RUDIYANTO (RUDI) GUNAWAN

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EMPLOYMENT HISTORY:

Aug 2018 – present	Associate Professor, University at Buffalo
Jun 2014 – Jul 2018	Group Leader, Swiss Institute of Bioinformatics
Feb 2011 – Jul 2018	Assistant Professor, ETH Zurich
Aug 2006 – Jan 2011	Assistant Professor, National University of Singapore
Jun 2008 – Dec 2010	Singapore-MIT Alliance Fellow, Chemical & Pharmaceutical Engineering
Jun 2007 – May 2008	Singapore-MIT Alliance Visiting Professor
Aug 2003 – Jul 2006	Postdoctoral Fellow, University of California Santa Barbara
Aug 1998 – Jul 2003	Research Assistant, University of Illinois Urbana-Champaign
Fall 2000	Lecturer, University of Illinois Urbana-Champaign
Jan 1999 – Dec 2000	Teaching Assistant, University of Illinois Urbana-Champaign

EDUCATION:

Ph.D.   University of Illinois Urbana-Champaign   2003
Major: Chemical Engineering
Thesis title: Modeling and Control of Transient Enhanced Diffusion of Boron in Silicon

M.S.   University of Illinois Urbana-Champaign   2000
Major: Chemical Engineering
Thesis title: Robustness Analysis of Time Delay Systems

B.S.   University of Wisconsin – Madison   1998
Major: Chemical Engineering and Mathematics

RESEARCH INTERESTS

- Expertise: systems biology, bioinformatics, computational biology, mathematical modeling, systems analysis, design of experiments, network inference, process optimization
- Applications: biogerontology, biopharmaceutical manufacturing, monoclonal antibody, protein glycosylation, drug discovery and repurposing, mitochondrial DNA, programmed cell death, systems pharmacology, stem cell differentiation

HONORS AND AWARDS

- Best Theory/Methodology Paper 2005-2008, Journal of Process Control, Elsevier (2008)
- Best Paper of 2006, Computers and Chemical Engineering (2008)
- UIUC Graduate Student Travel Grant (2002)
- University of Wisconsin Dean's List (1994-1998)
- University of Wisconsin Hotaling Scholarship (1997)

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS

Editorial Board Memberships
- Member of Editorial Board: *Processes*
- Member of Editorial Advisory Board: *Industrial & Engineering Chemistry Research* (2014-2017)

Professional Society Memberships

- Member, American Institute of Chemical Engineers (AIChE)
- Member, Institute Society for Computational Biology
- Member, Society for Biological Engineering

Conference and Symposium Committee Memberships
- Scientific Committee, International Conference on Systems Biology (ICSB) 2018, Lyon, France.
- International Federation of Automatic Control (IFAC) TC 6.1 Working Group Chair for Systems Biology, August 2017 – present.
- Organizing Committee, Foundations of Systems Biology in Engineering (FOSBE), Chicago, USA, 5-8 August 2018.
- Organizing Committee, 15th International Conference on Molecular Systems Biology, Munich, Germany, 2017.
- Area chair International Programming Committee, Foundations of Systems Biology in Engineering (FOSBE), Magdeburg, Germany, 2016.
- Scoring review panel, *sbvImprover Systems Toxicology Challenge*, Philip-Morris International, starting May 2015.
- Scoring review panel, *sbvImprover Species Translational Challenge*, Philip-Morris International, March-December 2013.
- Organizing Committee, *International Symposium on Advanced Control of Chemical Processes (ADCHEM)*, Singapore, July 2012
- Organizing Committee, *5th International Symposium on Design, Operation and Control of Chemical Processes,* Singapore, July 2010
- Programming Committee, *3rd International Conference on Bioinformatics and Systems Biology (BSB)*, Chongqing, China, July 2010
- Programming Committee, *International Conference on Molecular Systems Biology (ICMSB)*, UP Diliman, Philippines, February 2008.

RESEARCH SUPERVISION
Current PhD Students
1. Mahmut Kamil Aslan (co-supervised with Prof. Andrew deMello, ETH Zurich)
2. Nan Papili Gao
3. Sudharshan Ravi
4. Saber Meamardoost
5. Panagiotis Chrysinas

Current Masters Students
6. Jillian Annis
7. Qi Xin
8. Zhixin Zong

Former PhD students
1. Nadia Vertti Quintero, PhD 2018. Thesis title: "*In vivo* dynamic characterization of heat shock response in *Caenorhabditis elegans* using high-throughput microfluidic systems and mathematical modelling". (currently Postdoc at ETH Zurich)
2. Heeju Noh, PhD 2017. Thesis title: "Network Perturbation Analysis for Inferring Compound Targets from Gene Expression Profiles". (currently Postdoc at Columbia University, New York, NY)
3. Sandro Hutter, PhD 2017. Thesis title: "Flux Analysis of Protein Glycosylation in Mammalian Cell Culture". (currently Scientific Account Manager at Genedata, Basel, Switzerland)
4. Y. Liu, PhD 2016. Thesis title: "Ensemble Modeling and Optimization of Bioprocesses under Uncertainty". (currently Quantitative Analyst at Vontobel, Zurich, Switzerland)

5. S. M. M. Ud-Dean, PhD 2016. Thesis title: "Inferability and Inference of Gene Regulatory Networks" (currently Postdoc at Columbia University, NY)
6. Lakshminarayanan Lakshmanan, PhD 2014. Thesis title: "Direct Repeats and Deletions in Mitochondrial DNA: Causal and Evolutionary Aspects". (currently post-doc with CABSEL)
7. Zhi Yang Tam, PhD 2013. Thesis title: "Mitochondrial Dynamics and Quality Control in Ageing" (currently Principal Data Scientist at Rio Tinto, Singapore)
8. Gengjie Jia, PhD 2012. Thesis title: "Metabolic Network Model Identification – Parameter Estimation and Ensemble Modeling" (currently Postdoc at University of Chicago, Chicago, IL).
9. Thanneer Malai Perumal, PhD 2012. Thesis title: "Dynamical Sensitivity Analysis of Kinetic Models in Biology" (currently at Senior Research Scientist at Sage Bionetworks, Seattle, WA).
10. Sridharan Srinath, PhD 2012. Thesis title: "Model Identification in the Biochemical Systems Theory" (currently Senior Research Fellow at Saw Swee Hock School of Public Health, NUS).
11. Suresh Kumar Poovathingal, PhD 2011. Thesis title: "Systems Biology of Aging: Modeling and Analysis of Mitochondrial Genome Integrity" (currently Staff Scientist at VIB-KU Leuven Center for Brain & Disease Research).

Former Masters Students
12. Anar Alshanbayeva, M.S. 2017. Thesis title: "Design and fabrication of a microfluidic system for single cell maintenance, lineage tracking and recovery".
13. Dario Lepori, M.S., 2017. Thesis title: "Glycosylation Flux Analysis of CHO cells".
14. Ziyi Hua, M.S., 2017. Thesis title: "Elucidating Mechanism of Action of Influenza Viral Infection using Network Inference Methods on Time Series Transcriptomics Data".
15. Juerg Hartmann, M.Eng, 2016. Thesis title: "Sensitivity Analysis of Multiscale Stochastic-Deterministic Muscle Fiber Model".
16. Ang Kok Siong, M.Eng, 2010. Thesis title: "Parameter Estimation of Oscillatory Biological Systems".

Former Postdoctoral Students
17. Erica Manesso, Postdoc 10/2013-10/2015 (currently at Bayer Crop Sciences, Germany)
18. Manuel Alberto Garcia Albornoz, Postdoc 11/2014-12/2015 (currently Research Associate at The Francis Crick Institute, UK)

Former Research Assistants
19. Thomas Hartmann, M.S. (currently at abaQon AG)
20. Peter Ruppen, M.S. (currently at Novartis)
21. Tao Fang, M.S. (currently at Roche)

PUBLICATIONS (*senior author, ^ advisees and/or members of Gunawan group)

Refereed Journal Publications:

1. S. Hutter^, M. Wolf, N. Papili Gao^, D. Lepori^, T. Schweigler^, M. Morbidelli and R. Gunawan*. Glycosylation flux analysis of immunoglobulin G in Chinese hamster ovary perfusion cell culture. *Processes*, 6:176, 2018. (invited feature article)
2. T. Baasch, P. Reichert, S. Lakämper, N. Vertti-Quintero^, G. Hack, X. Casadevall i Solvas, A. deMello, R. Gunawan and J. Dual*. Acoustic compressibility of *Caenorhabditis elegans*. *Biophysical Journal*, 115:1817-1825, 2018.
3. L. Lakshmanan^, Z. Yee, R. Gunawan*, B. Halliwell and J. Gruber*. Clonal expansion of mitochondrial DNA deletions is a private mechanism of ageing in long-lived animals. *Aging Cell*, 17:e12814, 2018.

4. H. Noh^, J. Shoemaker and R. Gunawan*. Network perturbation analysis of gene transcriptional profiles reveals protein targets and mechanism of action of drugs and influenza A viral infection, *Nucleic Acids Research*, 6:e34, 2018.

5. T. M. Perumal^ and R. Gunawan*. Elucidating cellular population dynamics by molecular density function perturbations, *Processes,* 6: 9, 2018. (special issue on Biological Networks, cover page)

6. N. Papili-Gao^, S.M.M. Ud-Dean^, O. Gandrillon and R. Gunawan*. SINCERITIES: Inferring gene regulatory networks from time-stamped single cell transcriptional expression profiles, *Bioinformatics*, 34:258-266, 2018.

7. S. Kyriakopoulos, M. Lakshmanan, K.S. Ang, Z. Huang, S. Yoon, R. Gunawan and D.-Y. Lee*. Kinetic modeling of mammalian cell culture bioprocessing: the quest to advance biomanufacturing, *Biotechnology Journal*, 13:e1700229, 2018.

8. E. Manesso^, S. Sridharan^ and R. Gunawan*, Multi-objective optimization of experiments using curvature and Fisher information matrix, *Processes,* 5:63, 2017. (special issue on Biological Networks)

9. S. Hutter^, T. K. Villiger, D. Bruhlmann, M. Stettler, H. Broly, M. Soos and R. Gunawan*. Glycosylation flux analysis reveals dynamic changes of intracellular glycosylation flux distribution in chinese hamster ovary fed-batch cultures, *Metabolic Engineering*, 43(A):9-20, 2017.

10. R. Gunawan* and S. Hutter^. Assessing and resolving model misspecifications in metabolic flux analysis, *Bioengineering*, 4:48, 2017.

11. Y. Liu^ and R. Gunawan*. Bioprocess optimization under uncertainty using ensemble modeling. *Journal of Biotechnology*, 244:34-44, 2017.

12. A. Richard, L. Boullu, U. Herbach, A. Bonnafoux, V. Morin, E. Vallin, A. Guillemin, N. Papili Gao^, R. Gunawan, J. Cosette, O Arnaud, J. Kupiec, T. Espinasse, S. Gonin-Giraud and O. Gandrillon*. A surge in cell-to-cell molecular variability precedes the commitment in a differentiation process. *PLoS Biology*, 14: e1002585, 2016. (top 50 most downloaded article in 2016. Media coverage (French): http://huet.blog.lemonde.fr/2016/12/27/le-modele-darwinien-dynamite-la-genetique/)

13. S.M.M Ud-Dean^, S. Heise, S. Klamt and R. Gunawan*. TRaCE+: Ensemble inference of gene regulatory networks from gene knock-out experiments, *BMC Bioinformatics*, 17:252, 2016.

14. H. Noh^ and R. Gunawan*. Inferring gene targets of drugs and chemical compounds from gene expression profiles*, Bioinformatics*, 32:2120-2127, 2016.

15. S.M.M Ud-Dean^ and R. Gunawan*. Optimal design of gene knock-out experiment for gene regulatory network inference, *Bioinformatics*, 32:875-883, 2016.

16. K. Sriyudthsak, H. Uno, R. Gunawan and F. Shiraishi*. Using dynamic sensitivities to characterize metabolic reaction systems. *Mathematical Biosciences*, 269:153-163, 2015.

17. Y. Liu^, E. Manesso^ and R. Gunawan*. REDEMPTION: Reduced dimension ensemble modeling and parameter estimation, *Bioinformatics*, 31:3387-3389, 2015.

18. L. N. Lakshmanan^, J. Gruber, B. Halliwell, and R. Gunawan*. Are mutagenic non-D-loop direct repeat motifs in mitochondrial DNA under a negative selection pressure? *Nucleic Acids Research*, 43:4098-4108, 2015.

19. Z. Tam^, J. Gruber, B. Halliwell, and R. Gunawan*. Context-dependent role of mitochondrial fusion-fission in clonal expansion of mitochondrial DNA mutations. *PLoS Computational Biology*, 8:e76230, 2015.

20. Y. Liu^ and R. Gunawan*. Parameter Estimation of Dynamic Biological Network Models using Integrated Fluxes, *BMC Systems Biology*, 8:127, 2014.

21. S.M.M. Ud-Dean^ and R. Gunawan*. Ensemble Inference and Inferability of Gene Regulatory Networks, *PLoS One,* 9(8): e103812, 2014.

22. C. Siegenthaler^ and R. Gunawan*. Assessment of Network Inference Methods: How to cope with an underdetermined problem, *PLoS One*, 9(3):e90481, 2014.

23. T. M. Perumal^ and R. Gunawan*. PathPSA: a dynamical pathway-based sensitivity analysis. *Industry & Engineering Chemistry Research*, 53:9149-9157, 2014.

24. Z. Tam^, J. Gruber, L. F. Ng, B. Halliwell, and R. Gunawan*. Effects of lithium on age-related decline in mitochondrial turnover and function in *Caenorhabditis elegans*. *Journal of Gerontology A Biological Science & Medical Sciences*, 69:810-820, 2014.

25. Z. Tam^, J. Gruber, B. Halliwell, and R. Gunawan*. Mathematical modeling of the role of mitochondrial fusion-fission in mtDNA maintenance. *PLoS One*, 8:e76230, 2013.

26. T. M. Perumal^ and R. Gunawan*. Reduction of kinetic models using dynamic sensitivities. *Computers and Chemical Engineering*, 56:37-45, 2013.

27. G. Jia^, G. N. Stephanopoulos and R. Gunawan*. Incremental parameter estimation of kinetic metabolic network models. *BMC Systems Biology*, 6:142, 2012.

28. G. Jia^, G. N. Stephanopoulos and R. Gunawan*. Ensemble kinetic modeling of metabolic networks from dynamic metabolic profiles. *Metabolites,* 2(4):891-912, 2012.

29. S. K. Poovathingal^, J. Gruber, L. N. Lakshmanan^, B. Halliwell, and R. Gunawan*. Is mitochondrial DNA turnover slower than commonly assumed? *Biogerontology*, 13:557-564, 2012.

30. A. I. Toldy, A. Z. M. Badruddoza, Z. Lu, T. A. Hatton, R. Gunawan, R. Rajagopalan, and S. A. Khan*. Spherical crystallization of glycine from monodisperse microfluidic emulsions. *Crystal Growth and Design*, 12:3977-3982, 2012.

31. L. N. Lakshmanan^, J. Gruber, B. Halliwell, and R. Gunawan*. Role of direct repeat and stem-loop motifs in mtDNA deletions: cause or coincidence? *PLoS One*, 7:e35271, 2012.

32. S. Poovathingal^, J. Gruber, L. F. Ng, B. Halliwell, and R. Gunawan*. Maximizing signal to noise ratio in the random mutation capture assay. *Nucleic Acids Research*, doi:10.1093/nar/gkr1221, 2011.

33. G. Jia^, G. N. Stephanopoulos and R. Gunawan*. Parameter estimation of kinetic models from metabolic profiles: Two-phase dynamic decoupling method. *Bioinformatics*, 27:1964-1970, 2011.

34. T. M. Perumal^ and R. Gunawan*. Understanding dynamics using sensitivity analysis: caveat and solution. *BMC Systems Biology*, 5:41, 2011

35. Z. Y. Tam^, Y. H. Cai^ and R. Gunawan*. Elucidating cytochrome C release from mitochondria: insights from an *in silico* three-dimensional model. *Biophysical Journal*, 99:3155-3163, 2010. (cover article)

36. S. K. Poovathingal^ and R. Gunawan*. Global parameter estimation of stochastic biochemical systems. *BMC Bioinformatics*, 11:414, 2010.

37. J. Gruber, S. K. Poovathingal^, N. L. Fang, R. Gunawan and B. Halliwell*. *Caenorhabditis elegans* lifespan studies: the challenge of maintaining synchronous cohorts, *Rejuvenation Research*, 13:347-349, 2010.

38. S. Srinath^ and R. Gunawan*. Parameter identifiability of power-law biochemical system models. *Journal of Biotechnology,* 2010. 149:132-140, 2010.

39. S. K. Poovathingal^, J. Gruber, B. Halliwell, and R. Gunawan*. Stochastic drift in mitochondrial DNA point mutations: a novel perspective ex silico. *PLoS Computational Biology*, 5:e1000572, 2009. (featured research Nov 2009, listed in Faculty 1000 Biology)

40. T. M. Perumal^, Y. Wu^, and R. Gunawan*. Dynamical analysis of cellular networks based on the Green's function matrix. *Journal of Theoretical Biology*, 261:248-259, 2009.

41. R. Gunawan*, I. Fusman, and R. D. Braatz. Parallel high-resolution finite volume simulation of particulate processes. *AIChE Journal*, 54:1449-1458, 2008.

42. S. Taylor, R. Gunawan, L. R. Petzold, and F. J. Doyle III*. Sensitivity measures for oscillating systems: application to mammalian circadian gene network. *IEEE Transactions of Automatic Control*, 153:177-188, 2008.

43. R. Gunawan and F. J. Doyle III*. Phase sensitivity analysis of circadian rhythm entrainment. *Journal of Biological Rhythms*., 22:180-194, 2007.

44. R. Gunawan and F. J. Doyle III*. Isochron-based phase response analysis of circadian rhythms. *Biophysical Journal*, 91:2131-2141, 2006.

45. F. J. Doyle III*, R. Gunawan, N. Bagheri, H. Mirsky, and T.-L. To. Circadian rhythm: A natural, robust, multi-scale control system. *Computers and Chemical Engineering*, 30:1700-1711, 2006.

46. R. D. Braatz*, R. C. Alkire, E. G. Seebauer, T. O. Drews, E. Rusli, M. Karulkar, F. Xue, Y. Qin, M. Y. L. Jung and R. Gunawan. A multiscale systems approach to microelectronics processes. *Computers and Chemical Engineering*, 30:1643-1656, 2006.

47. R. D. Braatz*, R. C. Alkire, E. G. Seebauer, E. Rusli, R. Gunawan, T. O. Drews, X. Li, and Y. He. Perspectives on the dynamics and control of multiscale systems. *Journal of Process Control*, 16:193-204, 2006.

48. K. Gadkar, R. Gunawan, and F. J. Doyle III*. Iterative approach to model identification of biological networks. *BMC Bioinformatics*, 6:155-174, 2005.

49. R. Gunawan, Y. Cao, L. Petzold, and F. J. Doyle III*. Sensitivity analysis of discrete stochastic system. *Biophysical Journal,* 88:2530-2540, 2005.

50. M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. Pair diffusion and kick-out: Contributions to diffusion of boron in silicon. *AIChE Journal*, 50:3248-3256, 2004.

51. R. Gunawan, I. Fusman, and R. D. Braatz*. High resolution algorithms for multidimensional population balance equations. *AIChE Journal* 50:2738-2749, 2004.

52. M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. Effect of near-surface band bending on dopant profiles in ion-implanted silicon. *Journal of Applied Physics*, 95:1134-1140, 2004.

53. M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. A simplified picture for transient enhanced diffusion of boron in silicon. *Journal of Electrochemical Society*, 151:G1-G7, 2004.

54. R. Gunawan, M. Y. L. Jung, E. G. Seebauer, and R. D. Braatz*. Optimal control of rapid thermal annealing in a semiconductor process. *Journal of Process Control*, 14:423-430, 2004.

55. K. Dev, M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. Mechanism for coupling between properties of interfaces and bulk semiconductors. *Physical Review B*, 68:195311-195316, 2003.

56. M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. Ramp-rate effects on transient enhanced diffusion and dopant activation. *Journal of Electrochemical Society*, 150:G838-G842, 2003.

57. R. Gunawan, M. Y. L. Jung, R. D. Braatz, and E. G. Seebauer*. Parameter sensitivity analysis applied to modeling transient enhanced diffusion and activation of boron in silicon. *Journal of Electrochemical Society*, 150:G758-G765, 2003.

58. R. Gunawan, M. Y. L. Jung, E. G. Seebauer, and R. D. Braatz*. Maximum *a posteriori* estimation of transient enhanced diffusion kinetics. *AIChE Journal*, 49:2114-2123, 2003.

59. R. Gunawan, D. L. Ma, M. Fujiwara, and R. D. Braatz*. Identification of kinetic parameters in a multidimensional crystallization process. *International Journal of Modern Physics B*, 16:367-374, 2002.

60. M. Fujiwara, J. C. Pirkle Jr., T. Togkalidou, D. L. Ma, R. Gunawan, and R. D. Braatz*. A holistic approach to materials process design. *Journal of Materials Education.*, 24:65-70, 2002.

61.   R. Gunawan, E. L. Russell, and R. D. Braatz*. Comparison of theoretical and computational characteristics of dimensionality reduction methods for large scale uncertain systems. *Journal of Process Control*, 11:543-552, 2001.

Refereed Conference Proceedings: (*senior author, ^ advisees)

62.   H. Noh^, Z. Hua^ and R. Gunawan*, Inferring causal gene targets from time course expression data, *IFAC-PapersOnLine*, 49 (26): 350-356, 2016.

63.   N. Papili-Gao^, S.M.M. Ud-Dean^ and R. Gunawan*, Gene regulatory network inference using time-stamped cross-sectional single cell expression data, *IFAC-PapersOnLine*, 49 (26): 147-152, 2016.

64.   G. Jia^ and R. Gunawan*, Construction of Kinetic Model Library of Metabolic Networks, In *Proceedings of the 8th IFAC International Symposium on Advanced Control of Chemical Process*, pp. 952-957, 2012.

65.   T.M. Perumal^ and R. Gunawan*. Impulse parametric sensitivity analysis. In *Proceedings of the 18th IFAC World Congress,* pp. 9896-9890, 2011.

66.   G. Jia^ and R. Gunawan*, Construction of Kinetic Model Library of Metabolic Networks from Dynamic Profiles, In *Proceedings of the 8th International Workshop on Computational Systems Biology*, TICSP series #57, pp. 85-88, 2011.

67.   Z. Y. Tam^ and R. Gunawan*, On the Roles of Mitochondrial Fusion-Fission in Mitochondrial Genome Integrity, In *Proceedings of the 8th International Workshop on Computational System Biology*, TICSP series #57, pp. 177-180, 2011.

68.   T.M. Perumal^, Y. Wu^, and R. Gunawan*. Robustness analysis of cellular systems for *in silico* drug discovery. In *Proceedings of the 17th IFAC World Congress*, pp. 12607-12612, 2008.

69.   F. J. Doyle III*, R. Gunawan, N. Bagheri, H. Mirsky, and T.-L. To. Circadian rhythm: A natural, robust, multi-scale control system. In *Proceedings of Chemical Process Control*, Alberta, Canada, January 2006.

70.   R. Gunawan and F. J. Doyle III*. Phase sensitivity analysis of a circadian gene network. In *Proc. of the 44th IEEE Conference on Decision and Control and European Control Conference*, pp. 3687-3692, 2005.

71.   R. Gunawan, M. Y. L. Jung, E. G. Seebauer, and R. D. Braatz*. Optimal control of transient enhanced diffusion. In *Proceedings of the IFAC Symposium on Advanced Control of Chemical Processes*, pp. 547-552, 2003.

72.   R. Gunawan, M. Y. L. Jung, R. D. Braatz and E. G. Seebauer*. Systems analysis applied to modeling dopant activation and TED in rapid thermal annealing. In *Proceedings of the 10th IEEE International Conference on Advanced Thermal Processing of Semiconductors*, pp. 107-110, 2002.

73.   R. Gunawan, E. L. Russell, and R. D. Braatz*. Robustness analysis of multivariable systems with time delays. In *Proceedings of 2001 European Control Conference*, pp. 1882-1887, 2001.

74.   M. Y. L. Jung, R. Gunawan, R. D. Braatz, and E. G. Seebauer*. New physics for modeling transient enhanced diffusion in RTP. In *Rapid Thermal and Other Short-Time Processing Technologies*, vol. 2000-9, pp. 15-20, 2000.

Books and Book Chapters:

75.   R. Gunawan and N. Bagheri (Eds). *Biological Networks*, MDPI, Basel, Switzerland, 2018.

76.   H. Mirsky, J. Stelling, R. Gunawan, N. Bagheri, S. R. Taylor, E. Kwei, J. E. Shoemaker, and F. J. Doyle III*. Automatic Control in Systems Biology. In S. Y. Nof (Ed.), *Handbook of Automation*, Springer-Verlag, 2009.

77. S. Hildebrandt, N. Bagheri, R. Gunawan, H. Mirsky, J. Shoemaker, S. Taylor, L. R. Petzold and F. J. Doyle III*. Systems Analysis in Biological Networks. In E. T. Liu, G. P. Noland, and D. A. Lauffenburger (Eds.), *Systems Biomedicine: Concepts and Perspectives*, Academic Press, 2009.

78. R. Gunawan, K. Gadkar, and F. J. Doyle III*. Methods to identify cellular architecture and dynamics from experimental data. In Z. Szallasi, V. Periwal, and J. Stelling (Eds.), *System Modeling in Cellular Biology*, MIT Press, 2006.

Patent:

79. "Methods for controlling dopant concentration and activation in semiconductor structures" with E. G. Seebauer, R. D. Braatz and M. Y. L. Jung, US Patent 7,846,822, 2010.

Non-refereed Publications;

80. R. Gunawan and N. Bagheri. Special issue on "Biological Networks", *Processes*, 6:242, 2018.

81. J. Dual*, M. Gerlt, P. Hahn, S. Lakaemper, I. Leibacher, A. Lamprecht, P. Reichert, N. S. Vertti Quintero, X. Casadevall i Solvas, R. Gunawan and A. deMello. Ultrasonic robotics in microfluidic cavities, *Journal of Acoustical Society America*, 141:3505, 2017.

82. N. Bagheri and R. Gunawan*. Introduction to Editorial Board Member: Professor Francis J. Doyle III. *Bioengineering & Translational Medicine*, 2017. DOI: 10.1002/btm2.10054

*Preprints***:**

83. L. Lakshmanan^, Z. Yee, J. Gruber, B. Halliwell, and R. Gunawan*. Thermodynamic analysis of mitochondrial DNA breakpoints reveals mechanistic details of deletion mutagenesis. *bioRxiv*, 254631, 2018.

84. N. Papili Gao^, T. Hartmann^ and R. Gunawan*. CALISTA: Clustering and lineage inference in single-cell transcriptional analysis. *bioRxiv*, 257550, 2018.

RESEARCH PRESENTATIONS (underlined names indicate speakers)

Invited Seminars and Talks:

1. R. Gunawan. Integrating Human Transcriptomics and Phenomics for Understanding the Biology of Aging, to be given at *the 1ˢᵗ Initiative for Biological Systems Engineering (IBSE) International Symposium*, Chennai, India, 24 January 2018. (keynote talk)

2. R. Gunawan. Extracting insights from biological data using network analysis, presented at Department of Chemical and Biological Engineering, SUNY Buffalo, Buffalo, NY, 6 November 2017. (invited seminar)

3. R. Gunawan. Extracting insights from biological data using network analysis, presented at Department of Chemical and Petroleum Engineering, University of Pittsburgh, Pittsburgh, PA, 27 October 2017. (invited seminar)

4. R. Gunawan. Mitochondrial DNA mutations in ageing, presented at Center for Bioengineering, University of California Santa Barbara, Santa Barbara, CA, 8 November 2016. (invited seminar)

5. R. Gunawan. Gene regulatory network inference using single cell expression data, presented at *6ᵗʰ IFAC Conference on Foundations of Systems Biology in Engineering*, Magdeburg, Germany, 10 October 2016. (keynote lecture)

6. R. Gunawan. Tackling uncertainty in bioprocess modeling and optimization, presented at *Department of Biotechnology, Delft University*, Delft, Netherlands, 5 October 2016. (invited seminar)

7.   R. Gunawan. Elucidating mechanism of action by network inference and analysis, presented at *Biomedical Institute for Global Health Research and Technology (BIGHEART)*, National University of Singapore, Singapore, 23 September 2016. (invited seminar)

8.   R. Gunawan, Mitochondrial DNA mutations and ageing, presented at *CSIC Instituto de Investigaciones Marinas*, Vigo, Spain, 13 June 2016. (invited seminar)

9.   R. Gunawan, Coping with underdetermined biological network inference. In *Platform for Advanced Scientific Computing*, 9 June 2016. (invited talk)

10. R. Gunawan, Causal inference in systems biology, presented at *Department of Chemical and Biomolecular Engineering,* National University of Singapore, Singapore, 18 April 2016. (invited seminar)

11. R. Gunawan, Infering causal targets and influence in systems biology, presented at *Control Theory and Systems Biology Laboratory*, *Department of Biosystems Science and Engineering*, ETH Zurich, Basel, Switzerland, 4 April 2016. (invited seminar)

12. R. Gunawan, Ensemble-based design of experiments for biological network inference, *Virtual Swiss Institute of Bioinformatics Computational Biology Seminar Series,* Lausanne, Switzerland, 14 October 2015. (invited seminar)

13. R. Gunawan, REDEMPTION: Reduced dimension ensemble modeling and parameter estimation, presented at *Department of Bioscience and Biotechnology*, *Kyushu University*, Fukuoka, Japan, 14 September 2015. (invited seminar)

14. R. Gunawan, Mitochondrial DNA Mutations and Ageing: Insights from *in silico* modeling and analysis, presented at *RIKEN*, Yokohama, Japan, 11 September 2015. (invited seminar)

15. R. Gunawan, Ensemble-based optimal design of experiments for biological network identification, presented at *Process Systems Engineering Laboratory, Department of Chemical Engineering, MIT*, Boston, MA, USA, 14 August 2015. (invited seminar)

16. R. Gunawan, Causal inference in systems biology, presented at *Foundation of Systems Biology in Engineering*, Boston, MA, USA, 9-12 August 2015. (invited talk)

17. R. Gunawan, Ensemble Modeling based Strategies for Biological Network Inference, presented at *Institute for Automation Engineering (IFAT), Otto-von-Guericke University Magdeburg*, Magdeburg, Germany, 13 January 2015. (invited seminar)

18. R. Gunawan, Inferring Biological Network Structure and Parameters: How to cope with an underdetermined problem, Laboratory of Biological Systems Analysis, Georgia Tech, Atlanta GA, USA, 17 November 2014. (invited seminar)

19. R. Gunawan, Mitochondrial DNA Mutations and Ageing: Mutagenesis and Clonal Expansion, Northwestern Institute on Complex Systems (NICO), Northwestern University, Evanston, IL, USA, 6 November 2014. (invited seminar)

20. R. Gunawan, Direct Repeats and Deletions in Mitochondrial DNA: Causal and Evolutionary Aspects, SwissMito Meeting 2014, Kandersteg, Switzerland, 3 September 2014. (invited talk)

21. R. Gunawan, Inference of Biological Network Structure and Parameters: How to Cope with an Underdetermined Problem, Laboratory of Chemical Technology, Universitaet Gent, Ghent, Belgium, 18 July 2014. (invited seminar)

22. R. Gunawan, Inference of Biological Network Structure and Parameters: How to Cope with an Underdetermined Problem, Process Systems Engineering Seminar, MIT, Cambridge, MA, USA, 10 July 2014. (invited seminar)

23. R. Gunawan, Methods for Constructing Biological Network Models, Biochemtex, Tortona, Italy, 25 March 2014. (invited talk)

24. R. Gunawan, Mitochondrial DNA and Ageing: When and How. Institute for Systems Theory and Automatic Control, University of Stuttgart, 19 January 2012. (invited seminar)

25.   R. Gunawan, Toward Genome Scale Kinetic Modeling of Metabolic Networks, presented at *Safety and Environmental Technology Group, ETH Zurich,* 24 November 2011. (invited seminar)

26.   R. Gunawan, Mitochondrial Ageing: New insights *ex silico*, presented at *Department of Information Technology and Electrical Engineering, ETH Zurich*, 12 April 2011. (invited seminar)

27.   T. M. Perumal and R. Gunawan, Dynamical Analysis and Model Reduction of Complex Systems, presented at *the 13th Asia Pacific Confederation of Chemical Engineering Congress* (APCChE), Taipei, October 5-8, 2010. (keynote lecture)

28.   R. Gunawan, Systems Modeling and Analysis of Mitochondria Physiology: Cell Death and Aging, presented at *Institute for Chemical and* Bioengineering, ETH Zurich, July 2010. (invited seminar)

29.   R. Gunawan, The Yin and Yang of Systems Biology, presented at *Department of Chemical and Biomolecular Engineering, National University of Singapore*, Singapore, 2006. (invited seminar)

30.   R. Gunawan, Systems Biology: New Frontiers for Systems Engineering, presented at *School of Chemical Engineering, Purdue University*, USA, 2006. (invited seminar)

31.   R. Gunawan, Systems Biology: New Frontiers for Systems Engineering, presented at *Department of Chemical Engineering, University of Florida-Gainesville*, USA, 2006. (invited seminar)

32.   R. Gunawan, Systems Biology: New Frontiers for Systems Engineering, presented at *Department of Chemical Engineering, Massachusetts Institute of Technology,* USA, 2006. (invited seminar)

33.   R. Gunawan, Systems Biology: New Frontiers for Systems Engineering, presented at *Graduate Program in Bioinformatics, Boston University*, USA, 2006. (invited seminar)

34.   R. Gunawan, Systems Biology: New Frontiers for Systems Engineering, presented at *Department of Chemical Engineering, University of Texas at Austin*, USA, 2006. (invited seminar)

35.   R. Gunawan, The Yin and Yang of Systems Biology, presented at *Division of Chemical and Biomolecular Engineering, Nanyang Technological University*, Singapore, 2005. (invited seminar)

36.   R. Gunawan, Modeling and Control of Transient Enhanced Diffusion of Boron in Silicon, presented at *Department of Chemical Engineering, Auburn University*, USA, 2003. (invited seminar)

37.   R. Gunawan, Modeling and Control of Transient Enhanced Diffusion of Boron in Silicon, presented at *Department of Chemical Engineering, Lehigh University*, USA, 2003. (invited seminar)

Conference, Symposium and Public Talks:

38.   N. Papili Gao and R. Gunawan. Imputation of single-cell expression data, presented at *AIChE Annual Meeting*, Pittsburgh, PA, 31 October 2018.

39.   S. Ravi and R. Gunawan. Metabolic Network Analysis for Understanding the Biology of Aging, presented at *AIChE Annual Meeting*, Pittsburgh, PA, 28 October 2018.

40.   H. Noh and R. Gunawan. Identifying molecular targets of drugs using an integrative network analysis of protein-protein and protein-DNA and transcriptomics data, presented at *AIChE Annual Meeting*, Minneapolis, MN, 2 November 2017.

41.   N. Papili Gao and R. Gunawan. A two-state model-based cell clustering and network inference for single-cell gene expression data, presented at *AIChE Annual Meeting*, Minneapolis, MN, 31 October 2017.

42.   R. Gunawan and S. Hutter. Model misspecifications in Metabolic Flux Analysis: Biases, test and fixes, presented at *AIChE Annual Meeting*, Minneapolis, MN, 30 October 2017.

43.   R. Gunawan and S. Hutter. Model misspecifications in Metabolic Flux Analysis: Assessment and resolution, presented at *15th International Conference on Molecular Systems Biology*, Raitenhaslach, DE, 27 July 2017.

44. S. Hutter, D. Lepori, M. Wolf, and R. Gunawan. Glycosylation flux analysis of mammalian perfusion cell culture, presented at *15th International Conference on Molecular Systems Biology*, Raitenhaslach, DE, 27 July 2017.

45. H. Noh, J. Shoemaker and R. Gunawan. Identifying molecular targets of drugs using an integrative network analysis of molecular interactions and transcriptomics data, presented at *Platform for Advanced Scientific Computing (PASC)*, Lugano, Switzerland, 28 June 2017. (winner of FOMICS PhD student prize)

46. S. Ravi and R. Gunawan. Bioinformatics analysis for understanding the biology of ageing, presented at *the Genotype Tissue Expression (GTEx) Project Community Meeting*, Barcelona, Spain, 21 April 2017.

47. Y. Liu and R. Gunawan. Bioprocess optimization under uncertainty using ensemble modeling, presented at *AIChE Annual Meeting*, San Francisco, CA, 16 November 2016.

48. S. Hutter, D. Karst, T. Schweigler, M. Morbidelli and R. Gunawan. Analyzing protein glycosylation in mammalian perfusion cell culture using glycosylation flux analysis, presented at *AIChE Annual Meeting*, San Francisco, CA, 16 November 2016.

49. N. Papili-Gao, S.M.M. Ud-Dean and R. Gunawan. Inferring gene regulatory networks from single cell expression data, presented at *AIChE Annual Meeting*, San Francisco, CA, 15 November 2016.

50. H. Noh, Z. Hua and R. Gunawan. Inferring molecular targets and mechanism of action from time course expression data, presented at *9th RECOMB/ISCB Conference on Regulatory and Systems Genomics*, Phoenix, AZ, 7 November 2016.

51. H. Noh, Z. Hua and R. Gunawan. Inferring causal gene targets from time course expression data, presented at *6th IFAC Conference on Foundations of Systems Biology in Engineering*, Magdeburg, Germany, 12 October 2016.

52. N. Vertti-Quintero, X. Casadevall i Solvas, O. Dressler, S. Stavrakis, J. Gruber, R. Gunawan and A. deMello. A microfluidic platform for the study and characterization of intrinsic stochastic variability in the stress response system of *C. elegans*, presented at *Microfluidics – EMBL Conference*, Heidelberg, Germany, 24 July 2016.

53. S. Hutter, T. K. Villiger, D. Brühlmann, M. Stettler, H. Broly, M. Morbidelli, and R. Gunawan, Dynamic glycosylation flux analysis, presented at *6th Conference on Systems Biology of Mammalian Cells*, Helmholtz Zentrum, Munich, Germany, 6-8 April 2016.

54. H. Noh and R. Gunawan, Inference targets of compounds from gene transcriptional profiles. In *Systems Toxicology*, Les Diablerets, Switzerland, 27-29 January 2016.

55. H. Noh and R. Gunawan, Inferring gene regulatory network perturbations from expression data, presented at *Biochemical Systems Theory Conference*, Fukuoka, Japan, 16-17 September 2015.

56. R. Gunawan, REDEMPTION: Reduced dimension ensemble modeling and parameter estimation*, presented at *Foundation of Systems Biology in Engineering, Training Workshop*, Boston, MA, USA 8 August 2015.

57. R. Gunawan, Ageing *in silico*: Using computational chemistry to understand the biology of ageing, Tag der offennen Laboratorien, DCHAB, ETH Zurich, 9 June 2015. (public lecture)

58. E. Manesso and R. Gunawan, A Bayesian Design of Experiments for Ensemble Modelling of Gene Regulatory Networks, RECOMB/Regulatory Systems Genomics, San Diego, CA, USA, 10-14 November 2014.

59. S. M. Minhaz Ud-Dean and R. Gunawan, Ensemble Inference and Inferability of Gene Regulatory Networks, In the *6th Annual RECOMB/ISCB Conference on Regulatory and Systems Genomics*, Toronto, Canada, 8 – 12 November 2013.

60. R. Gunawan, Ageing *in silico*, Maturadentage, DCHAB, ETH Zurich, 5 September 2013. (public lecture)

61. R. Gunawan, Ageing *in silico*, Tag der offennen Laboratorien, DCHAB, ETH Zurich, 14 June 2013. (public lecture)

62. G. Jia, G. Stephanopoulos and R. Gunawan, Please mind the DOF, In *Frontiers in Systems and Synthetic Biology*, Atlanta, GA, 20-24 March 2013.

63. G. Jia, G. Stephanopoulos and R. Gunawan, Incremental Parameter Estimation and Ensemble Kinetic Modeling of Metabolic Networks, In the *12th AIChE Annual Meeting*, Pittsburgh, PA, 28 October – 2 November, 2012.

64. G. Jia and R. Gunawan, Construction of Kinetic Model Library of Metabolic Networks, In the *8th IFAC International Symposium on Advanced Control of Chemical Processes*, Singapore, 10-13 July 2012.

65. R. Gunawan, Mitochondrial DNA Mutations and Aging: When and How? ETH Zurich Introductory Lecture, 23 April 2012. (public lecture)

66. J. Gengjie, G. N. Stephanopoulos and R. Gunawan, Estimating Kinetic Parameters of Large Scale Metabolic Models, In the *14th Asia Pacific Confederation of Chemical Engineering Congress*, Singapore, 21-24 February, 2012.

67. T. M. Perumal and R. Gunawan, Dynamical Pathway Sensitivity Analysis for Biological Systems, In *AIChE Annual Meeting*, Minneapolis, Minnesota, October 2011.

68. T. M. Perumal and R. Gunawan, Impulse Parametric Sensitivity Analysis, In the *18th World Congress of the International Federation of Automatic Control (IFAC)*, Milano, Italy, August 28 – September 2. 2011.

69. S. Srinath and R. Gunawan, Model-based Design of Experiment for Kinetic Parameter Identification: Beyond the Fisher Information Matrix. In the *13th International Conference on Molecular Systems Biology*, Lleida, Spain, May 2011.

70. S. K. Poovathingal, J. Gruber, B. Halliwell and R. Gunawan, Sarcopenia *in silico*. In *AIChE Annual Meeting*, Salt Lake City, UT, USA, November 2010.

71. T. M. Perumal and R. Gunawan, Dynamical Model Reduction of Large Reaction Mechanisms: A Green's Function Matrix (GFM) Based Approach. In *AIChE Annual Meeting*, Salt Lake City, UT, USA, November 2010.

72. T. M. Perumal and R. Gunawan, Caveats of Parametric Sensitivity Analysis (PSA): In analyzing the dynamics of biological systems. In *AIChE Annual Meeting*, Salt Lake City, UT, USA, November 2010.

73. S. Srinath and R. Gunawan, Parameter Identifiability of Metabolic Network Models, In *Satellite Conference of the International Congress of Mathematics*, Hyderabad, India, August 2010.

74. T. M. Perumal and R. Gunawan, In Analyzing the Complex Dynamics of Biochemical Pathways. In the satellite conference on *Application of Control Theory and Optimization Techniques in Biochemical Pathways*, HICC, Hyderabad, India, August 16-18, 2010.

75. S. Srinath, Y. Zu and R. Gunawan, Identifiability Analysis of Decoupled Power-Law Models, In the *5th International Symposium on Design, Operation and Control of Chemical Processes (PSE Asia)*, Singapore, July 2010.

76. J. Gruber, S. K. Poovathingal, N. L. Fang, R. Gunawan and B. Halliwell, Deceptively simple – considerations regarding *Caenorhabditis elegans* lifespan, ageing and antioxidant studies. *Strategies for Engineered Negligible Senescence (SENS-4)*, Cambridge, England, September 2009.

77. S. Srinath and R. Gunawan. Identifiability analysis of metabolic networks. In *Intl. Conf. of Molecular Systems Biology*, Shanghai, PR China, July 2009.

78. S. Poovathingal, J. Gruber, B. Halliwell, R. Gunawan. Aging Studies: A Stochastic Approach in point mutation dynamics in mouse model. In *AIChE Annual Meeting*, Philadelphia, PA, November 2008.

79. T. M. Perumal, Y. Wu, and R. Gunawan. Robustness analysis of cellular systems for *in silico* drug discovery. In *IFAC World Congress*, Seoul, South Korea, July 2008.

80. R. Gunawan and F. J. Doyle III. Isochron-based phase sensitivity analysis of biological oscillatory systems. In *AIChE Annual Meeting*, Cincinnati, OH, October 2005.

81. R. Gunawan, S. R. Taylor, and F. J. Doyle III. Sensitivity analysis in biological modeling: an application in the model development of staphylococcal enterotoxin B response. In *AIChE Annual Meeting*, Cincinnati, OH, October 2005.

82. R. Gunawan, Y. Cao, L. Petzold, and F. J. Doyle III. Stochastic sensitivity analysis of discrete stochastic biological systems. In *AIChE Annual Meeting*, Austin, TX, November 2004.

83. R. Gunawan, Y. Cao, L. Petzold, and F. J. Doyle III. Stochastic sensitivity analysis of cellular processes. In *Intl. Conf. of Molecular Systems Biology*, Lake Tahoe, CA, August 2004.

84. R. Gunawan, I. Fusman, and R. D. Braatz. High resolution algorithms for multidimensional population balance equations with nucleation and size-dependent growth. In *AIChE Annual Meeting*, San Francisco, CA, November 2003.

85. R. Gunawan, M. Y. L. Jung, E. G. Seebauer, and R. D. Braatz. Maximum *a posteriori* estimation of transient enhanced diffusion kinetics. *AIChE Annual Meeting*, Indianapolis, IN, November 2002.

86. R. Gunawan, M. Y. L. Jung, E. G. Seebauer, and R. D. Braatz. Optimal control of transient enhanced diffusion. *AIChE Annual Meeting*, Indianapolis, IN, November 2002.

87. R. Gunawan, M. Y. L. Jung, R. D. Braatz, and E. G. Seebauer. Systems analysis applied to modeling transient enhanced diffusion. *AIChE Annual Meeting*, Indianapolis, IN, November 2002.

Poster Presentations:

88. N. Papili Gao and R. Gunawan. A likelihood-based single-cell clustering reveals epigenetic landscapes in stem cell differentiation, presented at the 7th Foundation of Systems Biology in Engineering, Chicago, IL, 6 August 2018. (winner of poster award)

89. S. Ravi and R. Gunawan. Metabolic network analysis for understanding the biology of aging, presented at the 7th Foundation of Systems Biology in Engineering, Chicago, IL, 6 August 2018.

90. N. Papili Gao, T. Hartmann and R. Gunawan. Clustering and lineage inference in single cell transcriptional analysis of cell differentiation, presented at the 10th Annual RECOMB/ISCB Conference on Regulatory and Systems Genomics, New York, NY, 19 November 2017

91. N. Papili Gao, T. Hartmann and R. Gunawan. Clustering and lineage inference in single cell transcriptional analysis of cell differentiation, presented at the 10th Annual RECOMB/ISCB Conference on Regulatory and Systems Genomics, New York, NY, 19 November 2017.

92. S. Ravi, M. Garcia-Albornoz and R. Gunawan. Bridging transcriptomics and phenomics in the analysis of human ageing, presented at the Biology of Ageing II, Singapore, 15 November 2017.

93. S. Ravi, H. Narayanan and R. Gunawan. Metabolic network analysis for understanding the biology of ageing, presented at the 15th International Conference on Molecular Systems Biology, Raitenhaslach, DE, 26-28 July 2017.

94. H. Noh, Z. Hua and R. Gunawan, SALMON: A network analysis of transcriptomics data for inferring the molecular targets of compounds, presented at at 15th International Conference on Molecular Systems Biology, Raitenhaslach, DE, 26-28 July 2017. (winner of poster presentation prize)

95. N. Papili Gao, S.M.M. Ud-Dean and R. Gunawan, Inferring gene regulatory networks from time-stamped single cell transcriptional expression profiles, presented at *RECOMB*, Hong Kong, China, 5 May 2017.

96. H. Noh, Z. Hua and R. Gunawan, Identifying molecular targets of drugs from gene transcriptional profiles, presented at *RECOMB*, Hong Kong, China, 5 May 2017.

97. S. Ravi and R. Gunawan, Metabolic network analysis for understanding the biology of ageing, presented at *Drug Discovery Network Zurich*, Zurich, Switzerland, 10 February 2017.

98. H. Noh, Z. Hua and R. Gunawan, Identifying molecular targets of drugs from gene transcriptional profiles, presented at *Drug Discovery Network Zurich*, Zurich, Switzerland, 10 February 2017.

99. N. Vertti-Quintero, X. Casadevall i Solvas, O. Dressler, S. Stavrakis, J. Gruber, R. Gunawan and A. deMello, A microfluidic platform for the study and characterization of dynamic and stochastic expression of heat shock proteins in *C. elegans*, presented at *Symposium Latsis*, EPF Lausanne, Switzerland, 14 November 2016.

100. L.N. Lakshmanan, J. Gruber, B. Halliwell and R. Gunawan. Deletion mutagenesis of mitochondrial DNA, presented at *Cell Fate Diversity in Aging*, Dubrovnik, Croatia, 25-28 September 2016.

101. H. Noh, Z. Hua and R. Gunawan. Elucidating mechanism of drug action and diseases using network perturbations, presented at *15th International Conference on Bioinformatics (InCOB)*, Biopolis (Matrix), Singapore, 21-23 September 2016.

102. N. Vertti-Quintero, X. Casadevall i Solvas, O. Dressler, S. Stavrakis, J. Gruber, R. Gunawan and A. deMello, A microfluidic platform for the study and characterization of intrinsic stochastic variability in the stress response system of *C. elegans*, presented at *Microfluidics – EMBL Conference*, Heidelberg, Germany, 24-26 June 2016.

103. H. Noh and R. Gunawan, Inferring causal gene targets from time course expression data. In *SIB Days*, Biel, Switzerland, 7-8 June 2016.

104. N. Papili-Gao and R. Gunawan, Gene regulatory network inference using cross-sectional single cell data. In *SIB Days*, Biel, Switzerland, 7-8 June 2016.

105. S. Hutter and R. Gunawan, Dynamic glycosylation flux analysis. In *SIB Days*, Biel, Switzerland, 7-8 June 2016.

106. H. Noh and R. Gunawan, Inference targets of compounds from gene transcriptional profiles. In Systems Toxicology, Les Diablerets, Switzerland, 27-29 January 2016.

107. H. Noh and R. Gunawan, Inference of causal gene targets from expression data using ΔNet, In *Drug Discovery Network Zurich Symposium*, Zurich, Switzerland, 10 September 2015.

108. H. Noh and R. Gunawan, Inference of causal gene targets from expression data, In *Foundation of Systems Biology in Engineering*, Boston, MA, USA, 9 – 12 August 2015

109. N. Vertti-Quintero, O. Dreasler, X. Casadevall I Solvas, S. Stavrakis, J. Gruber, R. Gunawan and A. deMello, Microfluidic high-throughput fluorescence-based sorter for studying stochastic expression of heat shock proteins in *C. elegans*. In the 20th *International C. elegans Conference*, Los Angeles, CA, USA, 24-28 June 2015.

110. H. Noh and R. Gunawan, Inference of causal gene targets from expression data, In *Ascona Workshop*, Ascona, Switzerland, 31 May – 5 June 2015.

111. S.M.M. Ud-Dean and R. Gunawan, How to break a network to infer it, In *Ascona Workshop*, Ascona, Switzerland, 31 May – 5 June 2015.

112. S.M.M. Ud-Dean and R. Gunawan, Ensemble Inference and Inferability of Gene Regulatory Networks, In the 22nd Annual International Conference on Intelligent Systems for Molecular Biology, Boston, MA, USA, 13 – 15 July 2014.

113. E. Manesso and R. Gunawan, A Bayesian Design of Experiments for Ensemble Modeling of Metabolic Networks, In Metabolic Engineering X Conference, Vancouver, Canada, 15 – 19 July 2014.

114. Y. Liu, E. Manesso and R. Gunawan, REDEMPTION: Reduced Dimension Ensemble Modeling and Parameter Estimation, In Metabolic Engineering X, Conference, Vancouver, Canada, 15 – 19 July 2014.

115. S.M.M. Ud-Dean and R. Gunawan, Ensemble Inference and Inferability of Gene Regulatory Networks, In the 6th Annual RECOMB/ISCB Conference on Regulatory and Systems Genomics, Toronto, Canada, 8 – 12 November 2013.

116. C. Siegenthaler and R. Gunawan, Assessment of Network Inference Methods: How to cope with and underdetermined problem, In *sbv IMPROVER Symposium*, Athens, Greece, 29-31 October 2013.

117. S. M. Minhaz Ud-Dean and R. Gunawan, Gene Regulatory Network Inference through Transitive Reduction and Closure Estimation, In *Frontiers in Systems and Synthetic Biology*, Atlanta, GA, 20-24 March 2013.

118. S. M. Minhaz Ud-Dean and R. Gunawan, TRACE: Transitive Reduction and Closure Estimate of a Genetic Network, In the *11ᵗʰ European Conference on Computational Biology*, Basel, Switzerland, 9-12 September 2012.

119. S. M. Minhaz Ud-Dean and R. Gunawan, TRACE: Transitive Reduction and Closure Estimate of a Genetic Network, In the *6ᵗʰ International Workshop on Machine Learning in Systems Biology*, Basel, Switzerland, 8-9 September 2012.

120. L. N. Lakshmanan, J. Gruber, and R. Gunawan, Mitochondrial DNA Deletion Mutagenesis in Aging. In *International Conference of Systems Biology*, Toronto, Canada, 19-23 August 2012.

121. Z. Y. Tam, L. F. Ng, R. Gunawan and J. Gruber, Lithium Preserves Mitochondrial Function and Extend Healthspan in *C. elegans*, In the *British Society for Research on Ageing Annual Meeting*, Aston, UK, 3 July 2012.

122. L. N. Lakshmanan, J. Gruber, B. Halliwell and R. Gunawan, Role of Direct Repeats and DNA Misalignments in mtDNA Deletions: Cause or Coincidence? In *Gordon Research Conference on Biology of Aging*, Ventura, California, USA, 12-17 February 2012.

123. G. Jia and R. Gunawan, Construction of Kinetic Model Library of Metabolic Networks from Dynamic Profiles, In the *12ᵗʰ International Conference on Systems Biology*, Heidelberg/Mannheim, Germany, August 28 - September 1, 2011.

124. Z. Y. Tam, J. Gruber, B. Halliwell and R. Gunawan, On the Roles of Mitochondrial Fusion-Fission in Mitochondrial Genome Integrity, In the *12ᵗʰ International Conference on Systems Biology*, Mannheim, Germany, August 28 - September 1, 2011.

125. Z. Y. Tam, J. Gruber, B. Halliwell and R. Gunawan, On the Roles of Mitochondrial Fusion-Fission in Mitochondrial Genome Integrity, In the *Conference on Stochastic Systems Biology*, Monte Verità, Switzerland, July 2011.

126. L. N. Lakshmanan, S. K. Poovathingal, and R. Gunawan, Modeling of Age-associated Mitochondrial DNA Deletions in Mouse Cardiac Tissue. In the *Conference on Stochastic Systems Biology*, Monte Verità, Switzerland, July 2011.

127. L. Lakshmanan, S. K. Poovathingal, and R. Gunawan *, Mouse cardiac tissue modeling of age-associated deletions in mitochondrial genome, In the *8ᵗʰ International Workshop on Computational System Biology*, Zurich, Switzerland, June 2011.

128. G. Jia and R. Gunawan, Parameter Estimation of Kinetic Models from Metabolic Profiles: Two-phase Dynamic Decoupling Method, In the *13ᵗʰ International Conference on Molecular Systems Biology*, Lleida, Spain, May 2011.

129. S. K. Poovathingal, J. Gruber, B. Halliwell and R. Gunawan, Random Drift of Mitochondrial DNA Deletions in Sarcopenia, In *11ᵗʰ International Conference on Systems Biology*, Edinburgh, UK, October 2010.

130. L. N. Lakshmanan, S. K. Poovathingal, J. Gruber, B. Halliwell and R. Gunawan, Elucidating Mechanisms of Age-dependent Accumulation of Mitochondrial DNA Deletions – An *in silico* Approach. In *Gordon Research Conference on Biology of Aging*, Les Diablerets, Switzerland, August 2010.

131. S. Srinath and R. Gunawan, Parameter Identifiability in Kinetic Modeling of Metabolic Pathways, In *Metabolic Engineering Conference VIII*, Jeju Island, South Korea, June 2010.

132. S. K. Poovathingal, J. Gruber, B. Halliwell and R. Gunawan, Stochasticity in mitochondrial DNA point mutations and its relevance in *Caenorhabditis elegans* aging. In *10ᵗʰ International Conference on Systems Biology*, Stanford, CA, September 2009.

133. T.M. Perumal and R. Gunawan, Information transfer in biological network motifs. In *10ᵗʰ International Conference on Systems Biology*, Stanford, CA, September 2009.

134. S. K. Poovathingal and R. Gunawan. A Global Approach for Estimating the Kinetic Parameters of Stochastic Biological Systems. In *Foundations of Systems Biology and Engineering* (FOSBE), Denver, CO, August 2009.

135. <u>T.M. Perumal</u> and R. Gunawan, Information theoretic global robustness analysis of cellular systems: a molecular perturbation approach. In *Foundations of Systems Biology and Engineering* (FOSBE), Denver, CO, August 2009.

136. K. S. Ang and <u>R. Gunawan</u>. Parameter estimation of oscillatory biological systems. In *AIChE Annual Meeting*, Philadelphia, PA, November 2008.

137. <u>T. M. Perumal</u>, Y. Wu, and R. Gunawan. *In silico* dynamical analysis of cellular systems: a molecular perturbation approach. In *Annual International Conference on Research in Computational Molecular Biology* (RECOMB), Singapore, March 2008.

138. <u>S. Poovathingal</u>, J. Gruber, B. Halliwell, R. Gunawan. Aging studies: a stochastic approach. In *Annual International Conference on Research in Computational Molecular Biology* (RECOMB), Singapore, March 2008.

139. <u>K. S. Ang</u> and R. Gunawan. Parameter estimation for oscillatory biological systems. In *Annual International Conference on Research in Computational Molecular Biology* (RECOMB), Singapore, March 2008.

140. T. M. Perumal, Y. Wu, and <u>R. Gunawan</u>. *In silico* dynamical analysis of cellular systems: a molecular perturbation approach. In *10th International Conference on Molecular Systems Biology*, UP Dilliman, Quezon City, Philippines, February 2008.

141. T. M. Perumal, Y. Wu, and <u>R. Gunawan</u>. New *in silico* robustness analysis of cellular systems: a molecular perturbation approach. In *8th International Conference on Systems Biology*, Long Beach, CA, October 2007.

142. <u>R. Gunawan</u>, D. L. Ma, M. Fujiwara, and R. D. Braatz. Identification of kinetic parameters in a multidimensional crystallization process. *Int. Conf. on Materials for Advanced Technologies*, Symposium D: Crystallization and Interfacial Processes, Singapore, July 2001.