacific Symposium on Biocomputing '96*, Singapore: World Scientific Press, January 1996.
114. Altman, RB, Dunker AK, **Hunter, L.,** Klein TE, (eds) *Pacific Symposium on Biocomputing '97*, Singapore: World Scientific Press, January 1997.
115. Altman, RB, Dunker AK, **Hunter, L.,** Klein TE, (eds) *Pacific Symposium on Biocomputing '98*, Singapore: World Scientific Press, January 1998.
116. Altman, RB, Dunker AK, **Hunter, L.,** Klein TE, (eds) *Pacific Symposium on Biocomputing '99*, Singapore: World Scientific Press, January 1999.
117. Altman, RB, Dunker AK, **Hunter, L.,** Klein TE, (eds) *Pacific Symposium on Biocomputing '00*, Singapore: World Scientific Press, January 2000

118. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '01*, Singapore: World Scientific Press, January 2001
119. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '02*, Singapore: World Scientific Press, January 2002
120. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '03*, Singapore: World Scientific Press, January 2003
121. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '04*, Singapore: World Scientific Press, January 2004
122. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '05*, Singapore: World Scientific Press, January 2005
123. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '06*, Singapore: World Scientific Press, January 2006
124. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '07*, Singapore: World Scientific Press, January 2007
125. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '08*, Singapore: World Scientific Press, January 2008
126. Altman, RB, Dunker AK, **Hunter, L.**, Klein TE, (eds) *Pacific Symposium on Biocomputing '09*, Singapore: World Scientific Press, January 2009

Book Chapters:

127. **Hunter, L.** An Introduction to Molecular Biology for the Computer Scientist, in *Artificial Intelligence and Molecular Biology*, L. Hunter, ed., AAI Press, 1993.
128. **Hunter, L.** Planning to Learn About Protein Structure, in *Artificial Intelligence and Molecular Biology*, L. Hunter, ed., AAI Press, 1993.
129. **Hunter, L.** Classifying for Prediction: A Multistrategy Approach to Predicting Protein Structure, in *Machine Learning IV*, ed. by R. Michalski & G. Tegucci, Morgan Kaufmann, 1994.
130. **Hunter, L.**, Ram, A., The Use of Explicit Goals for Knowledge to Guide Inference and Learning, in *Goal-Driven Learning*, ed. by Ashwin Ram and David B. Leake, MIT Press, 1995.
131. **Hunter, L.**, Planning to Learn, in *Goal-Driven Learning*, ed. by Ashwin Ram and David B. Leake, MIT Press, 1995.
132. Krichmar, JL, Ascoli, GA, **Hunter, L.**, Olds, JL. The Qualitative Reasoning Neuron: A New Approach to Modeling in Computational Neuroscience, in *Computational Neuroscience*, James Bower (ed), Plenum Press, NY. 1998
133. **Hunter, L.** & Rule, JB. A New Personal Right for the Information Age, in *Visions for Privacy*, Collin Bennett and Rebecca Grant (eds.) University of Toronto Press, 1999.
134. **Hunter, L.** & Cohen, K.B. Natural Language Processing for Systems Biology, in *Artificial Intelligence Methods and Tools for Systems Biology* W. Dubitzky & F. Azuaje (eds). Springer 2004

135. Russell, S., Old, W., Resing, K. & **Hunter, L.** Proteomic Informatics, in *Human Brain Proteomics*, L. Neuhold (ed). Elsevier, 2004.
136. Kim, H, Kechris, KJ, **Hunter, L** Mining Discriminative Distance Context of Transcription Factor Binding Sites on ChIP Enriched Regions in *Bioinformatics Research and Applications*, Pan, Y, Narasimhan G, Lu, S, Harrison, RW (eds). Springer 2007
137. Saba, L.M., Hoffman, P.L., **Hunter, L.** and Tabakoff, B. The Marriage of Phenomics and Genetical/Genomics: A Systems Approach to Complex Trait Analysis, in *Systems Biology and Psychiatry: New frontiers in psychobiological understanding of mental disorders*. Tretter, F., Gebicke-Haerter, P.J., Winterer, G., Mendoza, E. (eds). Wiley, 2009

Invited or Unreviewed Publications:

138. **Hunter, L.**, Schank, RC, The Quest to Understand Thinking. *Byte*, 10(4):143-155, April 1985.
139. **Hunter, L.**, Review of Stewart Brand's *The Media Lab*. in *The New York Times Book Review*, Sept. 27, 1987, p. 38
140. **Hunter, L.**, AI Attitudes and Techniques in Computer Supported Collaborative Work. *New Science: AI Research*, Aug. 15, 1988, p. 765
141. **Hunter, L.**, AI Techniques: Temporal Reasoning. *New Science: AI Research*, July 4, 1988, p. 719.
142. **Hunter, L.**, Review of Winograd and Flores *Understanding Computers and Cognition*. in *Technology Review*, July 1988
143. **Hunter, L.**, AI Techniques: Analogical Reasoning. *New Science: AI Research*, June 20, 1988, p.709.
144. **Hunter, L.** *Industrial Applications of Machine Learning*, New Science AI Industry Report, June 1989
145. **Hunter, L.**, ARRIS: Searching for Drugs With AI Software *New Science: AI Research*, June 18, 1990, p. 1464
146. **Hunter, L.** Artificial Intelligence and Molecular Biology: Extended abstract of invited address, *Proceedings of the Tenth National Conference on Artificial Intelligence*, pp. 866-868, 1992, AAAI Press, Menlo Park, CA.
147. **Hunter, L.** Review of Steven Levy's *Artificial Life* in *IEEE Spectrum* May 1993, 30(5):11-12.
148. B. Grosz, R. Davis, R. Bajcsy, P. Bonisone, B. Bullock, S. Minton, T. Mitchell, R. Perrault, T. Lozano-Perez, **L. Hunter**, M. Pollack, P. Rosenbloom, S. Shieber, H. Strobe D. Weld, A Report to ARPA on Twenty-First Century Intelligent Systems, AAAI Press, Menlo Park, 1994
149. **Hunter, L.** Public Image: Privacy in the Information Age. *Whole Earth Review*, 44:32-37, January 1985. Reprinted in *Social Issues Resource Services: Privacy, Volume 3*, 1986. Also reprinted in *The Borzoi College Reader*, eds. Charles

- Muscatine & Marlene Griffith, 7th edition, McGraw Hill, NY, 1992. Also reprinted in *Computers, Ethics and Social Values*, Deborah Johnson & Helen Nissenbaum, Prentice Hall, 1995.
150. **Hunter, L.**, Shavlik, J, Searls, DB. Conference Report: The First International Conference on Intelligent Systems for Molecular Biology, *AI Magazine* 15(1):12-13, 1994
  151. **Hunter, L.**, Shavlik, J, Searls, DB. Introduction to the Special Issue on Molecular Biology Applications, *Machine Learning*, 21: (1-2) 5-9 Oct-Nov 1995
  152. **Hunter, L.**, The State of Biotechnology Computing, 1994, *Proceedings of the Hawaiian International Conference on System Sciences* IEEE Computer Science Press, vol. 5, pp vi-viii, 1995
  153. **Hunter, L.**, Review of *Computer: A History of the Information Machine* by Martin Campbell-Kelly and William Aspray. in *The New York Times Book Review*, Nov. 17, 1996
  154. **Hunter, L.**, Rule, JB. Privacy Wrongs, with James Rule. *The Washington Monthly*, November 1996.
  155. **Hunter, L.**, Review of *Trapped in the Net* by Gene Rochlin, in *The New York Times Book Review*, Sept. 7, 1997.
  156. **Hunter, L.**, Rawlings, CJ., Creating a Professional Society for Bioinformatics - The International Society for Computational Biology (ISCB), *Bioinformatics* 14: (6) 471-471 1998
  157. **Hunter, L.**, Review of *Howard Aiken: Portrait of a Computer Pioneer* by I. Bernard Cohen, in *The New York Times Book Review*, September 12, 1999.
  158. **Hunter, L.**, Lathrop, R.H. Computer science and biology: an unlikely pair [Guest Editorial Introduction] *IEEE Intelligent Systems* Mar/Apr 2002 17(2):8- 10
  159. **Hunter, L.**, Brown, E., Dolbey, A. *IBM Research and the University of Colorado TREC 2003 Genomics Track Report*. IBM technical report RC23056, 2004.
  160. **Hunter L**, Altman RB, Bourne PE. The international society for computational biology 10th anniversary. *PLoS Comput Biol*. 2007 Jun 29;3(6):e135.
  161. Smith L, *et al.*, Overview of BioCreative II gene mention recognition. *Genome Biol*. 2008;9 Suppl 2:S2. Epub 2008 Sep 1.
  162. Karp PD, Sherlock G, Gerlt JA, Sim I, Paulsen I, Babbitt PC, Laderoute K, **Hunter L**, Sternberg P, Wooley J, Bourne PE. Changes to NIH grant system may backfire. *Science*. 2008 Nov 21;322(5905):1187-8.

#### Software Systems and Databases

163. *OpenDMAP*: OpenDMAP is an ontology-driven, rule-based concept analysis and information extraction system. It had the best performance in protein-protein interaction task in BioCreative II global competition. Available as open source: <http://opendmap.sourceforge.net/>

164. *Knowtator*: Knowtator is a general-purpose text annotation tool that is integrated with the Protégé knowledge representation system. In use by several academic annotation projects. Available as open source: <http://knowtator.sourceforge.net/>
165. *Bio-UIMA component repository* The BioNLP Unstructured Information Management Architecture (UIMA) Component Repository provides UIMA wrappers for novel and well-known 3rd-party NLP tools used in biomedical text processing, such as tokenizers, parsers, named entity taggers, and tools for evaluation. Available as open source: <http://bionlp-uima.sourceforge.net/>
166. *MutationFinder*: an information extraction system for extracting descriptions of point mutations from free text. . Available as open source: <http://mutationfinder.sourceforge.net/>
167. *CL-Statistics* Common Lisp code for a variety of statistical calculations. Available as open source: <http://compbio.uchsc.edu/hunter/cl-statistics.lisp>
168. *COEV: A system for co-evolving learning agents and problem representations*. Common Lisp and C code that implements a form of cultural co-evolution for synergistic multistrategy machine learning. Patented and licensed by several major US corporations.
169. *Audio Knowledge Acquisition Tool*, with Chuck McMath. A Macintosh application for the management of large amounts of audio protocol data. Distributed by the US National Technical Information Service; used by knowledge engineers, psychologists, anthropologists and oral historians. No longer maintained.
170. *Amino Acid Representation Package*. Common Lisp code for implementing a wide variety of representations for amino acids, including the novel Atoms-Orbitals-Hydrogens (AOH) representation. Used by machine learning researchers for protein structure prediction and other tasks. No longer maintained.
171. *AI & Molecular Biology Researchers Database*. Database of names, contact information and research interests of more than 150 researchers worldwide. In 1995, the second most frequently accessed file in the European Molecular Biology Laboratory WAIS-server, widely used by students, academics and commercial organizations. No longer maintained.