

CV of Mario Lauria, PhD, University of Trento (UNITN)

Associate Professor, Department of Mathematics and Centro Interdipartimentale Mente/Cervello (CIMEC)

Vice coordinator, management committee of the L.M. in Data Science.

Member, management committee of the L.M. in Quantitative and Computational Biology.

#### Education

Università di Napoli "Federico II"

- 1992 Laurea (Electrical Engineering)
- 1997 Ph.D. (Electrical and Computer Engineering)

University of Illinois at Urbana-Champaign

- 1996 M.S. (Computer Science)
- 1997-1998 Postdoctoral Fellow

University of California, San Diego

- 1998-1999 Postdoctoral Fellow

#### Professional appointments

Ansaldo Trasporti S.p.A., Napoli, Italy

- 1993 - 1994: IT Analyst

The Ohio State University, Columbus OH, USA

- 2000 - 2007: Assistant Professor, Dept of Computer Science and Engineering
- 2001 - 2009: Assistant Professor (adjunct), Dept of Biomedical Informatics

Telethon Institute of Genetics and Medicine (TIGEM), Naples, Italy

- 2007 - 2011: Visiting Scientist

Università di Napoli "Federico II"

- 2007 - 2009: Term Lecturer (Prof. a contratto), Facoltà di Scienze M.F.N.

The Microsoft Research – University of Trento Centre for Computational and Systems Biology (COSBI), Rovereto, Italy

- 2011 - present:            Researcher  
Università di Trento
- 2015 – 2016: Term Lecturer (Prof. a contratto), Dept of Mathematics
- 2016 – present:            Associate Professor, Dept of Mathematics

#### Awards

- 1994: Fulbright Scholarship
- 1997: NATO Advanced Science Fellowship
- 2006: Elevation to IEEE Senior Member
- 2012: 1st place in the M.S. sub-challenge / 2nd place Overall in the open international competition “IBM/PMI SBV IMPROVER Diagnostic Signature Challenge”

#### Research interests

Development of novel methods for the identification of diagnostic biomarkers based on -omics profiles. Investigation of systems biology approaches to integrative data analysis. Development of methods for the inference of gene regulation networks and their analysis. Investigation of biologically inspired approaches to self-organizing high-performance distributed computing.

#### Coordination/participation to Scientific Projects (2000-2018; selection)

- 2003: National Science Foundation (NSF), USA: “Iterative Hybrid Alignment: improving sensitivity of biological databases searches”; duration: 36 months – co-PI.
- 2004: San Diego Supercomputer Center (SDSC), USA: “Enabling Parallel I/O with the Remote Storage Server Middleware”; duration: 12 months – principal investigator.
- 2007: EU - FP6: “AnEUploidy: understanding the importance of gene dosage imbalance in human health using genetics, functional genomics and systems biology.”; duration: 48 months – member of the TIGEM team.
- 2015: Nestle Institute of Health Sciences (Lausanne, CH): “Identification of metabolic markers of pre-diabetes in childhood (Earlybird project)”, duration: 24 months – leader of the COSBI team.

#### Member of Scientific Societies

- 1997 – present: member of the Institute of Electrical and Electronics Engineers (IEEE)
- 2014 – present: member of Società Italiana di Biofisica e Biologia Molecolare (SIBBM)

#### Referee/Evaluator for peer-reviewed journals (selection)

IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Evolutionary Computation, IEEE Transactions on Networking, Concurrency and Computation: Practice and Experience, Computer Journal, Journal of Grid Computing, PlosONE, BMC Bioinformatics, BMC Systems Biology, BMC Med Genomics, BMC Genomics, Communications in Statistics.

Author of > 60 publications.

Total number of citations: 1105 (Scopus); 2446 (Google Scholar)

H index: 17 (Scopus); 22 (Google Scholar)

#### Symposia, Invited lectures, international schools

- 2008 - 5th International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB08), Oct 3-4 2008, Vietri sul Mare (SA). Invited talk. Title: "Reverse engineering of gene networks: Overview & applications"
- 2011 - Summer School in Molecular Biomedicine, PhD program of the University of Trieste and the University of Udine, Trieste, July 2011. Invited lecture. Title: "Systems biology approaches to elucidate gene regulation and drug discovery"
- 2011 - Institute for Systems Biology, Seattle, USA, May 2011. COSBI group visit. Title: "Network Inference and Analysis"
- 2012 - SBV IMPROVER Symposium, Boston, USA, October 2012. Invited talk as winner of MS sub-challenge and 2nd place winner of the international Diagnostic Biomarker algorithm competition. Title: "Rank-based Diagnostic Biomarkers"
- 2014 - European Biotech Week 2014, Museo delle Scienze di Trento (MUSE), Oct 6-12, 2014. Public seminar for high school students. Title: "Dal Genoma al Trascrittoma; come si analizza la macchina genetica"

#### Most recent scientific publications (2010-2021)

1. R. De Cegli, A. Romito, S. Iacobacci, L. Mao, M. Lauria, A. O. Fedele, J. Klose, C. Borel, P. Descombes, S. E. Antonarakis, D. di Bernardo, S. Banfi, A. Ballabio, G. Cobellis, "A mouse Embryonic Stem Cell Bank for inducible overexpression of human chromosome 21 genes.", *Genome Biology*, June 2010 22;11(6):R64.
2. Y. Li, N. Chia, M. Lauria, R. Bundschuh, "A performance enhanced PSI-BLAST based on Hybrid Alignment", *Bioinformatics*, 27, 1, pp. 31-37, 2011.
3. Niola F, Zhao X, Singh D, Castano A, Sullivan R, Lauria M, Nam HS, Zhuang Y, Benezra R, Di Bernardo D, Iavarone A, Lasorella A. "Id proteins synchronize stemness and anchorage to the niche of neural stem cells." *Nature Cell Biology*. 2012 Apr 22;14(5):477-87.
4. De Cegli R., Iacobacci S., Flore G., Mao L., Cutillo L., Gambardella G., Lauria M., Klose J., Illingworth E., Banfi S., di Bernardo D. "Reverse-engineering a stem-cell specific transcriptional network reveals a new modulator of neuronal differentiation", *Jan 2013, Nucleic acids research* 41 (2), 711-726.
5. Lauria M, "Rank-based transcriptional signatures: a novel approach to diagnostic biomarker definition and analysis", *Sept 2013, Systems Biomedicine* 1 (4), 35-46.
6. Caberlotto L, Lauria M, Nguyen TP, Scotti M, "The Central Role of AMP-Kinase and Energy Homeostasis Impairment in Alzheimer's Disease: A Multifactor Network Analysis", *Nov 2013, PloS One* 8 (11), e78919
7. Tarca AL, Lauria M, Unger M, Bilal E, Boue S, Dey KK, Hoeng J, Koepl H, et al. "Strengths and limitations of microarray-based phenotype prediction: Lessons learned from the IMPROVER Diagnostic Signature Challenge", *Nov 2013, Bioinformatics* 29 (22), 2892-2899
8. M Lauria, "Rank-based miRNA signatures for early cancer detection", *BioMed Research International*, 2014:192646.
9. L Caberlotto, M Lauria, "Systems biology meets -omic technologies: novel approaches to biomarker discovery and companion diagnostic development", *Expert review of molecular diagnostics*, 2015 Feb;15(2):255-65.
10. Lauria M, Moyseos P, Priami C. "SCUDO: a tool for signature-based clustering of expression profiles", *Nucleic Acids Research* 2015 Jul 1;43(W1):W188-92.
11. Jordán F, Lauria M, Scotti M, Nguyen TP, Praveen P, Morine M, Priami C. "Diversity of key players in the microbial ecosystems of the human body", *Scientific Reports*. 2015 Oct 30;5:15920.
12. Lacroix S, Lauria M, Scott-Boyer MP, Marchetti L, Priami C, Caberlotto L. "Systems biology approaches to study the molecular effects of caloric restriction and polyphenols on aging processes", *Genes & Nutrition*. 2015 Nov;10(6):58.
13. Allen GI, Amoroso N, Anghel C, Balagurusamy V, Bare CJ, Beaton D, Bellotti R, Bennett DA, Boehme KL, Boutros PC, Caberlotto L, Caloian C, Campbell F, Chaibub Neto E, Chang YC, Chen B, Chen CY, Chien

TY, Clark T, Das S, Davatzikos C, Deng J, Dillenberger D, Dobson RJ, Dong Q, Doshi J, Duma D, Errico R, Erus G, Everett E, Fardo DW, Friend SH, Fröhlich H, Gan J, St George-Hyslop P, Ghosh SS, Glaab E, Green RC, Guan Y, Hong MY, Huang C, Hwang J, Ibrahim J, Inglese P, Iyappan A, Jiang Q, Katsumata Y, Kauwe JS, Klein A, Kong D, Krause R, Lalonde E, Lauria M, Lee E, Lin X, Liu Z, Livingstone J, Logsdon BA, Lovestone S, Ma TW, Malhotra A, Mangravite LM, Maxwell TJ, Merrill E, Nagorski J, Namasivayam A, Narayan M, Naz M, Newhouse SJ, Norman TC, Nurtdinov RN, Oyang YJ, Pawitan Y, Peng S, Peters MA, Piccolo SR, Praveen P, Priami C, Sabelnykova VY, Senger P, Shen X, Simmons A, Sotiras A, Stolovitzky G, Tangaro S, Tateo A, Tung YA, Tustison NJ, Varol E, Vradenburg G, Weiner MW, Xiao G, Xie L, Xie Y, Xu J, Yang H, Zhan X, Zhou Y, Zhu F, Zhu H, Zhu S; Alzheimer's Disease Neuroimaging Initiative. "Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease", *Alzheimer's & Dementia* 2016 Jun;12(6):645-53.

14. Nassiri I, Lombardo R, Lauria M, Morine MJ, Moyses P, Varma V, Nolen GT, Knox B, Sloper D, Kaput J, Priami C. "Systems view of adipogenesis via novel omics-driven and tissue-specific activity scoring of network functional modules", *Scientific Reports*. 2016 Jul 7;6:28851.

15. Caberlotto L, Marchetti L, Lauria M, Scotti M, Parolo S. "Integration of transcriptomic and genomic data suggests candidate mechanisms for APOE4-mediated pathogenic action in Alzheimer's disease", *Scientific Reports*. 2016 Sept 2;6:32583.

16. Allen, Genevera I, et al., "Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease" in *Alzheimer's & Dementia*, v. 12, n. 6 (2016), p. 645-653.

17. Marchetti L., Siena E., Lauria M., Maffioni D., Pacchiani N., Priami C., Medini D., "Exploring the Limitations of Peripheral Blood Transcriptional Biomarkers in Predicting Influenza Vaccine Responsiveness", *Complexity*, v. 2017, (2017), p. 1-9

18. M Gönen et al., "A Community Challenge for Inferring Genetic Predictors of Gene Essentialities through Analysis of a Functional Screen of Cancer Cell Lines", *Cell Systems* 5 (5), 485-497. e3

19. Lauria M, Persico M, Dordevic N, Cominetti O, Matone A, Hosking J, Jeffery A, Pinkney J, Da Silva L, Priami C, Montoliu I, Martin FP., "Consensus Clustering of temporal profiles for the identification of metabolic markers of pre-diabetes in childhood (EarlyBird 73)", *Scientific Reports*, 2018 Jan 23;8(1):1393.

20. Parolo S, Marchetti L, Lauria M, Misselbeck K, Scott-Boyer MP, Caberlotto L, Priami C., "Combined use of protein biomarkers and network analysis unveils deregulated regulatory circuits in Duchenne muscular dystrophy.", *PLoS One*, 2018 Mar 12;13(3):e0194225

21. L Carboni, L Marchetti, M Lauria, P Gass, B Vollmayr, A Redfern, L Jones, et al. "Cross-species evidence from human and rat brain transcriptome for growth factor signaling pathway dysregulation in major depression", *Neuropsychopharmacology* 43 (10), 2018, 2134-2145

22. L Caberlotto, T Nguyen, M Lauria, C Priami, R Rimondini, S Maioli, et al. "Cross-disease analysis of Alzheimer's disease and type-2 Diabetes highlights the role of autophagy in the pathophysiology of two highly comorbid diseases", *Scientific reports*, 2019 9 (1), 1-13

23. L Marchetti, M Lauria, L Caberlotto, L Musazzi, M Popoli, AA Mathé, et al. "Gene expression signature of antidepressant treatment response/non-response in Flinders Sensitive Line rats subjected to maternal separation", *European Neuropsychopharmacology* 31, 2020, 69-85.

24. M Ciciani, T Cantore, M Lauria, "rScudo: an R package for classification of molecular profiles using rank-based signatures", *Bioinformatics* 36 (13), 2020, 4095-4096
25. L Carboni, F Pischedda, G Piccoli, M Lauria, L Musazzi, M Popoli, et al. "Depression-associated gene *Negr1-Fgfr2* pathway is altered by antidepressant treatment", *Cells* 9 (8), 2020, 1818
26. C Taslim, TT Allen, M Lauria, SH Tseng, "Design of experiments for steady-state system identification with applications in genetic and business network modeling",  
*Journal of Industrial and Production Engineering* 37 (6), 2020, 259-274
27. G Fiorentino, R Visintainer, E Domenici, M Lauria, L Marchetti, "MOUSSE: Multi-Omics Using Subject-Specific SignaturEs", *Cancers* 13 (14), 2021, 3423