

# Curriculum Vitae

**Ziomara P. Gerdtzen.**

**Ph.D in Chemical Engineering**

**Assistant Professor, Department of Chemical Engineering and Biotechnology,  
University of Chile, Beaucheff 850, Santiago Chile**

**zgerdtze@ing.uchile.cl**

**Professional goals:** “To identify metabolic characteristics and culture requirements that enhance productivity in mammalian cells”

“To apply mathematical and computational tools to develop models that capture the phenomena that govern complex biological systems”.

**Strengths:** “Facility to work in the interphase of engineering and biology, adaptability, good interpersonal and team work skills, facility to learn new techniques”.

**Research interests:** “Bioprocesses, Biotechnology, Cell culture, Cell engineering, Mathematical modeling, Medical modeling, Metabolic Networks, Computational biology, Chemical/Biochemical process simulation”.

## **Academic Background**

- 2005 : **Ph.D in Chemical Engineering**, University of Minnesota, under the supervision of Dr. Wei-Shou Hu and Dr. Prodromos Daoutidis. Thesis “Modeling, Analysis and Theoretical Exploration of the Metabolism of Mammalian Cells in Culture”.
- 2000 : **Biotechnology Engineering Professional Degree**, *Summa Cum Laude*, University of Chile. Thesis “Plasmid purification using aqueous two phase systems”.
- 1997 : **B.S. in Biotechnology Engineering**, with honors, University of Chile.

## **Projects**

- 2009 - 2011 : **Principal Investigator for Fondecyt Initiation grant 11090268**  
“Optimization of antibody production in CHO cells through metabolic engineering and media design”.
- 2006 - 2011 : **Young Researcher for Milenium Project ICM-P05-001-F**  
“Institute for Cell Dynamics and Biotechnology: A centre for Systems Biology ”.

- 2007 - 2009 : **Principal Investigator for University of Chile DID Research Initiation grant INI 60/04-2** “Characterization of culture parameters for animal cells: Optimization, modeling and genomic analysis”.
- 2007 - 2008 : **Co Investigator for FONDECYT grant 1061119** “Metabolic engineering for the optimization of metabolism in yeast and mammalian cells: Mathematical modeling and genomic studies”.

### **Working Experience**

- 2006 - ... : Assistant Professor, Department of Chemical Engineering and Biotechnology, University of Chile.
- 2001 - 2005 : Research assistant for BioTechnology Institute, University of Minnesota; and Merck grant, University of Minnesota. “ Mammalian Cell Culture and Metabolism Modeling”.
- 2001 - 2005 : Research assistant for American Chemical Society-Petroleum Research Fund, University of Minnesota “Nonlinear Model Reduction”.

### **Teaching Experience**

- 2006-2012 : Chemistry, Process Analysis, Transfer Operations II, Systems Biology and Functional Genomics, Cell Biology, Introduction to Thesis Work. Department of Chemical Engineering and Biotechnology, University of Chile.
- 2001-2005 : Process Control (Undergraduate Class and Laboratory), Applied Mathematics I – Linear Análisis (Graduate Class), Introduction to Biomolecular Engineering (Undergraduate Class), Systems Análisis of Biological Processes (Graduate Class). Department of Chemical Engineering and Materials Science, University of Minnesota:

### **Student formation**

#### **Undergraduate thesis**

- 2012 : Director of thesis “Characterization of IgG producing CHO cell clones via MFA and qRT-PCR” by Alessandra Baldecchi, University of Chile, Chile.
- 2012 : Director of thesis “Implementation of a cell culture system for hepatocytes as an *in vitro* model for metabolic studies” by Camilo Acuña, University of Chile, Chile.

- 2012 : Co Director of thesis “Process optimization for a malt extract producing plant ” by Andrés Bozzo, University of Chile, Chile.
- 2012 : Director of thesis “Study of energy transfer phenomena in a vulcanization press” by Cristina Stevenson, University of Chile, Chile.
- 2012 : Co Director of thesis “Evaluation of the use of special malts on the production of grist for beer production” by Nicolás Mardones, University of Chile, Chile.
- 2012 : Director of thesis “Design and Simulation of a control system for metabolic shift in mammalian cells” by Damian Baeza, University of Chile, Chile.
- 2011 : Committee member “Suspension culture of CHO cells for the production of a chimeric antibody anti human Tnf” by Jaime Peña, University of Chile, Chile.
- 2011 : Director of thesis “Comparative analysis of lactate metabolism for CHO cells in glucose and galactose” by Camila Wilkens. University of Chile, Chile.
- 2010 : Co Director of thesis “Dynamic modeling for NMDA-R receptor protein network interactions,” by Jaime Campos, University of Chile, Chile.
- 2010 : Director of thesis “Modeling mass transport phenomena in antibiotic release from biodegradable membranes” by Fernando Vera, University of Chile, Chile.
- 2010 : Committee member “Culture optimization of *E.coli* for the production of recombinant cutinases” by Ana Luz Quiroga, University of Chile, Chile.
- 2010 : Director of thesis “Comparative analysis of HEK 293 cells during culture adenovirus production” by Adriana Lopez. University of Chile, Chile.
- 2010 : Committee member “Modeling and numeric simulation of tumor growth and antitumor therapies” by Cristóbal Quiñinao, University of Chile, Chile.
- 2010 : Committee member “Study of the internalization mechanism of cell penetration peptides Tirap and Tirap-Ala in Hela cells” by Karen Flores, University of Chile, Chile.
- 2009 : Committee member “Cell culture optimization of Hek 293 for the production of monoclonal antibodies anti Tnf” by Sergio Mercado, University of Chile, Chile.
- 2007 : Director of thesis “Optimization of HEK293 cells in culture in suspension for growth and adenovirus production” by Veronica Martínez. University

of Chile, Chile.

- 2007 : Committee member “Characterization and recombinant expression of a celulase of antartic origin” by Romela Marin. University of Chile, Chile.
- 2007 : Committee member “Theoretical comparison of the metabolic capabilities of *Saccharomyces cerevisiae* and *Pichia pastoris* for SOD production” by Ornella Cominetti. University of Chile, Chile.
- 2006 : Co Director of thesis “Metabolic flux analysis for a dopaminergic cell line” by María Consuelo Castillo. University of Chile, Chile.
- 2012 : Committee member “Graphical Model for the integration of a gene regulation and metabolic network” by Osvaldo Rubilar. University of Chile, Chile.

### **Magister thesis**

- 2012 : Director of thesis “Design and Simulation of a control system for metabolic shift in mammalian cells” by Damian Baeza, M.Sc. Chemical Engineering, University of Chile, Chile.
- 2011 : Committee member “Suspension culture of CHO cells for the production of a chimeric antibody anti human Tnf” by Jaime Peña, M.Sc. Chemical Engineering, University of Chile, Chile.
- 2011 : Director of thesis “Comparative analysis of lactate metabolism for CHO cells in glucose and galactose” by Camila Wilkens, M.Sc. Chemical Engineering, University of Chile, Chile.
- 2007 : Committee member “Development of a metanolic model for HEK293 cells for the optimization of viral vectors production” by Felipe Zúñiga, M.Sc. Chemical Engineering, University of Chile, Chile.

### **PhD thesis**

- 2012 : Committee member “Effect of soft hipothermic temperatures and growth rate on folding and degradation endoplasmic reticulum associated processes on CHO TF 70R cells” by Mauricio Vergara, UTFSM – PUCV, Chile.
- 2012 : Committee member “Inverse problems and calculus of variation: Aplicaciones to biology and image analysis ” by Rodrigo Lecaros, University of Chile, Chile.
- 2012 : Committee member “metabolic Reconstruction and Metabolic Flux Analysis of Bioleaching Microorganisms in Pure and Mixed Culture” by María Paz Merino. University of Chile, Chile.

2010 : Committee member “The Use Mathematical Tools To Reveal New Insights In Systems Biology” by Carolina Contador Sariego. University of Chile, Chile.

### **Publications**

Castro, J. F., Razmilic, V., Gerdtzen, Z. P., 2012, Genome based metabolic flux analysis of *Ethanoligenens harbinense* for enhanced hydrogen production. International Journal of Hydrogen Energy 0:000-000. DOI: 10.1016/j.ijhydene.2012.11.007 (ISI).

Flores, K. A., Salgado, J. C., Zapata-Torres, G., Gerdtzen, Z. P., Gonzalez, M. J., Hermoso, M. A., 2012, Effect of the electrostatic potential on the internalization mechanism of cell penetrating peptides derived from TIRAP. Biotechnology and Bioprocess Engineering 17:485-499 (ISI).

Gerdtzen, Z. P., 2012, Modeling Metabolic Networks for Mammalian Cell Systems: General Considerations, Modeling Strategies, and Available Tools, Advances in Biochemical Engineering/Biotechnology, Volume 127, 71-108 (ISI).

Wilkins, C. A., Altamirano, C., Gerdtzen, Z. P., 2011, Comparative Metabolic Analysis of Lactate for CHO cells in Glucose and Galactose. Biotechnology and Bioprocess Engineering 16:714-724 (ISI).

Salgado, J. C., Olivera, A., Gerdtzen, Z. P., Tapia, V., Theil, E., Conca, C. and Nunez, M. T., 2011, A Kinetic Model for the Storage of Iron In Ferritin, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 623z.

Flores, K. A., Salgado, J. C., Zapata-Torres, G., Gerdtzen, Z. P., Gonzalez, M. J., Hermoso, M. A., 2011, Effect of the Electrostatic Potential On the Internalization Mechanism of Cell Penetrating Peptides, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 623ar.

Campos, J., Gerdtzen, Z. P. and Salgado, J. C., 2011, A systemic model for the receptor complex NRC/MASC based on its inferred interproteic network, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 623bg.

Wilkins, C. A. and Gerdtzen, Z. P., 2011, Engineering Carbon and Energy Metabolism for CHO Cells for Improved Productivity and Extended Lifespan, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 5b.

Wilkins, C. A., Jimenez, N. E., and Gerdtzen, Z. P., 2011, Engineering Galactose Metabolism for Improved Cell Growth of CHO Cells In Culture, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 623q.

Baeza, D., Salgado, J. C. and Gerdtzen, Z. P., 2011, Model Based Control for Metabolic Shift Regulation In Mammalian Cells, Proceedings of the 2011 Annual Meeting of the American Institute of Chemical Engineers, 764g.

Jimenez, N. E., Wilkens, C. A. and Gerdtzen, Z. P., 2011, Engineering CHO cell metabolism for growth in galactose, BMC Proceedings 5(Suppl 8):P119.

Wilkens, C. A. and Gerdtzen, Z. P., 2011, Engineering CHO cells for improved central carbon and energy metabolism, BMC Proceedings 5(Suppl 8):P120.

Baeza, D., Salgado, J. C. and Gerdtzen, Z. P., 2011, Design and simulation of a controller system for metabolic shift regulation in mammalian cells, BMC Proceedings 5(Suppl 8):P11.

Salgado, J. C., Olivera, A., Gerdtzen, Z. P., Tapia, V., Theil, E. C. , Conca, C. and Nunez, M. T., 2010, Mathematical Modeling of the Dynamic Storage of Iron in Ferritin. BMC Systems Biology Nov 3;4-147 (ISI).

Martinez, V., Gerdtzen, Z. P., Andrews, B.A. & Asenjo, J.A., 2010, Viral vectors for the treatment of alcoholism; use of metabolic Flux Analysis for cell cultivation and vector production. Metabolic Engineering, 12(2):129-37 (ISI).

Yee, J. C., Gerdtzen, Z. P. & Hu, W.-S., 2009, Comparative Transcriptome Analysis to Unveil Genes Affecting Recombinant Protein Productivity. Biotechnology and Bioengineering 102(1):246-63 (ISI).

Gerdtzen, Z. P., Salgado, J. C., Osses, A., Asenjo, J. A., Rapaport, I., & Andrews, B. A., 2009, Modeling heterocyst pattern formation in cyanobacteria, BMC Bioinformatics 10(S6):S16 (ISI).

Gerdtzen, Z. P., & Israel, Y., 2009, Systems Analysis of early time metabolism of ethanol, Proceedings LII Reunión Annual de la Sociedad de Biología de Chile, Biological Research 42(SA), R15.

Salgado, J. C., Olivera, A., Gerdtzen, Z. P., Tapia, V. , Conca, C. and Nunez, M. T., 2009, Modelamiento matemático de la dinámica de almacenamiento de hierro en ferritina, Proceedings LII Reunión Annual de la Sociedad de Biología de Chile, Biological Research 42(SA), R15.

Gerdtzen, Z. P., Salgado, J. C., Osses, A., Asenjo, J. A., Rapaport, I., & Andrews, B. A., 2008, Modeling heterocyst pattern formation in cyanobacteria, EMBnet.News 14(3):96.

Quintanilla, M.E., Tampier, L., Sapag, A., Gerdtzen, Z. P. & Israel, Y, 2007, Gender, alcohol dehydrogenase, acetaldehyde burst and aversion to ethanol in the rat: a systems perspective, Am J Physiol Endocrinol Metab, 293: 531-537 (ISI).

Martinez, V., Gerdtzen, Z. P., Asenjo, J. A. & Andrews, B. A., 2007, Media optimization and metabolic flux analysis of HEK293 cells for adenovirus production, Proceedings of the 13th European Conference in Biotechnology, Journal of Biotechnology 131(2):S201-S202 (ISI).

Contador, C., Gerdtzen, Z. P., Salgado, J. C., & Andrews, B. A., 2007, Study of the dynamic effect of cholesterol lowering drugs using a mathematical model, Proceedings of the 2<sup>nd</sup> Foundations of Systems Biology in Engineering Conference: 237-242.

Gerdtzen, Z. P., Alfaro, J., Perez, C., Larrondo, N., & Asenjo, J. A., 2007, Mathematical modeling of precursor hematopoietic stem cell mobilization and apheresis, Proceedings of the 2<sup>nd</sup> Foundations of Systems Biology in Engineering Conference: 361-366.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., 2005, Nonlinear model reduction for metabolic networks with multiple time scales, Proceedings of the 13<sup>th</sup> Mediterranean Conference on Control and Automation: 519-524.

Wlaschin, K. F., J Yee, J. C., Gerdtzen, Z. P., Kantardijeff, A., McIvor, R. S., & Hu, W.-S., 2005, Engineering cell metabolism for process enhancement, Proceedings of the American Chemical Society, Volume: 229 Pages: U242

Gerdtzen, Z. P., Lee, J., & Hu, W.-S. 2005, Exploring the effect of nutrient perturbations in mammalian cell culture by mathematical modeling, Proceedings of the American Chemical Society, Volume: 229 Pages: U212

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., 2004, Nonlinear reduction for kinetic models of metabolic reaction networks, Met. Eng, 6 (2): 140-154 (ISI).

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., 2002, Nonlinear model reduction of metabolic networks using time-scale analysis, Proceedings of the American Control Conference: 2867-2872.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., 2002, Modeling energy metabolism networks: a reduction approach, Proceedings of the American Chemical Society, Volume: 224 Pages: U201

## **Conferences**

Jimenez, N. E., Wilkens, C. A. and Gerdtzen, Z. P., Engineering CHO cells for improved productivity by overexpressing key enzymes of the galactose metabolism, United Engineering Foundation Conference, Cell Culture Engineering XIII, Scottsdale, Arizona, USA, April 22-27, 2012.

Wilkens, C. A. and Gerdtzen, Z. P., Improving productivity of CHO cells cultures by enhancing energy metabolism during cell growth, United Engineering Foundation Conference, Cell Culture Engineering XIII, Scottsdale, Arizona, USA, April 22-27, 2012 (poster).

Wilkens, C. A. and Gerdtzen, Z. P., 2011, Engineering Carbon and Energy Metabolism for CHO Cells for Improved Productivity and Extended Lifespan, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Advances In Cell Culture IA: Experimental. Minneapolis MN, October 16-21, 2011.

Flores, K. A., Salgado, J. C., Zapata-Torres, G., Gerdtzen, Z. P., Gonzalez, M. J., Hermoso, M. A., Effect of the Electrostatic Potential On the Internalization Mechanism of Cell Penetrating Peptides, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Poster Session: Bioengineering. Minneapolis MN, October 16-21, 2011 (poster).

Salgado, J. C., Olivera, A., Gerdtzen, Z. P., Tapia, V., Theil, E., Conca, C. and Nunez, M. T., A Kinetic Model for the Storage of Iron In Ferritin, AIChE, American Institute of Chemical

Engineering, Food, Pharmaceutical & Bioengineering Division, Poster Session: Bioengineering. Minneapolis MN, October 16-21, 2011 (poster).

Wilkins, C. A., Jimenez, N. E., and Gerdtzen, Z. P., Engineering Galactose Metabolism for Improved Cell Growth of CHO Cells In Culture, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Poster Session: Bioengineering. Minneapolis MN, October 16-21, 2011 (poster).

Campos, J., Gerdtzen, Z. P. and Salgado, J. C., A systemic model for the receptor complex NRC/MASC based on its inferred interproteic network, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Poster Session: Bioengineering. Minneapolis MN, October 16-21, 2011 (poster).

Baeza, D., Salgado, J. C. and Gerdtzen, Z. P., Model Based Control for Metabolic Shift Regulation In Mammalian Cells, AIChE, American Institute of Chemical Engineering, Computing and Systems Technology Division, Control In Medicine and Biology. Minneapolis MN, October 16-21, 2011.

Baeza, D., Salgado, J. C. and Gerdtzen, Z. P., Design and simulation of a controller system for metabolic shift regulation in mammalian cells, European Society for Animal Cell Culture 22nd Meeting, ESACT 2011, Vienna, Austria, May 15-18, 2011 (poster).

Wilkins, C. A. and Gerdtzen, Z. P., Engineering CHO cells for improved central carbon and energy metabolism, European Society for Animal Cell Culture 22nd Meeting, ESACT 2011, Vienna, Austria, May 15-18, 2011 (poster).

Jimenez, N. E., Wilkins, C. A. and Gerdtzen, Z. P., Engineering CHO cell metabolism for growth in galactose, European Society for Animal Cell Culture 22nd Meeting, ESACT 2011, Vienna, Austria, May 15-18, 2011.

Salgado, J.C., Olivera, A. , Gerdtzen, Z. P. , Tapia, V., Theil, E.C., Conca, C., & Nunez, M.T., A systems biology approach to study of the dynamics of iron storage in ferritin, 1st International Conference on Bioinformatics (SoIBio 2010), Termas de Chillán, Chile, September 26-28, 2010 (poster).

Campos, J., Gerdtzen, Z. P. & Salgado, J. C., A systemic model for the receptor complex NRC/MASC based on its inferred interproteic network, 1st International Conference on Bioinformatics (SoIBio 2010), Termas de Chillán, Chile, September 26-28, 2010.

Baeza, D., Salgado, J. C. & Gerdtzen, Z. P., Design and simulation of a controller system for metabolic shift regulation in mammalian cells, 1st International Conference on Bioinformatics (SoIBio 2010), Termas de Chillán, Chile, September 26-28, 2010 (poster).

Wilkins, C. A., Jimenez, N. E. and Gerdtzen, Z. P., Increasing Productivity in CHO Cells Through Metabolic Engineering and Media Design, United Engineering Foundation Conference, Metabolic Engineering VIII, Jeju Island, South Korea, June 13-18, 2010 (poster).

Gerdtzen, Z. P., Salgado, J. C., Andrews, B. A., & Asenjo, J. A., A Metabolic Model for the Optimization of Adenoviral Vector Production, 8th World Congress of Chemical Engineering (WCCE8), Montréal, Quebec, Canada, August 23-27, 2009 (poster).

Wilkins, C. A., Altamirano, C. and Gerdtzen, Z. P., Comparative metabolic analysis of lactate for CHO cells in glucose and galactose, 8th World Congress of Chemical Engineering (WCCE8), Montréal, Quebec, Canada, August 23-27, 2009.

Salgado, J. C., Olivera, A., Gerdtzen, Z. P., Tapia, V., Conca, C. and Nunez, M. T., Mathematical Modeling of the Dynamic Storage of Iron in Ferritin, Sociedad de Biología de Chile, Pucón, Chile, November 17-20, 2009.

Gerdtzen, Z. P., & Israel, Y., Systems Analysis of early time metabolism of ethanol, Sociedad de Biología de Chile, Pucón, Chile, November 17-20, 2009.

Gerdtzen, Z. P., Salgado, J. C., Osses, A., Asenjo, J. A., Rapaport, I., & Andrews, B. A., Modeling heterocyst pattern formation in cyanobacteria, RIB (Red Iberoamericana de Bioinformatica) Conference, Santiago, Chile, October 15-17, 2008.

Andrews, B. A., Martinez, V. and Gerdtzen, Z. P., A comparative study of cell growth and adenovirus production using suspension and stationary cell culture, 13th International Biotechnology Symposium, Dalian, China, October 12-17, 2008.

Gerdtzen, Z. P., Salgado, J. C., Osses, A., Asenjo, J. A., Rapaport, I., & Andrews, B. A., Modeling heterocyst pattern formation in cyanobacteria, EMBnet Conference, Martina Franca, Italy, September 18-20, 2008 (poster).

Asenjo, J. A., Martinez, V., Gerdtzen, Z. P., Karahanian, E., Andrews, B. A. & Israel, Y., Gene therapy strategies, design and production of viral vectors for the treatment of alcoholism, United Engineering Foundation Conference, Cell Culture Engineering XI, Sunshine Coast, Queensland, Australia, April 13-18, 2008.

Gerdtzen, Z. P., Alfaro, J., Perez, C., Larrondo, N., & Asenjo, J. A., Modelamiento del proceso de movilización y aféresis de células troncales hematopoyéticas precursoras, XVI Congreso Chileno Hematología y VI Congreso Medicina Transfusional, Coquimbo, Chile, September 24 - 27, 2008 (poster).

Martinez, V., Gerdtzen, Z. P., Asenjo, J. A. & Andrews, B. A., Media optimization and metabolic flux analysis of HEK293 cells for adenovirus production, 13th European Conference in Biotechnology, Barcelona, Spain, September 16 - 19, 2007 (poster).

Contador, C., Gerdtzen, Z. P., Salgado, J. C., & Andrews, B. A., Study of the dynamic effect of cholesterol lowering drugs using a mathematical model, Foundations of Systems Biology in Engineering, Stuttgart, Germany, September 9 - 12, 2007 (poster).

Gerdtzen, Z. P., Alfaro, J., Perez, C., Larrondo, N., & Asenjo, J. A., Mathematical modeling of precursor hematopoietic stem cell mobilization and apheresis, Foundations of Systems Biology in Engineering, Stuttgart, Germany, September 9 - 12, 2007 (poster).

Gerdtzen, Z. P., Alfaro, J., Perez, C., Larrondo, N., & Asenjo, J. A., Modelamiento del proceso de movilización y aféresis de células troncales hematopoyéticas precursoras, IV Encuentro de Investigación VID, Santiago, Chile, December 5 - 9, 2007.

Gerdtzen, Z. P., Salgado, J. C., Zuñiga, F., Andrews, B. A., & Asenjo, J. A., A Metabolic Model for the Optimization of Adenoviral Vector Production, United Engineering Foundation Conference, Metabolic Engineering VI, Noordwijkerhout, Netherlands, October 1-5, 2006 (poster).

Gerdtzen, Z. P., de Leon Gatti, M., Lee, J. & Hu, W.-S., Study of the Effect of Enzyme and Amino Acid Transport Perturbations for Mammalian Cells in Culture via a Mathematical Model, United Engineering Foundation Conference, Cell Culture Engineering X, Whistler, Vancouver, Canada, April 23-28, 2006 (poster).

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Nonlinear model reduction for metabolic networks with multiple time scales, 13th the Mediterranean Conference on Control and Automation, Limassol, Cyprus, June 27-29, 2005.

Gerdtzen, Z. P., Lee, J., & Hu, W.-S. Exploring the effect of nutrient perturbations in mammalian cell culture by mathematical modeling, ACS, American Chemical Society, San Diego, CA, March 13-17, 2005.

Wlaschin, K. F., J Yee, J. C., Gerdtzen, Z. P., Kantardijeff, A., McIvor, R. S., & Hu, W.-S., Engineering cell metabolism for process enhancement, ACS, American Chemical Society, San Diego, CA, March 13-17, 2005.

Yee, J. C., Gerdtzen, Z. P., Wlaschin, K. F., Philip, R. J., Yap, M., & Hu, W.-S., Large Scale Comparative Transcription Profiling on Stress-induced Culture, 4th Annual Medical Alley/MNBIO Conference & Expo, St. Paul, Minnesota, October 5 & 6, 2005 (poster).

Yee, J. C., Wlaschin, K. F., Gerdtzen, Z. P., Nissom, P. M., Yap, M., & Hu, W.-S., Functional Annotation of CHO ESTs Through A Combination of Sequence Homology and Comparative Gene Expression Profiling, AIChE, American Institute of Chemical Engineering, Austin TX, November 7-12, 2004.

Gerdtzen, Z. P., Lee, J. & Hu, W.-S., Exploring the effect of nutrient perturbations in mammalian cell culture by mathematical modeling, 4th Annual Medical Alley/MNBIO Conference & Expo, St. Paul, Minnesota, October 5 & 6, 2005 (poster).

Hossler, P., Gerdtzen, Z. P., & Hu, W.-S., Visualization of glycoform distribution for the optimization of antibody producing CHO cells, AIChE, American Institute of Chemical Engineering, Austin TX, November 7-12, 2004.

Gerdtzen, Z. P., Yee, J. C., Wlaschin, K. F., Nissom, P. M., Yap, M., & Hu, W.-S., Large Scale Comparative Transcription Profiling on Temperature Shift in Cell Culture, 12th International Biotechnology Symposium, Santiago de Chile, Chile, October 17-22, 2004.

Gerdtzen, Z. P., Lee, J., de Leon Gatti, M., & Daoutidis, P., & Hu, W.-S., Dissecting the Mechanism of Metabolic Shift in Mammalian Cell Culture by Mathematical Modeling, 12th International Biotechnology Symposium, Santiago de Chile, Chile, October 17-22, 2004 (poster).

Gerdtzen, Z. P., de Leon Gatti, M., Lee, J., & Daoutidis, P., & Hu, W.-S., Identification of Target genes for Cell Engineering Via a Metabolic Model, United Engineering Foundation Conference, Cell Culture Engineering IX, Cancun, Mexico, March 7-12, 2004 (poster).

Andrews, B. A., Gerdtzen, Z. P. & Asenjo, J. A., Rationalized Methods for the Purification of Plasmids for Gene Therapy: Chromatography and Liquid Extracation, 12th International Conference on Biopartitioning and Purification. Vancouver, British Columbia, Canada, June 2003.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Reduction of nonlinear kinetic models of metabolic networks with multiple time scales, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Modeling and Operation Methods in Biosystems. San Francisco CA, November 16-21, 2003.

Hu, W.-S., Rink, A., Daoutidis, P., de Leon Gatti, M., Gerdtzen, Z.P., Hossler, P., Narayanan, R. A., Wlaschin, K., Wong, K., Philip, R. J., Sanny, A., Tan, K. S., Ong, P.F., Nissom, P. M., Lo, S.L., Chew, Y.C., Lim, K.M., Wong, C.F., and Yap, M., Integrating genomic exploration and systems analysis in mammalian cell culture engineering, International Symposium on Bioprocess and Biomolecular Engineering, East China University of Science and Technology (ECUST). Shanghai, China, May 25-28, 2003.

Hu, W.-S., Korke, R, de Leon Gatti, M., Gerdtzen, Z., and Daoutidis, P., Integrating system analysis and large scale gene expression profiling in mammalian cell culture engineering, EMCC-3 - 3rd Chemical Engineering Conference for Collaborative Research in Eastern Mediteranean. Thessaloniki, Greece, May 14-16, 2003.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Reducing the complexity of kinetic models of metabolic networks: a time-scale approach, AIChE, American Institute of Chemical Engineering, Food, Pharmaceutical & Bioengineering Division, Modeling and Operation Methods in Biosystems. Indianapolis IN, November 3-8, 2002.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Reducing the complexity of kinetic models of metabolic networks, United Engineering Foundation Conference, Metabolic Engineering IV: Applied System Biology. Il Ciocco, Castelvechio Pascoli, Italy, October 6-11, 2002 (poster).

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Modeling energy metabolism networks: a reduction approach, ACS-American Chemical Society, National meeting, Division of Biochemical Technology, Bioprocess Monitoring and Control. Boston MA, August 18-22, 2002.

Gerdtzen, Z. P., Daoutidis, P. & Hu, W.-S., Nonlinear model reduction of metabolic networks using time-scale analysis, American Control Conference. Anchorage, Alaska, May 8-10, 2002.

### ***Awards and Scholarships***

1996-1998 : Dean's list for outstanding academic performance, Faculty of Physical and Mathematical Sciences, University of Chile.

## **Other Interests**

- Jazz, theater, classical music, foreign languages.

## **Working Preferences**

Field : Academia, Research and Development, Production and Engineering, Consultancy.  
Position : Professor (tenure track), Research and development scientist.

## **References**

Wei-Shou Hu wshu@cems.umn.edu Phone: (612)-625-0546	Department of Chemical Engineering and Materials Science University of Minnesota 421 Washington Ave SE Minneapolis, MN 55455
Prodromos Daoutidis daoutidi@cems.umn.edu Phone: (612)-625-8818	Department of Chemical Engineering and Materials Science University of Minnesota 421 Washington Ave SE Minneapolis, MN 55455
Dra. Barbara A. Andrews bandrews@ing.uchile.cl Phone: (56 - 2) 978 4284 (56 - 2) 978 4710	Centre for Biochemical Engineering and Biotechnology. Department of Chemical Engineering and Biotechnology, University of Chile. Beauchef 861, Santiago Centro, Santiago, Chile
Dr. Juan A. Asenjo juasenjo@ing.uchile.cl Phone: (56 - 2) 978 4284 (56 - 2) 978 4723	Centre for Biochemical Engineering and Biotechnology. Department of Chemical Engineering and Biotechnology, University of Chile. Beauchef 861, Santiago Centro, Santiago, Chile.
Dr. Leandro Herrera Z. leherrer@ing.uchile.cl Phone: (56 - 2) 978 4284 (56 - 2) 978 4163	Decontamination Processes Engineering Group. Department of Chemical Engineering and Biotechnology, University of Chile. Beauchef 861, Santiago, Chile.
Dr. Carlos Conca R. cconca@dim.uchile.cl Phone: (56 - 2) 978 4459	CMM Centro de Modelamiento Matemático, Department of Mathematical Engineering, University of Chile. Av. Blanco Encalada 2120 Piso 7, Santiago, Chile.