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## PROFESSIONAL EXPERIENCE

- 2009- Associate Professor (Early Tenure)  
Biomedical Engineering Department and  
Chemical & Biochemical Engineering Department  
*Rutgers, The State University of New Jersey*
- 2009- Adjunct Associate Professor  
Department of Surgery  
*RWJ Medical School - UMDNJ*
- 2008- Undergraduate Program Director  
Biomedical Engineering Department  
*Rutgers, The State University of New Jersey*
- 2008- Member of the Graduate Faculty, Graduate Program in Computational  
Biology & Molecular Biophysics (BioMaPS)  
*Rutgers, The State University of New Jersey*
- 2008- Affiliated Faculty  
Center for Engineering in Medicine  
*Massachusetts General Hospital & Harvard Medical School*
- 2004-2009 Assistant Professor  
Biomedical Engineering Department and  
Chemical & Biochemical Engineering Department  
*Rutgers, The State University of New Jersey*
- 2002-2004 Knowledge Capitalization Technical Program Leader  
Corporate Strategic Research Laboratories  
*ExxonMobil Research and Engineering Company*
- 2001-2004 Engineering Associate  
Corporate Strategic Research Laboratories  
*ExxonMobil Research and Engineering Company*
- 1998-2001 Senior Engineer  
Corporate Strategic Research Laboratories  
*ExxonMobil Research and Engineering Company*
- 1996-1998 Research Associate  
Corporate Research Science Laboratories  
*Exxon Research and Engineering Company*

## EDUCATION

- 1993-1996 Postdoctoral Fellow, Chemical Engineering Department, *Princeton University*  
Faculty Advisor: Prof. Christodoulos A. Floudas

- Areas of Research: "*Protein Structure Prediction*" and "*Computational Issues in Global Optimization: Algorithmic Developments and Distributed Computing Implementations*"
- 1990-1993 Ph.D., Chemical Engineering Department, *Purdue University*  
Faculty Advisor: Prof. Gintaras V. Reklaitis  
Thesis Topic: "*Approaches to Asynchronous and Decentralized Decision Making*"
- 1988-1990 MS, Chemical Engineering Department, *Purdue University*  
Faculty Advisor: Prof. Venkat Venkatasubramanian  
Thesis Topic: "*Genetic Algorithmic Approaches to Process Design and Optimization*"
- 1983-1988 Diploma, Chemical Engineering Department, *NTUA, Greece*  
Faculty Advisor: Prof. Dimitri P. Tassios  
Thesis Topic: "*The VdW-711 Equation of State for Polar Compounds and Mixtures*"

## AWARDS

- Rutgers FASIP Award for Teaching, Research, and Service (2005, 2006, 2007, 2008, 2009)
- Excellence in Teaching Award, Engineering Governing Council, School of Engineering, Rutgers University (2006)
- Outstanding contributed paper, Foundations of Computer-Aided Process Design: Discovery through Product and Process Design, Princeton, NJ, July 2004.

## BOOKS

- Androulakis, Boustany, Langrana, Yarmush, *Introduction to Biomedical Engineering* (in preparation)

## FEDERAL REPORTS

- Euling, S., S. Makris, B. Sen, B. Benson, K. Gaido, V. Wilson, C. Keshava, N. Keshava, L. White, P. Foster, I.P. Androulakis, M. Ovacik, S. Hester, L.E. Gray, C. Thompson and W. Shiu, *An Approach to Using Toxicogenomic Data in EPA Human Health Risk Assessments: A Dibutyl Phthalate Case Study*, National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC 20460

## PEER REVIEWED JOURNAL PUBLICATIONS

### Accepted or in press

1. He, K-Y., I.P. Androulakis and M.G. Ierapetritou, On-the-fly reduction of kinetic mechanisms using element flux analysis, *Chem. Eng. Sci.*, Accepted for publication (2009)
2. He, K., M.G. Ierapetritou and I.P. Androulakis. Integration of on-the-fly kinetic reduction with multidimensional CFD. *AIChE JI*, Accepted for publication, (2009)
3. Tung, N.T., R. Nowakoski, and I.P. Androulakis, Unsupervised selection of highly coexpressed and non-coexpressed genes, *OMICS* (in press)
4. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, Translational potential of systems-based models of inflammation, *Clinical and Translational Science* (in press)

5. Foteinou, P.T., E. Yang and I.P. Androulakis, Networks, Biology and Process Systems Engineering: A Case Study in Inflammation, *Comp. Chem. Eng.*, (in press)
6. Ierapetritou, M.G., P., Georgopoulos, C.M. Roth and I.P. Androulakis, Tissue-level Modeling of Xenobiotic Metabolism in Liver: An emerging tool for enabling clinical translational research, *Clinical Translation Sciences* (in press)
7. Androulakis, I.P., P. Georgopoulos, M.G. Ierapetritou and C.M. Roth, Multiscale Modeling of Hepatic Processes in a Virtual Tissue/Organ Framework, *Ann. Rev. Biomedical Engineering* (invited)

## Published

1. Yang, E., R.R. Almon, D.C. Dubois, W.J. Jusko and I.P. Androulakis, Modeling transcriptional dynamics, submitted, *PLOS ONE* 4(7):e5992 (2009)
2. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, in silico simulation of corticosteroids effects on an NFkB-dependent indirect response model of systemic inflammation in peripheral human blood leukocytes, submitted, *PLoS ONE*, 4(3):e4706 (2009)
3. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, A multiscale model for the assessment of autonomic dysfunction in human endotoxemia, *J. Crit. Care*, 24(3):e25(2009)
4. Nguyen T. T. and Androulakis I. P. Recent Advances in the Computational Discovery of Transcription Factor Binding Sites. *Algorithms*. 2(1):582-605 (2009)
5. Yang, E., and I.P. Androulakis, Assessing and Selecting Gene Expression Signals Based Upon the Quality of the Measured Dynamics, *BMC Bioinformatics*, Feb 10;10(1):55 (2009)
6. Foteinou, P.T., E. Yang, G.K. Saharidis, M.G. Ierapetritou, and I.P. Androulakis, A systematic framework for the synthesis and analysis of regulatory networks, *Journal of Global Optimization*, 43(2):263 (2009)
7. Gerecke, D.R., M. Chen, S. Isukapalli, Y-C-. Chan, W. Tong, I.P. Androulakis and P.G. Georgopoulos, Differential gene expression profiling of mouse skin after sulfur mustard exposure: extended time response and inhibitor effect, *Env. Tox. Pharm.* 234(2):156-65 (2008)
8. Yang, E., M.L. Yarmush and I.P. Androulakis Transcription Factor Network Reconstruction using the Living Cell Array, *J. Theor. Biology* , 256(3):393-407 (2008)
9. Euling, S.Y., Makris, S., Sen, B., White, L., Benson, R., Gaido, K.W., Kim, A.S., Hester, S., Wilson, V.S., Keshava, C., Keshava, N., Foster, P.M., Androulakis, I.P., Ovacik, M., Ierapetritou, M.G., Gray, L.E., Thompson, C., and Chiu, W. An approach to using genomics data in risk assessment: Dibutyl phthalate (DBP) case study. *Birth Defects Research Part a-Clinical and Molecular Teratology* **82**, 296-29 (2008)
10. Almon, R.R., E. Yang, Lai, W., I.P. Androulakis, D.C. Dubois and W.J. Jusko, Relationships between Circadian Rhythms and Modulation of Gene Expression by Glucocorticoids in Skeletal Muscle, *AJP Regulatory*, 326(3):700-16 (2008)
11. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, Modeling Endotoxin-Induced Systemic Inflammation Using an Indirect Response Approach, *Math. Biosciences*, 217(1):27-42 (2008)
12. Ovacik, M. and I.P. Androulakis, On the potential for integrating gene expression and metabolic flux data: A review, *Current Bioinformatics*, 3(3):142-148 (2008)
13. He, K., M.G. Ierapetritou and I.P. Androulakis, A graph-based approach for developing adaptive representations of complex reaction mechanisms, *Comb & Flame*, 155(4):585-604 (2008)
14. Furman, K.C., and I.P. Androulakis, A novel MINLP-based representations of the original complex model for predicting gasoline emissions, *Comp. & Chem. Eng.*, 32(12):2857-2876 (2008)

15. Almon, R.R., E. Yang, W. Lai, I.P. Androulakis, D.C. Dubois and W.J. Jusko, Circadian variations in liver gene expression: Relationships to drug action, *J. Pharm. Exp. Therapeutics*, 326(3):700-716 (2008)
16. Yang E, Almon RR, DuBois DC, Jusko WJ, Androulakis IP. Extracting global system dynamics of corticosteroid genomic effects in rat liver. *J. Pharm. Exp. Therapeutics* 324(3):1243-1254 (2008)
17. Yang E, Maguire TJ, Yarmush ML, Berthiaume F, Androulakis IP. Identification of regulatory mechanisms of the hepatic response to thermal injury. *Comp. & Chem. Eng* 32:356-369 (2008)
18. Yan E, Maguire T, Yarmush ML, Androulakis IP. Informative gene selection and design of regulatory networks using integer optimization. *Comp. & Chem. Eng* 32(4-5):633-649 (2008)
19. Foteinou, P.T., S. Calvano, S. Lowry and I.P. Androulakis, An indirect response model of endotoxin-induced systemic inflammation, *Journal of Critical Care*, **22** (4):337-338 (2007)
20. Yang E, Maguire T, Yarmush ML, Berthiaume F, Androulakis IP. Bioinformatics analysis of the early inflammatory response in a rat thermal injury model. *BMC Bioinformatics*, 10:10 (2007)
21. Maguire T, Davidovich AE, Wallenstein EJ, Novik E, Sharma N, Pedersen H, Androulakis IP, Schloss R, Yarmush M. Control of hepatic differentiation via cellular aggregation in an alginate microenvironment. *Biotechnology & Bioengineering* 98:631-644. (2007)
22. Yang E, Foteinou PT, King KR, Yarmush ML, Androulakis IP.. A novel non-overlapping bi-clustering algorithm for network generation using living cell array data. *Bioinformatics* 23:2306-2313 (2007)
23. Yang E, Simcha D, Almon RR, Dubois DC, Jusko WJ, Androulakis IP. Context specific transcription factor prediction. *Annals of Biomedical Engineering* 35(6):1053-1067. (2007)
24. Androulakis, I.P., E. Yang, and R.R. Almon, Analysis of time-series gene expression data: Methods, challenges, and opportunities. *Annual Review of Biomedical Engineering*, **9**: p. 205-228 (2007)
25. Androulakis, I.P., New approaches for representing, analyzing and visualizing complex kinetic transformations, *Comp & Chem. Eng*, **31**(1): p. 41-50 (2006.)
26. Androulakis, I.P., T.A. Barckholtz, J.M. Grenda, and J.W. Bozzelli, Propagation of Uncertainty in Chemically Activated Systems, *AIChE J.* **52**(9): p. 3246-3256 (2006)
27. Knapinska, A.M., P.I. Irizarry, S.Adusumalli, I.P. Androulakis and G. Brewer, Molecular Mechanisms Regulating mRNA Stability: Physiological and Pathological Significance, *Current Genomics*, **6**(6):471-486 (2005)
28. Androulakis, I.P., "Selecting maximally informative genes", *Comp. & Chemical Engineering, Special issue on Systems Engineering Challenges and Opportunities in Biology*, **29**:535-546, (2005)
29. Androulakis, I.P., "Store and retrieve representations of dynamic systems motivated by studies in gas phase chemical kinetics", *Comp. & Chem. Engng.*, **28**:2141-2155 (2004)
30. Androulakis, I.P., J.M. Grenda, and J.W. Bozzelli, "Time-integrated element flux pointers for enabling the analysis and reduction of deailed kinetic mechanisms", *AIChE J.*, **50**(11): 2965-2970 (2004)
31. Androulakis, I.P., J.T. Farrell, C.S. Hsu, K. Qian, and K. Nakakita, "An Integrated Approach for Creating Model Fuels", *Energy and Fuels*, **19**(1):111-119 (2004 )
32. Grenda, J.M., I.P. Androulakis, A.M. Dean and W.H. Green, "Application of computational kinetic mechanism generation to model the autocatalytic pyrolysis of methane", *Ind. & Eng. Chem. Res.*, **45**(5):1000-1010(2003)
33. Sirdeshpande, I.P. Androulakis and M.G. Ierapetritou, "Design of flexible reduced kinetic models", submitted, *AIChE J.*, 47:2461-2474 (2001)
34. Reyes, S.C, I.P. Androulakis, J.H. Sinfelt and M.C. Huff, Some critical issues in the analysis of partial oxidation reactions in monolith reactors, In *Studies in Surface Science and Catalysis* (E. Iglesia, J.J. Spivey, and T.Z. Fleisch, Eds.), **136**, 495-500 (2001)
35. Androulakis I.P., Kinetic mechanism reduction based on an integer programming approach, *AIChE J.*, **46**, 361-370 (2000)

36. Huff, M.C., I.P. Androulakis, J.H. Sinfelt, and S.C. Reyes, The contribution of gas phase reactions in the Pt-catalyzed conversion of Ethane-Oxygen mixtures, *J. Catal.*, **191**, 46-54 (2000)
37. Adjiman, C.S., I.P. Androulakis and C.A. Floudas, Global optimization of mixed-integer nonlinear problems, *AIChE J.*, **46**, 1796-1798 (2000)
38. Androulakis, I.P. and S.C. Reyes Role of distributed oxygen addition and product removal in the oxidative coupling of methane, *AIChE J.*, **45**, 360-379 (1999)
39. Androulakis, I.P. and G.V. Reklaitis, Approaches to asynchronous and decentralized decision-making, *Comput. & Chem. Engng.*, **23**, 341-355 (1999)
40. Adjiman, C.S., I.P. Androulakis I.P., and C.A. Floudas, A global optimization method,  $\alpha$ BB, for general twice differentiable constrained NLPs – II Implementation and computational results, *Comp. & Chem. Eng.*, **22**, 1159-1179 (1998)
41. Klepeis, J.L., I.P. Androulakis, M.G. Ierapetritou, and C.A. Floudas, Predicting solvated peptide conformations via global minimization of energetic atom-to-atom interactions, *Comp. & Chem. Eng.*, **22**, 765-788 (1998)
42. Androulakis, I.P., N.N. Nayak, M.G. Ierapetritou, D.S. Monos and C.A. Floudas, Identification of peptide binding specificity for pocket 1 of HLA-DR1 based on global minimization of energy interactions. *Proteins: Structure, Function and Genetics*, **29**, 87-102 (1997).
43. Maranas, C.D., I.P. Androulakis IP, C.A. Floudas, A.J. Berger, and J.M. Mulvey, Solving long-term financial planning problems via global optimization, *J. Econ. Dyn. Control*, 1997, **21**, 1405-1425 (1997)
44. Androulakis, I.P., C.D. Maranas, and C.A. Floudas, Prediction of oligopeptide conformations via deterministic global optimization, *J. Glob. Optim.*, **11**, 1-34 (1997)
45. Adjiman, C.S., I.P. Androulakis, and C.A. Floudas, Global optimization of MINLP problems in process synthesis and design, *Comp. & Chem. Eng.*, **21**, S445-S450 (1997)
46. Adjiman, C.S., I.P. Androulakis, C.D. Maranas, and C.A. Floudas, A global optimization method,  $\alpha$ BB, for process design, *Comp. & Chem. Eng.*, **20**, S419-S424, (1996)
47. Androulakis I.P., C.D. Maranas, and C.A. Floudas,  $\alpha$ BB A global optimization method for general constrained nonconvex problems, *J. Glob. Optim.*, **7**, 337-363 (1995)
48. Androulakis, I.P. and G.V. Reklaitis, Analysis of the spurious behavior of asynchronous relaxation algorithms, *Comp. & Chem. Eng.*, **19**, 827-845 (1995).
49. Androulakis, I.P. and V. Venkatasubramanian, A genetic algorithmic framework for process design and optimization, *Comp. & Chem. Eng.*, **15**, 217-228 (1991).
50. Kalospiros, N.YAS., G.M. Misseyannis, I.P. Androulakis, and D.P. Tassios, Application of the VdW-711 equation of state to polar mixtures – Correlation of binary and prediction of multicomponent vapor-liquid equilibria, *Fluid Phase Equil.*, **64**, 173-184 (1991).
51. Androulakis, I.P., N.S. Kalospiros, and D.P. Tassios, Thermophysical properties of pure polar and nonpolar compounds with a modified VdW-711 equation of state, *Fluid Phase Equil.*, **45**, 135-163 (1989).

## SUBMITTED MANUSCRIPTS

1. Treiser, M.D., Yang, E. Gordonov, S., D. Cohen, I.P. Androulakis, J. Kohn and P.M. Mpghe, P.V. Cytoskeleton-based Forecasting of Stem Cell Lineage Fates, *PNAS* (submitted)
1. Scheff, J.D., R.R. Almon, D.C. Dubois, W.J. Jusko and I.P. Androulakis, A new symbolic representation for the identification of informative expression motifs in replicated microarray experiments, *-OMICS* (submitted)
2. Nguyen, T.T., P.T. Foteinou, S.E. Calvano, S.F. Lowry and I.P. Androulakis, Computational identification of transcriptional programs in human endotoxemia, *BMC Systems Biology* (submitted)

3. Dong, X., P.T. Foteinou, S.E. Calvano, S.F. Lowry and I.P. Androulakis, agent-based simulation of endotoxin induced acute inflammatory response in blood leukocytes, *PLoS ONE* (submitted)

## MANUSCRIPTS IN PREPARATION

2. Nguyen, T.T., R.R. Almon, D.C. DuBois, W.J. Jusko and I.P. Androulakis, Accounting for replicates in clustering time series data (in preparation)
3. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, An Integrated Host Response Model for the Assessment of Reduced Heart Rate Variability in Human Endotoxemia, (in preparation)
4. Foteinou, P.T., S.E. Calvano, S.F. Lowry and I.P. Androulakis, Mechanistic-based indirect response models of human inflammation (in preparation)
5. Ovacik, M., R. R. Almon, D.C. Dubois, W.J. Jusko and I.P. Androulakis, Circadian signatures: From gene expression to pathways (in preparation)
6. Ovacik M., Ierapetritou M.G., Georgopoulos P.G., Welsh W Euling S, Sen B, Gaido K, and Androulakis I.P. Overall Pathway Activity: An Alternative Approach for Analyzing Transcriptional Data (in preparation)
7. Orman, M., F. Berthiaume, I.P. Androulakis and M.G. Ierapetritou, Optimization based pathway analysis to elucidate the effects of burn injury on hepatic metabolism (in preparation)
8. Yang, Q., F. Berthiaume and I.P. Androulakis, *in silico* model of thermal injury induced acute inflammation (in preparation)
9. Liu, E., Sung, H-J, Yang, E., Joy, A., Treiser, M.D., Gordonov, S., Kohn, J., Androulakis, I., Moghe, P.V. Combinatorial Polymers as an Engineered Niche for Control of Stem Cell Fates (in preparation)
10. Matthew Treiser , Eric Yang , Simon Gordonov , Daniel Cohen , Ioannis Androulakis , Joachim Kohn , Christopher Chen , Prabhas Moghe

## REFERRED CONFERENCE PROCEEDINGS

1. Foteinou, P.T., E. Yang and I.P. Androulakis, Networks, Biology and Systems Engineering: A Case Study in Inflammation, Proceedings of the *5th International Conference on the Foundations of Computer-Aided Process Operations*, Cambridge, MA (2008)
2. Foteinou, P.T., E. Yang, G.K. Saharidis, M.G. Ierapetritou and I.P. Androulakis, A Mixed Integer Optimization Algorithm to Reverse Engineer Transcriptional Regulatory Networks, Proceeding of the *5th International Conference on the Foundations of Computer-Aided Process Operations*, Cambridge, MA (2008)
3. Yang, E., P.T. Foteinou, K.R. King, M.L. Yarmush and I.P. Androulakis, Extraction of Transcription Factor Networks via Globally Optimal Biclustering, , Proceeding of the *5th International Conference on the Foundations of Computer-Aided Process Operations*, Cambridge, MA (2008)
4. Liang L, Stevens JG, Farrell JT, Huynh PT, Androulakis IP, Ierapetritou MG: An adaptive approach for coupling detailed chemical kinetics and multidimensional CFD, In *5th US National Combustion Meeting; March 25-28; San Diego, CA*. March 25-28 (2008)
5. Yang, E., F. Berthiaume, M. Yarmush and I.P. Androulakis, An integrative systems biology approach for analyzing liver hypermetabolism, *9th International Symposium on Process Systems Engineering & 16th European Symposium on Computer Aided Process Design* (2006)
6. Yang, E., and I.P. Androulakis, Assessing the information content of short time series microarray data, Proceeding of the 28<sup>th</sup> IEEE EMBS Annual International Conference (2006)
7. Wu, J., and I.P. Androulakis, Selecting maximally informative genes: The interplay between accuracy and complexity, Proceedings of the *18th International Conference on Systems Engineering (ICSEng'05), Special Session on Computer Infrastructure for Systems Biology*, Las Vegas (2005)

8. Wu, J., and I.P. Androulakis, Exploring classifiability metrics for selecting informative genes, *Proceeding of 15<sup>th</sup> European Symposium on Computer Aided Process Engineering*, Barcelona (2005)
9. Androulakis, I.P., New approaches for representing, analyzing and visualizing complex kinetic mechanisms, *Proceeding of 15<sup>th</sup> European Symposium on Computer Aided Process Engineering*, Barcelona (2005)
10. Androulakis, I.P., TA. Barckholtz, and J.W. Bozzelli, Assessing the impact of accuracy of ab initio calculations in describing chemically activated systems, *Proceedings of Joint Meeting of the U.S. Section of the Combustion Institution*, Philadelphia, PA (2005)
11. Androulakis, I.P., J. Wu, J. Vitolo and C. Roth, Selecting maximally informative genes to enable temporal expression profiling analysis, *Proceedings of Foundations of Systems Biology in Engineering*, Santa Barbara, CA, (2005)
12. Yang, E., F. Berthiaume, M. Yarmush, and I.P. Androulakis, An integrative systems biology approach for analyzing liver hypermetabolism. *Proceeding of the joint 9<sup>th</sup> Int. Symp. Process Systems Engineering and 16<sup>th</sup> European Symp. Computer Aided Process Engineering*, Garmisch-Partenkirchen / Germany (2005)
13. Farrell, J.T., R.J. Johnston, and I.P. Androulakis, "Molecular structure effects on laminar burning velocities at elevated temperature and pressure", *SAE Paper 2004-01-2936* (2004)
14. Furman, K.C. and I.P. Androulakis, A novel MINLP-based representation of the original complex model for predicting gasoline emissions, *Proceeding of the International Conference on the Foundations of Computer Aided Process Design*, Princeton (2004)
15. Grenda, J.M., I.P. Androulakis, and J.W. Bozzelli, The Combined Use of Automated Kinetic Mechanism Generation and Mechanism Reduction in the Development of Chemical Reaction Models, *Proceedings of the 2<sup>nd</sup> Joint Meeting of the US Sections of the Combustion Institute* (2001)
16. Ierapetritou, M.G., I.P. Androulakis, Uncertainty considerations in the reduction of chemical reaction mechanisms, *Proceedings of the 5<sup>th</sup> International Conference on Foundations of Computer-Aided Process Design*, **96**, 406-410 (1999)
17. Monos, D.S., A. Soulika, E. Argyris, J. Corga, L. Stern, V. Magafa, P. Cordopatis, I.P. Androulakis, and C.A. Floudas, HLA-Peptide interactions: theoretical and experimental approaches, *Proceedings of the 12<sup>th</sup> International Histocompatibility Conference*, (1996)

## BOOK CHAPTERS

1. Scheff, J., P.T. Foteinou, S.E. Calvano, S.F. Lowry and Androulakis, I.P., Multiscale dynamic models of systemic inflammation in humans in *Dynamic Process Modeling*, Pistikopoulos, Georgiadis, Dua Eds., (2009)
2. Foteinou, P.T., J. Scheff, S.E. Calvano, S.F. Lowry and Androulakis, I.P., *in silico* alternatives to animal testing in *Methods in Bioengineering: Alternatives to animal testing*, Maguire, Novick, Langer, Yarmush Eds., (2009)
3. Androulakis, I.P., Mathematical programming approaches for the analysis of microarray data, in *Handbook of Optimization in Medicine*, E. Romeijn, Ed., (2008)
4. Foteinou, P.T., E. Yang, and I.P. Androulakis, Challenges and opportunities for mixed-integer optimization in Systems Biology: Reconstructing gene regulatory networks, in *Computational Optimization: New Research Developments*, Nova Science Publishers, Inc. (2008)
5. Tung, N.T., E. Yang and I.P. Androulakis Machine learning approaches in promoter sequence analysis, in *Machine Learning Research Progress*, Nova Science Publishers, Inc. (2008)
6. Yang, E. and I.P. Androulakis, Assessing the information content of microarray time series, *Encyclopedia of Healthcare Information Systems*, Wickramasinghe, Ed., (2008)

7. Yang, E., A. Misra, T.J. Maguire and I.P. Androulakis, Analysis of Regulatory and Interactions Networks from Clusters of co-expressed Genes" in *Clustering Challenges, in Biological Networks*, S. Butenko and A. Chaovalitwongse, Eds., Word Scientific Publications (2008)
8. Androulakis, I.P. and J. Wu, Optimization methods for the analysis of microarray experiments, *Handbook of Optimization in Medicine*, E. Romeijn, Editor (2008)
9. Androulakis, I.P. and W. Chaovalitwongse, Mathematical programming for data mining, In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Editors, (2007)
10. Chaovalitwongse, W., I.P. Androulakis and P.M. Pardalos, Quadratic integer programming: Complexity and equivalent forms, In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds. (2004)
11. Androulakis, I.P., "Dynamic Programming - Infinite Horizon Problems: Overview", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 514-516, Kluwer Academic Publishers (2001)
12. Androulakis I.P., "Dynamic Programming - Stochastic Shortest Path Problems", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 526-529, Kluwer Academic Publishers (2001)
13. Androulakis, I.P., "Dynamic Programming - Discounted Problems", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 502-503, Kluwer Academic Publishers (2001)
14. Androulakis, I.P., "Dynamic Programming - Un-Discounted Problems", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 529-533, Kluwer Academic Publishers (2001)
15. Androulakis, I.P., "Dynamic Programming - Average Cost per Stage Problems", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 497-500, Kluwer Academic Publishers (2001)
16. Androulakis, I.P., "Dynamic Programming - Inventory Control", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **1**, 516-519, Kluwer Academic Publisher (2001)
17. Androulakis, I.P., "MINLP: Branch & Bound Methods", In *Encyclopedia of Optimization*, C.A. Floudas and P.M. Pardalos, Eds., **3**, 325-331, Kluwer Academic Publishers (2001)
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- Catalytic partial oxidation using staged oxygen addition (US Pat. No. 6,726,850)

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1. Androulakis I.P., A modular approach to transcriptional dynamics and toxicokinetics, 3<sup>rd</sup> Annual Systems Toxicology Symposium, May 20, 2009, Piscataway, NJ
2. Androulakis, I.P., Networks, Biology and Systems Engineering: A Case Study in Inflammation, Chemical Engineering Dept., University of Pittsburgh, PA, March 2009.
3. Androulakis, I.P., Networks, Biology and Systems Engineering: A Case Study in Inflammation, Chemical Engineering Dept., University of South Carolina, SC, Jan 2009.
4. Androulakis, I.P., Networks, Biology and Systems Engineering: A Case Study in Inflammation, Proceeding 5<sup>th</sup> International Conference on the Foundations of Computer-Aided Process Operations, Cambridge, MA, 2008
5. He, K-Y., M.G. Ierapetritou and I.P. Androulakis, On the Use of Elemental Flux Graphs for Developing Adaptive Reduced Representations of Complex Reaction Mechanisms, 12<sup>th</sup> SIAM International Conference on Numerical Combustion, Monterey, CA, 2008
6. Androulakis, I.P., From Data to Models: Systems biology methods and potential applications to toxicoinformatics, Computational Toxicology Seminar Series, National Center for Computational Toxicology, US EPA, 2008
7. Androulakis, I.P., Analysis, reduction and representation of complex reaction mechanisms, NASCRE Meeting, Houston, TX, 2007
8. Androulakis, I.P., What should we be looking for when analyzing microarray data, The Center for Engineering in Medicine, Massachusetts General Hospital, 2005
9. Androulakis, I.P., The interplay between accuracy and complexity: A framework for selecting maximally informative genes, Department of Chemical Engineering, University of Rhodes Island, 2005
10. Androulakis, I.P., Data driven research: The evolving role of computing, Department of Chemical Engineering, University of Southern California, 2003
11. Androulakis, I.P., Computational Approaches for the Automated Generation, Analysis, Reduction and Efficient Computational Implementation of Complex Kinetic Mechanisms”, Department of Chemical Engineering, University of California, Riverside, 2003
12. Androulakis, I.P., B. White, and A. Woronow: Optimization of Markov Models: Viterbi algorithm and integer optimization, 4th International Conference on Frontiers of Global Optimization, Greece, 2003
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1. Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., A Multi-Scale Model for the Assessment of Autonomic Dysfunction in Human Endotoxemia, AIChE National Meeting, November 8-13, 2009, Nashville, TN
2. Dong, X., Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., Agent-based Simulation of Endotoxin Induced Acute Inflammatory Response in Human Blood Leukocytes, AIChE National Meeting, November 8-13, 2009, Nashville, TN
3. Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., A Multi-Scale Model for the Assessment of Autonomic Dysfunction in Human Endotoxemia, Biomedical Engineering Society Annual Meeting, October 7-10, 2009, Pittsburgh, PA
4. Dong, X., Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., Agent-based Simulation of Endotoxin Induced Acute Inflammatory Response in Human Blood Leukocytes, Biomedical Engineering Society Annual Meeting, October 7-10, 2009, Pittsburgh, PA
5. Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., A Multi-Scale Model for the Assessment of Autonomic Dysfunction in Human Endotoxemia, 8th International Conference on Complexity in Acute Illness, August 28-30, 2009, Palo Alto, CA
6. Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., Approaches towards modeling systemic inflammation in humans, 7<sup>th</sup> International Conference on Pathways, Networks, and Systems Medicine, June 6-10, Corfu, Greece
7. Dong, X., Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., Agent-based Simulation of Endotoxin Induced Acute Inflammatory Response in Human Blood Leukocytes, 3rd Annual Systems Toxicology Symposium, May 20, 2009, Piscataway, NJ
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9. Foteinou, P.T., Calvano S.E., Lowry S.F. and Androulakis I.P., A Multi-Scale Physicochemical Model of Systemic Inflammation in Humans, 6th Biomedical Engineering Showcase, March 13, 2009, Newark, NJ
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44. Gerecke, G.K., M. Chen, S. Isukapalli, W. Tong, M.A. Ovacik , P.T. Foteinou, I.P. Androulakis, W. Welsh, P.G. Georgopoulos Differential Gene Expression Profiling of Mouse Skin after Sulfur Mustard Exposure: Extended Time Response and Inhibitor Effect, *Workshop in Systems Toxicology: Multiscale Modeling of Environmental Impacts on Bionetworks*, April 26-27, 2007, Rutgers Busch Campus, Piscataway, New Jersey, U.S.A. (2007)

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99. Androulakis, I.P., V. Venkatasubramanian, a genetic algorithmic framework for process design and optimization, AIChE Annual Meeting, San Francisco, CA, 1989.
100. Androulakis, I.P., N.S. Kalospiros, D.P. Tassios, Thermophysical properties of pure polar and non-polar compounds with a modified VdW-711 equation of state, 10<sup>th</sup> IUPAC International Conference on Thermodynamics, Budapest, Hungary. 1988.

## PROFESSIONAL SOCIETIES

- American Institute of Chemical Engineers
- Society for Complexity in Acute Illness
- Biomedical Engineering Society
- Society of Biological Engineers
- Computer and Systems Technology Division of the AIChE
- Society for Industrial and Applied Mathematics

## ORGANIZER OR CHAIRMAN OF SYMPOSIA

- **Area Chair**, *Systems Biology/Modeling for Biomedical Systems/ Biological Networks*. International Conference on Bioinformatics and Bioengineering (BIBE)
- *Network Analysis and Models of Host/Pathogen Interactions*, BMES Meeting, Pittsburg (2009)
- **Associate Editor**, *Advances in Theory and Clinical Applications of Biological Network Studies*, 31<sup>st</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society (2009)
- *DIMACS Workshop on Nanotechnology and Biology*, Rutgers University (2009)
- *Systems Engineering Approaches in Biology and Biomedicine*, AIChE Annual Meeting, Philadelphia, PA, (2008)
- *Systems Engineering Approaches in Biology and Biomedicine*, AIChE Annual Meeting, Salt Lake, UT, (2007)
- *Multi-scale Modeling*, AIChE Annual Meeting, Salt Lake, UT, (2007)
- *Information Technologies and Process Operations*, AIChE Annual Meeting, Cincinnati, OH (2005)
- *Fuel Cell technology*, AIChE Annual Meeting, Cincinnati, OH (2005)
- *Scheduling and Planning*, AIChE Annual Meeting, Austin, TX (2004)
- *Fuel Processing Session I: Modeling and System Integration*, AIChE Annual Meeting, Austin, TX (2004)
- *Fuel Cell Technology I*, AIChE Annual Meeting, Austin, TX (2004)
- *Complex Systems Modeling*, AIChE Annual Meeting, San Francisco, CA (2003)
- *Data Analysis: Design, Algorithms & Applications*, AIChE Annual Meeting, San Francisco, CA (2003)
- *Information Management in the Process Industries*, AIChE Meeting, November, Indianapolis, IN (2002)
- *Detailed Reaction and Reactor Modeling*, AIChE Annual Meeting, Indianapolis, IN (2002)
- *Applications of System Analysis Tools in Information Processing*, AIChE Annual Meeting, Reno, NV (2001)
- *Detailed Reaction and Reactor Modeling*, AIChE Annual Meeting, Los Angeles, CA (2000)
- *High performance computing: Algorithms and applications*, AIChE Annual Meeting, Los Angeles, CA (2000)

## MEMBERSHIP IN SCIENTIFIC BOARDS AND COMMITTEES

- International Programming Committee Member, The Third International Conference on Foundations of Systems Biology in Engineering (FOSBE), Denver, CO (2009)
- Programming Committee Member, 2008 IEEE International Conference on Data Mining (ICDM-08), Pisa, Italy (2008)
- Executive Committee Member, Environmental Bioinformatics and Computational Toxicology Center (ebCTC) (2005-present)
- Industrial Advisory Board Member, Center for Process Modeling and Control (CPMC), Lehigh University (2001)

## MEMBERSHIP IN EDITORIAL BOARDS

- Editor-in-chief: *Open Access Bioinformatics*

- Editorial Board Member: *The Open Bioinformatics Journal*

## SCIENTIFIC REVIEWER

### Journals

- AIChE Journal; Annals of Biomedical Engineering; Annual Reviews of Biomedical Engineering; Biophysical Journal; BMC Bioinformatics; BMC Systems Biology; Computers and Chemical Engineering; Energy and Fuels; Industrial & Engineering Chemistry Research; Journal of Catalysis; Journal of Global Optimization; Naval Research Logistics; Optimization and Engineering, Algorithms for Molecular Biology, IET Systems biology, Computers in Biology

### Conferences

- AIChE National Meeting (1996-)
- BMES National Meeting (2008, 2009)
- EMBC International Meeting (2009)
- International Conference on Decision and Control (2002)
- State of the Art in Global Optimization: Computational Methods and Applications (1998)

### Panels

- NSF Panel Reviewer

## ADVISING and TEACHING

### Postdoctoral Research Associate Supervisor

- W. (Art) Chaovalitwongse (2003-2004). Current position: Assistant Professor, Industrial & Systems Engineering Department, Rutgers University

### PhD Students

1. Eric Yang: Graduated August 2008.  
Current position Harvard Medical School, Massachusetts General Hospital, NIH Kischstein Fellowship Awardee
2. Peggy Foteinou. Expected Graduation Spring 2010
3. MERIC Ovacik. Expected Graduation Spring 2010
4. Kaiyuan He. Expected Graduation Summer 2010
5. Nguyen Thanh Tung. Expected Graduation Spring 1011
6. Qian Yang. Expected Graduation Summer 2012
7. Mehmet Orman. Expected Graduation Summer 2012
8. Scheff Jeremy. Expected Graduation Summer 2013

### Graduated Students

1. Tien Phong Huynh, MS (2007)
2. James Wu, MS (2006)

### PhD Students co-Advised

1. Anna Knapinska (Molecular Biology, Biointerfaces IGERT Fellow)
2. Eric Ho (Molecular Biology, Biointerfaces IGERT Fellow)

### PhD Thesis Committee Member

1. Aditya Bindal (PhD 2004)
2. Dan Wu (PhD 2005)
3. Ipsita Banerje (PhD 2005)
4. Timothy Maguire (PhD 2007)
5. Eddie Davis (PhD 2008)
6. Loreto Valenzuela (PhD 2008)
7. Zhiping Zhu (PhD 2009)
8. Matt Treiser (expected 2009)
9. Er Liu (Expected 2010)
10. Sang Tae Doh (expected 2010)

#### Undergraduate and High School Students Advised

1. Michael M. Quien (2008-2010) Honors Academy
2. Xu Dong (2008-2009) Honors Academy, currently PhD candidate, Biomedical Engineering, Rutgers University
3. Jeremy Scheff (2007-2008) Honors Academy, currently PhD candidate, Biomedical Engineering, Rutgers University
4. Jocelyn Alexander (2007-2008) Senior Design, currently EOSHI Specialist
5. Andrew Abdou (2007-2008) Senior Design
6. Farzana Sharmin (2007-2008) Senior Design
7. Bishoy Hana (2007-2008) Senior Design
8. Brendan Cyrus (2007-2008) Senior Design
9. Biren Tarpara (2007) Special Problems
10. David Simcha (2006-2007) Honors Academy, currently PhD candidate, Biomedical Engineering, Johns Hopkins University)
11. Kelly Horn (2006) Slade Scholar, currently PhD candidate Bioengineering, Rice University)
12. Amit Misra (2006) Currently Medical student
13. Hiren Solanki (2005) Special Problems
14. Cliff Sui (2005) Senior Design
15. Graig Dana (2005) Special Problems, currently PhD candidate, Chemical Engineering, UC Berkeley
16. Tanvy Goel (2005) Princeton Day School, High School Junior

#### Courses Taught

- Biomedical Engineering Senior Design (Department of Biomedical Engineering, Senior class, Fall '09, Spring '10)
- Introduction to Biomedical Engineering (Biomedical Engineering Department. Sophomore class. Fall '05, '06, '07, '08, '09)
- Introduction to Biochemical Engineering (Chemical & Biochemical Engineering Department. Senior class. Fall '07, '08, '09)
- Biomedical Thermodynamics and Kinetics (Biomedical Engineering Department. Junior class. Spring '06, '07, '08)
- Topics in Computational Biology (Department of Cell and Developmental Biology, Graduate Elective, Fall '08)
- Computational Systems Biology (Biomedical Engineering Department. Senior class. Spring '06, '07)
- Freshman Orientation (Biomedical Engineering Department Representative. Freshman. Fall '06, '07)

## SERVICE

- Undergraduate Program Director, Biomedical Engineering Department (2008- )
- Chair, Undergraduate Curriculum Reform Committee, Biomedical Engineering Department (2008-)
- Faculty Advisor, Biomedical Engineering Society, Rutgers University Chapter (2006-)
- Faculty Advisor, *Honors Academy*, Biomedical Engineering Department (2006-2008)
- Faculty Advisor, *QXE Honors Society*, Chemical Engineering Honors Society (2007 -)
- Member Committee on Committees, School of Engineering, Rutgers University (2006 - )
- Faculty Advisor, *Tissue & Molecular Engineering Track*, Biomedical Engineering Department (2006 -)
- Graduate Admission Committee, Biomedical Engineering Department (2007)
- Graduate Admission Committee, Chemical Engineering Department (2006, 2007)
- Faculty Advisor, *Biomedical Engineering Student Society* (2006-present)
- Faculty Advisor, *Governors Summer School*, School of Engineering, Rutgers University (2006)
- Organizing Committee *New Jersey Biomedical Engineering Showcase* 2006.

## RESEARCH FUNDING

### Active and Completed

#### *NIH ARRA Supplement*

Parent Grant: Number: R01GM082974

Bioinformatics Analysis of Control Mechanisms of Hypermetabolism

Period: 09/01/09 – 08/31/11, Amount: \$303,000

**Role: Principal Investigator**

*National Institutes of Health*, Grant Number: R01GM082974

Bioinformatics Analysis of Control Mechanisms of Hypermetabolism

Period: 09/01/08 – 08/31/12, Amount: \$1,300,000

**Role: Principal Investigator**

#### *NIGMS Administrative Supplement*

Parent Grant: R01 GM 34695, Lowry, S.F. (PI)

Hormone and Cytokine Regulation of Endotoxin Injury

Period: 07/01/09 – 06/31/10, Amount: \$88,992

**Role: Principal Investigator** (Rutgers University Subcontract)

*National Science Foundation*, Grant Number: 0836422

Reactive Flow Simulation Using an Adaptive Chemistry Framework

Period: 09/01/07-08/031/10 Amount: \$316,000

**Role: Principal Investigator**

*National Science Foundation*, Grant Number: 0836422 Supplemental Award

Reactive Flow Simulation Using an Adaptive Chemistry Framework

Period: 09/01/09-08/31/10, Amount: \$53,000

**Role: Principal Investigator**

**National Science Foundation**, Grant Number: 0836422 Supplemental Award  
Reactive Flow Simulation Using an Adaptive Chemistry Framework  
Period: 09/01/08-08/31/09, Amount: \$46,871  
**Role: Principal Investigator**

**Clinical and Translational Sciences Pilot Award, UMDNJ**  
Analytical Deconvolution of Total Leukocyte Gene Expression Analysis to Reveal Expression Motifs of Individual Leukocyte Subpopulations  
Period: 09/01/08-08/31/09, Amount: \$25,000  
**Role: co-Principal Investigator**

**Charles & Johanna Busch Memorial Fund, Rutgers University**  
Modeling the dynamics of gene expression in monocytes from LPS-challenged healthy humans pre-treated with cortisol  
Period 7/1/07-6/30/09, Amount: \$50,000  
**Role: Principal Investigator**

**Environmental Protection Agency**, Grant Number: EPA-GAD R 832721-010  
Environmental Bioinformatics and Computational Toxicology Center  
Period: 09/01/05 – 10/31/10, Amount: \$435,983  
**Role: co- Principal Investigator**

**Office of Naval Research**  
Efficient Characterization of Complex Reaction Networks  
Period: 07/01/06-06/30/09, Amount: \$150,000  
**Role: co- Principal Investigator**

**ExxonMobil Research and Engineering Knowledge Built Award**  
Analysis of Complex Kinetic Networks & Complex Systems  
Period 05/01/06-04/30/09, Amount: \$135,000  
**Role: Principal Investigator**

**National Science Foundation**, Grant Number: NSF-0519563  
Molecular Network Controls of Hepatocyte Metabolism  
Period: 09/13/05 – 08/31/08, Amount: \$667,851  
**Role: co- Principal Investigator**

## **Pending**

**National Institutes of Health**, Grant Number: R01EB011255-01  
A Multi-scale Model for the Assessment of Autonomic Dysfunction in Human Endotoxemia  
Amount: \$1,300,000  
**Role: Principal Investigator**

**NIGMS Administrative Supplement**  
Parent Grant: R37 GM024211-33, Jusko, W.J. (PI)  
Corticosteroid Pharmacokinetics and Pharmacodynamics  
Amount: \$680,000  
**Role: Principal Investigator** (Rutgers University Subcontract)

