

# CURRICULUM VITAE

(January 2008)

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## PERSONAL REFERENCES:

LAST NAME: Medrano-Soto  
FIRST NAME: Luis Arturo  
GENDER: Male  
CITIZENSHIP: Mexican  
TELEPHONE: (310) 206-3907  
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## CURRENT POSITION (Since September 2005):

Postdoctoral research fellow at the [Howard Hughes Medical Institute](#). I work with [Dr. David Eisenberg](#) at the [UCLA-DOE Institute for Genomics and Proteomics](#).

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## RESEARCH AREAS OF INTEREST:

Comparative genomics, functional genomics, structural genomics, lateral genomics, genome annotation, genetic-metabolic network analysis, molecular biology, transcriptional regulation, molecular evolution, computer science, Bayesian statistics, data mining and knowledge discovery in databases.

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## WORK EXPERIENCE:

Coordinator of the bioinformatics team involved in the development of the computational infrastructure for the analysis and annotation of the *Rhizobium etli* Genome. 2003-2005.

Research assistant at the [Center for Genomic Sciences](#) (CCG-UNAM) in the [Department of Computational Genomics](#). 2001-2003.

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**ACADEMIC QUALIFICATIONS:**

- **Doctorate:**  
GRADUATE PROGRAM: Ph. D. in Biomedical Sciences  
MAJOR: Computational Genomics  
INSTITUTION: [Center for Genomic Sciences \(UNAM\)](#)  
PERIOD: 1997-2005  
GLOBAL COURSE AVERAGE: (Not applicable to this Ph. D. program)
  
- **Master of Science degree:**  
GRADUATE PROGRAM: Master of Science in Electronics Engineering  
MAJOR: Computer Science  
INSTITUTION: Chihuahua's Institute of Technology ([ITCH](#))  
PERIOD: 1993-1996  
GLOBAL COURSE AVERAGE: 92.89/100
  
- **Undergraduate studies:**  
BACHELORS DEGREE: Industrial Engineering  
MAJOR: Electronics  
INSTITUTION: Chihuahua's Institute of Technology ([ITCH](#))  
PERIOD: 1989-1993  
GLOBAL COURSE AVERAGE: 88.74/100

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**LANGUAGES:**

Bilingual: Spanish-English.  
German: 70%

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**AWARDS:**

- Recipient of the Mexican [National System of Investigators](#) (SNI) Level I award. September 2006.
- Award for presenting one of the [best 10 posters](#), from among 500, at the international congress of Intelligent Systems for Molecular Biology ([ISMB 2002](#)) celebrated in Edmonton, Canada. August 3-8, 2002.
- Recipient of the Doctoral fellowship from the Graduate Studies General Coordination Office (DGEP) at the [National Autonomous University of Mexico](#). 1997-2001
- Recipient of the Doctoral fellowship from the Mexican National Council of Science and Technology ([CONACyT](#)). 1997-2001.

- Special Mention for the thesis developed during the Master of Science Graduate Program at the Chihuahua's Institute of Technology ([ITCH](#)). November 1997.
- 1996 [Chihuahua's award](#) in the technological area with the work entitled: Applying Software Engineering to the Genetic Code Analysis for the Development of Molecular Biology. This is a competitive award given annually by the [state](#) as an incentive for researchers.
- Best GPA of the Graduate Programs at [ITCH](#) for the 1993-1996 generation (including only the graduate programs). GPA: 92.89/100
- Second place in GPA for the generation 1993-1997 at [ITCH](#) during my graduate program (including both undergraduate and graduate programs). GPA: 92.89/100
- Recipient of the Master of Science academic fellowship from the National Council of Science and Technology ([CONACyT](#)). 1993-1996.

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### Societies:

- Member of the [International Society for computational Biology](#) (ISCB).

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### PEER REVIEWED LIST OF PUBLICATIONS (INCLUDING SUBMITTED PAPERS):

- **Medrano-Soto, A.** Pal, D. and Eisenberg, D. Increasing the Accuracy of Automated Protein Molecular Function Prediction: the Contribution of Functional Linkages. (Submitted)
- Gonzalez, V. Santamaria, RI. Bustos, P. Hernandez-Gonzalez, I. **Medrano-Soto, A.** Moreno-Hagelsieb, G. Chandra-Janga, S. Ramirez, MA. Jimenez-Jacinto, V. Collado-Vides, J. and Davila, G. [The Partitioned \*Rhizobium etli\* Genome: Genetic and Metabolic redundancy in seven interacting replicons.](#) (2006). *Proc Natl Acad Sci USA*. 103(10):3834-3839
- Guerrero, G. Peralta, H. Aguilar, A. Diaz, R. Villalobos, MA. **Medrano-Soto, A.** Mora, J. [Evolutionary, Structural, and Functional Relationships Revealed by Comparative Analysis of Syntenic Genes in Rhizobiales.](#) (2005). *BMC Evol Bio* 15:55
- Ramirez, M. Graham, MA. Blanco-Lopez, L. Silvente, S. **Medrano-Soto, A.** Blair, MW, Hernandez, G. Vance, CP, Lara, M. [Sequencing and Analysis of common bean ESTs. Building a Foundation for Functional Genomics.](#) (2005). *Plant Physiol* 137(4):1211-1127 (BY INVITATION).
- **Medrano-Soto, A.** Christen, JA. Collado-Vides, J. [BClass: A Bayesian approach based on mixture models for clustering and classification of heterogeneous biological data.](#) (2005). *Journal of Statistical Software*. 13(2):1-18 (BY INVITATION).

- **Medrano-Soto, A.** [On codon usage, translatability, expression levels and horizontal gene transfer: Have we over-interpreted our model organisms?](#) (2005). PhD Thesis. Dep. of Computational Genomics. Center for Genomic Sciences, UNAM. (Thesis in Spanish).
- **Medrano-Soto, A.** Moreno-Hagelsieb, G. Vinuesa, P. Christen, JA. Collado-Vides, J. [Successful lateral transfer requires codon usage compatibility between foreign genes and recipient genomes.](#) (2004). *Mol Biol Evol* 21(10):1884-1894
- Valderrama, B. Oliver, P. **Medrano-Soto, A.** Vazquez-Duhalt, R. [Evolutionary and structural diversity within fungal laccases.](#) (2003). *Antonie van Leeuwenhoek* 84:289-299.
- Gonzalez, V. Bustos, P. Ramirez-Romero, M. **Medrano-Soto, A.** Salgado, H. Hernandez-Gonzalez, I. Hernandez-Celis, C. Quintero, V. Moreno-Hagelsieb, G. Girard, L. Rodriguez, O. Flores, M. Cevallos, M. A. Collado-Vides, J. Romero, D. Davila, G. [The mosaic structure of Symbiotic plasmid of \*Rhizobium etli\* and its relation with other symbiotic genome compartments.](#) (2003). *Genome Biology* 4(6):R36
- Collado-Vides J. **Medrano-Soto A.** Tusie-Luna M.T. [With the finished human genome in hand, what next?](#) (2003) *Genome Biology* 4(7):328. (BY INVITATION)
- Collado-Vides, J. Moreno-Hagelsieb, G. **Medrano-Soto, A.** [Microbial Computational Genomics of Gene Regulation.](#) (2002). *Pure Appl Chem* 74(6):889-895
- Clemente-Salazar, M. Fuentes-Moor, A. **Medrano-Soto, A.** A bioinformatic system for DNA analysis. (1999). *Soluciones Avanzadas* 68:56-60. (Paper in Spanish)

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## CHAPTERS IN BOOKS:

- Collado-Vides, J. **Medrano-Soto, A.** [Computational Biology before, during, and after the genomes. In: Frontiers of biology at the beginning of the XXI century.](#) Module I: Genomics, Proteomics and Bioinformatics. (Ed. Francisco Bolivar Zapata) pp:155-168. EL COLEGIO NACIONAL press. 2003. ISBN: 970-640-208-X (Chapter in Spanish)
- Collado-Vides, J. Moreno-Hagelsieb, G. Perez-Rueda, E. Salgado H. Huerta, A.M. Gutierrez, R.M. Rosenblueth, D.A. Christen, A. Benitez-Bellon, E. **Medrano-Soto, A.** Gama-Castro, S. Santos-Zavaleta, A. Bonavides-Martinez, C. Diaz-Peredo, E. Sanchez-Solano, F. Millan, D.M. Genomics of Gene Regulation: The view from *Escherichia coli*. In: [Gene Regulation and Metabolism: Post-Genomic Computational Approaches.](#) (Eds. Hofstaedt R and Collado-Vides J) pp 103-128. MIT Press. 2002. ISBN: 0-262-03297-X

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**PEER REVIEWED PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS (ALL IN SPANISH):**

- **Medrano-Soto A.**, Clemente Salazar M. A., Ibanez Gonzalez J. L., Arevalo Gallegos S., Pacheco Loya J. Fuentes Moor A. Genetic Protein Synthesis Processes Simulation via Software. ELECTRO 96. Chihuahua Chih. October, 1996.
- **Medrano-Soto A.**, Clemente Salazar M. A., Ibanez Gonzalez J. L., Arevalo Gallegos S., Pacheco Loya J. Fuentes Moor A. Applying Software Engineering to DNA and RNA Nucleotide Sequence Analysis. III National Congress of Biotechnology. Chihuahua Chih. October, 1996.
- **Medrano-Soto A.**, Clemente Salazar M. A. A Transgenic Operation Simulator. VI Chihuahua's Research Meeting. Chihuahua Chih. December 1995.
- **Medrano-Soto A.**, Clemente Salazar M. A. A Database Design as input for a Transgenic Operation Simulator. ELECTRO 95. Chihuahua Chih. October 1995.
- **Medrano-Soto A.**, Clemente Salazar M. A. A Database Design to Handle Food Technology and Nutrition Research Information. IEEE REUNE 95. Aguascalientes Mex. October 1995.
- **Medrano-Soto A.**, Clemente Salazar M. A. Software Design for Food Technology and Nutrition Research. CIENTITECH No 1. Chihuahua Chih. June, 1995.

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**PEER REVIEWER FOR THE INTERNATIONAL SCIENTIFIC JOURNALS AND CONFERENCE PROCEEDINGS:**

- Trends in Genetics (<http://www.trends.com/tig/default.htm>).
- Nucleic Acids Research (<http://nar.oupjournals.org>).
- FEBS Letters (<http://www.febsletters.org>).
- Research in Microbiology (<http://www.sciencedirect.com/science/journal/09232508>).
- *In Silico* Biology (<http://www.bioinfo.de/isb>)
- Canadian Journal of Microbiology ([http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2\\_desc\\_e?cjm](http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_desc_e?cjm))
- Proceedings of the 2005 IEEE Computational Systems Bioinformatics Conference ([CSB'05](#)). August 2005. Stanford, CA, USA

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**ACADEMIC MEETINGS, TALKS, POSTERS, AND COURSES:**

- Poster: Integrated Center for Structure and Function Innovation (The ISFI). (in English) 2008 [Keystone Symposium on Structural Genomics and its Applications to Chemistry, Biology, and Medicine](#). Steamboat Springs, Colorado USA. January 6-11, 2008.

- Talk: ProKnow 2.0 The Contribution of Functional Linkages to Molecular Function Prediction. (in English) ISFI Conference 2007. Los Angeles, California, USA. September 16-17, 2007. (BY INVITATION)
- Talk: Computational Genomics: current challenges and its contribution to biological knowledge discovery. (in Spanish) [CICESE](#). Ensenada, Baja California, Mexico. March 17, 2007. (BY INVITATION)
- Talk: How to Annotate a Bacterial Genome. UCLA-Mexico video-conference to support the [undergraduate program in Genomic Sciences](#) at the [Center for Genomic Sciences](#). November 14, 2006. Cuernavaca, Mexico. (BY INVITATION)
- Talk: ProKnow with ProLinks: an enhanced structure-to-function metaserver. ISFI Conference 2006. [University of Virginia](#). October 1-2, 2006. Charlottesville, VA. USA.
- Poster: Investigating the contribution of Functional linkages to protein function prediction. Symposium: Basic Research in Support of World Energy Needs. [UCLA-DOE Institute for Genomics and Proteomics](#). September 6, 2006. Los Angeles, California. USA.
- Poster: ProKnow 2.0: assessing the contribution of functional linkages to function prediction. [Automated Function Prediction 2006](#) (AFP2006). August 30-September 1, 2006. San Diego, California. USA.
- Talk: [The Challenge of knowledge Discovery in Genomic Sciences](#). (in English). IEEE EL Paso Section. University of Texas at El Paso. November 18, 2005. El Paso, Texas. USA (BY INVITATION).
- Talk: [Challenging the Compositional Paradigm in Horizontal Gene Transfer Prediction: a comparative genomics approach](#). (in English). University of Texas at El Paso. November 18, 2005. El Paso, Texas. USA (BY INVITATION).
- Attendee: ISFI Conference 2005. October 1-2, 2005. Los Alamos, New Mexico. USA.
- Talk: Successful horizontal gene transfer requires codon usage compatibility between foreign genes and recipient genomes. (in English). [UCLA-DOE Institute for genomics and proteomics](#). July 13-14, 2005. Los Angeles, CA. USA. (BY INVITATION)
- Talk: Applying Comparative Genomics for challenging the compositional paradigm in recent horizontal gene transfer detection. (in Spanish). XXVIII National Congress of Clinic Chemistry. March 7-9, 2005. Mexico City. (BY INVITATION)
- Poster: Victor Gonzalez, Patricia Bustos, Rosa I. Santamaria, Ismael L. Hernandez-Gonzalez, **Arturo Medrano-Soto**, Sarath Chandra, Gabriel Moreno-Hagelsieb, Miguel A. Ramirez, Rosa E. Gomez, Jose L. Fernandez, Julio Collado-Vides, and Guillermo Davila. The complete genome sequence of *Rhizobium etli*. [6<sup>th</sup> European Nitrogen Fixation Conference](#). July 24-27, 2004. Toulouse, France.

- Poster: Successful Lateral transfer requires codon usage compatibility between foreign genes and recipient genomes. [Fourth International Workshop on Bioinformatics and Systems Biology](#). May 31-June 3 2004. Kyoto, Japan.
- Completed course: Advanced Systems Administration in Solaris 9. Sun Microsystems CO. November 24-28, 2003. Cuernavaca, Morelos. Mexico.
- Talk: Computational Biology (in Spanish). Facultad de estudios superiores Zaragoza. June 27, 2003. Cuernavaca, Morelos. Mexico (BY INVITATION).
- Poster: Successful horizontal gene transfer requires codon usage compatibility between genomes. Human Genome Meeting 2003 ([HGM2003](#)), Cancun. Mexico. April 27-30.
- Poster: Rafael Diaz, Miguel Angel Villalobos, **Arturo Medrano-Soto**, Sergio Encarnacion, Jaime Mora. Comparative Genomics of Rhizobiaceae. [HGM2003](#), April 27-30 2003. Cancun. Mexico.
- Poster: Victor Gonzalez. Miguel A. Ramirez-Romero, Patricia Bustos, Rosa I. Santamaria. Ismael Hernandez-Gonzalez, Carmen Castaneda, Rosa E. Gomez. Jose A. Martinez, Jose L. Fernandez, **Arturo Medrano-Soto**, Gabriel Moreno-Hagelsieb, Heladia Salgado, Julio Collado-Vides, Guillermo Davila. The *Rhizobium etli* genome project: a model for plant-bacteria interaction. [HGM2003](#), April 27-30 2003. Cancun. Mexico.
- Talk: BClass, self-organizing maps for classification of heterogeneous biological variables (in English). International course on the use of DNA microarrays in basic and applied research. Instituto de fisiologia celular UNAM, Mexico city, September 23-27, 2002. (BY INVITATION)
- Poster: Salgado, H. Sanchez-Lozano, F. Diaz-Peredo, E. Gamma-Castro, S. Garcia-Alonso, D. Perez-Rueda, E. Jimenez-Jacinto, V. **Medrano-Soto**, A. Moreno-Hagelsieb, G. Collado-Vides, J. From RegulonDB to a Multigenomic Microbial Database of Operon Organization and Gene Regulation. [Intelligent Systems for Molecular Biology \(ISMB 2002\)](#). Edmonton, Canada. August 3-8, 2002.
- Talk: Challenging the compositional paradigm in the detection of recent horizontal gene Transfer Events (in Spanish) XXXII Congreso Nacional de Biotecnologia. Monterrey, Nuevo Leon. Mexico. April 3-7, 2002. (BY INVITATION).
- Talk: Challenging the compositional paradigm in Horizontal Gene Transfer detection. (in English) International Symposium CIFN XX aniversario. Morelos, Mexico. December 5-7, 2001. (BY INVITATION)
- Talk: [BClass, Bayesian Self-Organizing Maps for Classification of Heterogeneous Biological Variables: An Application to Transcriptome and Phylogenetic Profile data](#). (in English). Information and Simulation Systems for the Analysis of Gene Regulation and Metabolic

Pathways. Schloss Dagstuhl, Wadern, Saarbruecken Germany. June 24-29, 2001. (BY INVITATION)

- Talk: Challenging the compositional paradigm in recent Horizontal Gene Transfer detection. (in Spanish). Centro de Biotecnología Genómica (IPN). Reynosa, Tamaulipas, Mexico. March 1st, 2001. (BY INVITATION)
- Talk: Applying knowledge discovery and data mining for the analysis of large-scale expression experiments: transcriptome and proteome. (in Spanish). Workshop: Introduction to bioinformatics. Morelos, Mexico. February 19-23 2001. (BY INVITATION)
- Talk: Bioinformatics: Computer Methods in Genomic Science. (in Spanish). International Symposium in Informatics and Computer Science (SIINCO 2000). Chihuahua, Mexico. October 16-21, 2000. (BY INVITATION)
- Talk: Bayesian Clustering and Prediction using Multivariate Mixtures, An Approach to Knowledge Discovery in Biological Databases. (in English). [Molecular Sciences Institute](#). Berkeley, CA. USA. March 13, 2000. (BY INVITATION)
- Talk: Bayesian Classification of Heterogeneous Biological Data and Multivariate Statistics Applied to Codon Usage in E. coli. (in English). [Smithkline Beecham Co.](#) Upper Merion Campus. Philadelphia, PA. USA. December 14, 1999. (BY INVITATION)
- Talk: BClass: Bayesian Self-Organizing Maps for Clustering and Classification of Heterogeneous Biological Databases. (in English). After The Genome V (ATG V). Jackson Lake Lodge. Jackson Hole, Wyoming, USA. October 6-10, 1999. (BY INVITATION)
- Poster: BClass: A General Bayesian Classification Utility for Heterogeneous Databases (in English). Second European Conference on Highly Structured Stochastic Systems (hsss99). Pavia, Italy. September 13-17, 1999.
- Talk: BClass: A General Bayesian Classification Tool for Knowledge Discovery in Heterogeneous Biological Databases. (in English). [International Bioinformatics Summer School \(IBSS'99\)](#). Otto-Von-Guericke Universitaet. Magdeburg, Germany. September 5-10, 1999.
- Attendee: International Workshop on the Linguistics of Biology and the Biology of Language. Nitrogen Fixation Research Center (CIFN). Cuernavaca, Morelos. March 1998.
- Completed course: [Bioinformatics: Computer Methods in Molecular Biology](#). International Center for Genetic Engineering and Biotechnology (ICGEB). Trieste, Italy. September 1997
- Completed course: Transact-SQL (SyBase). DGSCA-UNAM. Cuernavaca, Mor. July-August 1997.

- Completed course: Genetics at the Autonomous University of Chihuahua (UACH). Chihuahua Chih. February-June, 1996.
- Talk: Computer Analysis of Protein Structure Based On the Amino Acids Sequence. (in Spanish). Autonomous University of Chihuahua (UACH). Chihuahua Chih. November 1996. (BY INVITATION)
- Talk: Genetic Protein Synthesis Processes Simulation Via Software. (in Spanish). XVIII International Academic Congress of Electrical and Electronics Engineering. ELECTRO' 96. Chihuahua Chih. October, 1996.
- Talk: Applying Software Engineering to DNA and RNA Nucleotide Sequence Analysis. (in Spanish). III National Congress of Biotechnology. Chihuahua, Chih. October, 1996.
- Talk: A Transgenetic Operation Simulator. (in Spanish). VI Chihuahua's Research Meeting. Chihuahua, Chih. December, 1995.
- Talk: A Database Design as input for a Transgenetic Operation Simulator. (in Spanish). ELECTRO' 95, Chihuahua Chih. October, 1995.
- Talk: A Database Design to Handle Food Technology and Nutrition Research Information. (in Spanish). IEEE REUNE 95, Aguascalientes, Mex. October, 1995.
- Attendee: International Symposium on Artificial Intelligence. ITESM campus Monterrey. Monterrey, Nuevo Leon. Mexico. October, 1994.