

Susana Vinga

Associate Professor

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Present and Past Positions

2018- Associate Professor, IST/ULisboa
2013-18 Principal Investigator at CSI, IDMEC
2013-18 Invited Assistant Professor, Instituto Superior Técnico, Universidade Lisboa (IST-UL)
2006-13 Senior Researcher, KDBIO group, INESC-ID
2005-13 Invited Assistant Professor, Dept. Biostatistics and Informatics, FCM-UNL

Education

2005 PhD (Doutoramento) Biology (Bioinformatics), Instituto de Tecnologia Química e Biológica, Universidade Nova de Lisboa (ITQB/UNL)
2002 Post-graduation (Pós-graduação) Applied Mathematics: Probability and Statistics (IST)
1999 BSc (5-year Licenciatura), Mechanical Engineering: Automation and Robotics (IST); Biomedical Engineering Courses (Politecnico di Milano)

Projects

Principal investigator

PERSEIDS - Personalizing cancer therapy through integrated modeling and decision (PTDC/EMS-SIS/0642/2014, Vinga S, PI). Funding (FCT): 199,997€. IDMEC: 69,019€. 17 Jun 2016 – 16 Jun 2019.
CancerSys – Multiscale modeling for personalized therapy of bone metastasis. FCT (EXPL/EMS-SIS/1954/2013). From 01-04-2014 to 31-03-2015. Funding: 49,997€
HIVCONTROL - Control based on dynamic modeling of HIV-1 infection for therapy design. FCT (PTDC/EEACRO/100128/2008). From Jan-2010 to Dec-2012. Funding: 144,474€.
DynaMo – Dynamic modeling, control and optimization of metabolic networks. FCT (PTDC/EEA-ACR/69530/2006). From Sep-2007 to Aug-2010. Funding: 190,000€.

Workpackage/Task Leader/Member of Team

SOUND - Statistical multi-Omics UNDERstanding of Patient Samples. Financed by: H2020-PHC-2014-two-stage, PHC-32-2014 (RIA). Prime contractor: EMBL (Wolfgang Huber, PI). Contract No. 633974. Funding: 2,953,063€, IDMEC: 315,929€. 1 Sep 2015 – 31 Aug 2018.
InteleGen – Pharmacokinetic/Pharmacogenetic modulation of HIV infection therapy by Bayesian and artificial intelligence methods. FCT (PTDC/DTP-FTO/1747/2012). From 1-Jun-2013 a 31-May-2015. Funding: 140,000€. Task Leader.
BachBerry - BACterial Hosts for production of Bioactive phenolics from bERRY fruits. Financed by: FP7. KBBE.2013.3.1-01: Plant High Value Products – from discovery to final Product. Prime contractor: Danmarks Tekniske Universitet DTU (Jochen Förster, PI). FP7- 613793. Beg. 1 Oct 2013. Funding: 7,150,123€. Workpackage Leader.
PneumoSys - A systems biology approach to the role of pneumococcal carbon metabolism in colonization and invasive disease. FCT (PTDC/SAU-MII/100964/2008). From 1-Jan-2010 to 31-Dec-2012. Funding: 199,650€. Task Leader.
PNEUMOPATH - A comprehensive dissection of pneumococcal-host interactions. Prime contractor: University of Leicester (Peter Andrew, PI). Financed by: EU-FP7 (Contract 222983). From Mar-2010 to Feb-2012. Funding: 2,999,843€.

Research Interests

Bioinformatics, Computational Biology, Systems Biomedicine. Probability and Statistics. Biomedical Engineering. Applied Mathematics to Biological Sciences and Medicine.

Supervision and other activities

(Co-)supervisions: 6 post-doc, 6 PhD (4 defended), 28 MSc Theses, several internships and grant holders.
Associate Editor of BMC Bioinformatics. Reviewer (more than 12 international journal) and 5 participations in scientific program committees.

Grants and awards

- 2017 Scientific Prize of the University of Lisbon/Caixa Geral de Depósitos in the area of Computer Science and Engineering.
- 2012 Winner Principal Investigator position (Development Grant) under the highly competitive Investigador FCT program.
- 2010 Young Researcher Award of the Technical University of Lisbon (UTL) in the area of Informatics for the impact of her publications.
- 1989 Winner of the VII National Mathematical Olympiads, Portuguese Mathematical Society

Selected publications

- Lopes, M. B., Verissimo, A., Carrasquinha, E., Casimiro, S., Beerenwinkel, N., & Vinga, S. (2018). Ensemble outlier detection and gene selection in triple-negative breast cancer data. *BMC Bioinformatics*, 19. doi: 10.1186/s12859-018-2149-7
- Zielezinski, A., Vinga, S., Almeida, J., & Karlowski, W. M. (2017). Alignment-free sequence comparison: benefits, applications, and tools. *Genome Biology*, 18. doi: 10.1186/s13059-017-1319-7
- Hartmann, A., Vila-Santa, A., Kallscheuer, N., Vogt, M., Sagot, M.-F., Marienhagen, J., & Vinga, S. (2017). OptPipe - a Pipeline for Optimizing Metabolic Engineering Targets. *BMC Systems Biology*, 11. doi: 10.1186/s12918-017-0515-0
- Julien-Laferriere, A., Bulteau, L., Parrot, D., Marchetti-Spaccamela, A., Stougie, L., Vinga, S., Mary, A. & Sagot, M. F. (2016). A Combinatorial Algorithm for Microbial Consortia Synthetic Design. *Scientific Reports*, 6, 12. doi: 10.1038/srep29182
- Verissimo, A., Oliveira, A. L., Sagot, M. F., & Vinga, S. (2016). DegreeCox - a network-based regularization method for survival analysis. *BMC Bioinformatics*, 17. doi: 449 10.1186/S12859-016-1310-4
- Vinga S (2014) Information theory applications for biological sequence analysis. *Brief Bioinform* (2014) 15 (3): 376-389. doi: 10.1093/bib/bbt068
- Caldas J, Vinga S (2014) Global Meta-Analysis of Transcriptomics Studies. *PLoS ONE* 9(2): e89318. doi:10.1371/journal.pone.0089318
- Costa RS, Hartmann A, Gaspar P, Neves AR, Vinga S (2014) An extended dynamic model of *Lactococcus lactis* metabolism for mannitol and 2,3-butanediol production. *Molecular BioSystems*. DOI: 10.1039/C3MB70265K
- Verissimo A, Paixão L, Neves AR, Vinga S (2013) BGFit: management and automated fitting of biological growth curves. *BMC Bioinformatics* 14(1), art. no. 283. DOI: 10.1186/1471-2105-14-283
- Gaspar P, Carvalho AL, Vinga S, Santos H, Neves AR. (2013) From physiology to systems metabolic engineering for the production of biochemicals by lactic acid bacteria. *Biotechnology Advances* 2013, 31(6):764-788. <http://dx.doi.org/10.1016/j.biotechadv.2013.03.011>
- Vinga S, Carvalho AM, Francisco AP, Russo LMS, Almeida JS. (2012) Pattern matching through Chaos Game Representation: bridging numerical and discrete data structures for biological sequence analysis. *Algorithm Mol Biol* 2012, 7:10.
- Tenazinha N, and Vinga S (2011) A Survey on Methods for Modeling and Analyzing Integrated Biological Networks, *IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)*. Vol. 8, no. 4, pp. 943-955, July/August 2011.
- Vinga S, Neves AR, Santos H, Brandt BW, and Kooijman SALM (2010) Subcellular metabolic organization in the context of Dynamic Energy Budget and Biochemical Systems theories. *Philosophical Transactions of the Royal Society B*. 2010 Nov 12; 365(1557):3429-42.
- Vilela M, Vinga S, Maia MA, Voit EO, Almeida JS (2009) Identification of neutral biochemical network models from time series data, *BMC Systems Biology*, 3(47), May. 2009.
- Vinga, S., and Almeida, J. S. (2007). Local Renyi entropic profiles of DNA sequences. *BMC Bioinformatics*, 8, 393.
- Vinga, S., and Almeida, J. S. (2004). Renyi continuous entropy of DNA sequences. *Journal of Theoretical Biology*, 231(3), 377-388.
- Vinga, S., and Almeida, J. (2003). Alignment-free sequence comparison - a review. *Bioinformatics*, 19(4), 513-523.