

Irina I. Mohorianu

Head of Bioinformatics/ Scientific Computing

Wellcome-MRC Stem Cell Institute,
University of Cambridge

Turing Fellow in Machine Learning and Bioinformatics,
Turing Institute, London

Email:
iim22@cam.ac.uk

Senior College Research Associate in Computer Science

Clare College, Cambridge

Education

2008-2012 Ph.D., School of Computing Sciences, University of East Anglia, Norwich, United Kingdom.

Thesis : **Discovering the regulatory mechanisms of small RNAs in plants**

Supervisors : Prof. Vincent Moulton, Prof. Tamas Dalmay

2004-2008 BSc with honours (top 1%, averaged marks across study years 9.85/10),

Faculty of Computer Science, University "Al. I. Cuza", Iasi, Romania.

Thesis : **Classic and Modern approach on Linear Optimization**

Supervisors: dr. Anca Ignat, dr. Liviu Ciortuz; Grade: 10/10

Research Positions

02/2019-present **Head of Bioinformatics/ Scientific Computing**

Wellcome-MRC Cambridge Stem Cell Institute, University of Cambridge

I am leading a group of 8 people (3 Research Assistants, and 5 interns); we are responsible with the efficient and timely completion of routine analyses and with the development of new methods for the analysis of datasets

Co-investigator on "**The effect of age and gender on the transcriptomic signatures of mesenchymal stem-cells - optimisation for cell-based cartilage therapy**" (PI: W Khan, £93k)

10/2021-present **Turing Fellow in Machine Learning and Bioinformatics**; member of the Academic Programmes Skills subgroup and part of the Health and Medical Sciences Programme community.

10/2017-01/2019 **Bioinformatics Lead** at the Oxford Vaccine Group

Department of Medical Sciences, University of Oxford

02/2012-10/2017 **Senior Bioinformatics Research Associate**

School of Computing Sciences and Biological Sciences, University of East Anglia, Norwich, UK.

BB/L003139/1 **Functional significance and regulation of the reproductive 'transferome'**

BB/H002499/1 **How males respond to rivals: an integrated study of molecular mechanisms and fitness consequences**

I was also a contributor to the **UEA sRNA Workbench**, BBSRC grants BB/I00016X/1 and BB/L021269/1.

12/2006-09/2008 **Research Assistant** Institute of Theoretical Computer Science, Iasi, Romania

Teaching

10/2021 - Module Leader for '**Introduction to Machine Learning**' and '**Applied Machine Learning to Bioinformatics**' for the Health Data Science branch of a new Master program in Population Health Sciences.

10/2019 - Lecturer for the '**Introduction to Machine Learning**' course organised by the Bioinformatics Training Facility

10/2020 - **Lecturer in bioinformatics for BBS**, School of Biological Sciences, University of Cambridge

10/2020 - **Senior College Research Associate in Computer Science**, Clare College, Cambridge, UK

Tutor in **Information Theory, Data Science, Machine Learning on Real-world Data, Introduction to Probabilities**

01/2018 - **College Lecturer in Computer Science**, University College Oxford, UK

Tutor in '**Imperative programming (Scala)**', '**Continuous Maths**' and '**Linear Algebra**' (1st year). Tutor in '**Algorithms and Data Structures**' (2nd year), '**Machine Learning**', and '**Computational Complexity**' (3rd year).

Peer-reviewed publications [selection]

H-index: 19; I10-index: 29

* indicates joint first authors; @ indicates joint corresponding author

The names of students and post-docs whom I supervised are underlined.

M- indicates method development papers, DA- indicates data analysis papers

- Method papers
1. A Shahsavari, A Munteanu, **I Mohorianu**, 'ClustAssess: tools for assessing the robustness of single-cell clustering', under review in *Nucleic Acids Research*
 2. EC Williams, K Ridley, T Bartels, DH Rowitch, **I Mohorianu**, 'GridProCo: a **grid**-based method for assessing mRNA and **protein** correlations in expression levels at spatial resolution'
 3. I Moutsopoulos, EC Williams, **I Mohorianu**, 'bulkAnalyseR: An accessible, interactive pipeline for analysing and sharing bulk sequencing results', <https://www.biorxiv.org/content/10.1101/2021.12.23.473982v1>, in revision in *Briefings in Bioinformatics*
 4. E Williams, R Chazarra-Gil, A Shahsavari, **I Mohorianu**[@], 'The sum of two halves might not be the whole. Effects of splitting samples across lanes', <https://www.biorxiv.org/content/10.1101/2021.05.10.443429v2>, under revision in *Gene*
 5. I Moutsopoulos, L Maischak, E Lauzikaite, S Vasquez, E Williams, HG Drost, **I Mohorianu**[@], 'Identification of technical noise in sequencing datasets. Effects of noise on the biological interpretation of results.', *Nucleic Acids Research*, Volume 49, Issue 14, 20 August 2021, Page e83, <https://doi.org/10.1093/nar/gkab433>
 6. E Williams, A Calinescu, **I Mohorianu**[@], 'feamiR: Feature selection based on Genetic Algorithms for predicting miRNA-mRNA interactions', submitted to *Nucleic Acids Research*
- Data Analysis papers
1. C Britto*, **I Mohorianu***, ..., KL Moffitt, "Host respiratory transcriptome signature associated with poor outcome in children with influenza-Staphylococcus aureus pneumonia", *The Journal of Infectious Diseases*, jiac325, <https://doi.org/10.1093/infdis/jiac325>
 2. C Gribben*, V Galanakis*, A Calderwood, R Chazarra Gil, ..., **I Mohorianu**[@] and L Vallier[@], "Acquisition of epithelial plasticity in the human liver during chronic disease progression.", submitted to *Nature*
 3. M Colzani, J Bargehr, F Mescia, E Williams, V Knight-Schrijver, J Lee, Cambridge Institute of Therapeutic Immunology and Infectious Disease - National Institute of Health Research (CITIID-NIHR) COVID BioResource Collaboration, C Summers, **I Mohorianu**, KGC Smith, PA Lyons, S Sinha, "Proinflammatory cytokines in serum driving cardiotoxicity in Covid19", in revision in *European Heart Journal*
 4. S Haston. E Gonzalez-Gualda, S Morsli, V Reen, A Calderwood, I Moutsopoulos,..., M Signore, **I Mohorianu**, J Gil[@], D Munoz-Espín[@], JP Martinez-Barbera[@], "Clearance of senescent macrophages ameliorates tumorigenesis in KRAS-driven lung cancer", in revision in *Cancer Cell*
 5. Y Costa, L Bates, E Lauzikaite, ..., B Payer, **I Mohorianu**[@], JCR Silva. "Nanog mediates erasure of imprint associated epigenetic marks via Prdm14 in embryonic stem cells.", in revision in *Nature Communications*.
 6. M T. Bejar, P Jimenez-Gomez, I Moutsopoulos, ..., B Gottgens, **I Mohorianu**, B D. Simons, M P. Alcolea, "Defining the transcriptional signature of esophageal-to-skin lineage conversion", <https://www.biorxiv.org/content/10.1101/> in revision in *Cell Stem Cell*
 7. H Bulstrode, GC Girdler, T Gracia, A Aivazidis, I Moutsopoulos, ..., **I Mohorianu**, A Barker, TR Sweeney, O Bayraktar, F Gergely, DH Rowitch, 'The microglial secretome regulates flavivirus infection of developing and malignant human neural stem cells', accepted in *Neuron*
 8. M Mangolini, A Maiques-Diaz, ..., **I Mohorianu**, C D'Santos, S Deaglio, J I. Martin-Subero, I Ringshausen, "NOTCH1 drives immune-escape mechanisms in B cell malignancies", doi: <https://doi.org/10.1101/2021.04.10.439192>, accepted in *Nature Communications*
 9. M Lawrence, A Shahsavari, Susanne Bornelov, ..., **Irina Mohorianu**[@], C Ghevaert, "Mapping the biogenesis of forward programmed megakaryocytes from induced pluripotent stem cells", accepted in *Science Advances*
 10. J Chen, V Sathiaselan, A Moore, S Tan, C Sekkar Reddy Chilamakuri, V Nila Roamio Franklin, A Shahsavari, C Jakwerth, S B. Hake, A J. Warren, **I Mohorianu**, C D'Santos, I Ringshausen, "ZAP-70 constitutively regulates gene expression and protein synthesis in chronic lymphocytic leukemia", *Blood*. 2021 Feb 22;blood.202009960. doi: 10.1182/blood.202009960.
 11. AM Ranzoni, ..., **I Mohorianu**, JB Zaugg, A Cvejic, 'Integrative Single-cell RNA-Seq and ATAC-Seq Analysis of Human Foetal Liver and Bone Marrow Haematopoiesis', *Cell Stem Cell* 28 (3), 472-487. e7
 12. DL Cross,..., **I Mohorianu**, ..., A Pollard, 'Vi-vaccinations induce heterogeneous plasma cell responses that associate with protection from typhoid fever', *Frontiers in immunology* 11, 3020

Supervision of students

[MSc] **Eleanor Williams**, University College, Oxford (2020); she won the G-prize for the best dissertation in Mathematics and Computer Science; the topic was on adapting a feature selection method for enhancing the accuracy of prediction for microRNA/mRNA interactions in animal systems; co-supervised with Prof Ani Calinescu

[MSc] **Andi Munteanu**, University Cuza, Iasi, Romania (2022); the dissertation was evaluated as excellent (10/10); the topic was on improving the assessment of clustering in single cell expression data; co-supervised with Prof Liviu Ciortuz

[PhD] **Ilias Moutsopoulos**, Cambridge Stem Cell Institute (2021-); the topic is on inference and characterisation of Gene Regulatory Networks; co-supervised with Dr Daniel Hodson

[PhD] **Eleanor Williams**, Cambridge Stem Cell Institute (2022-); the topic is on creating novel methods for spatial transcriptomics assays; co-supervised with Prof Ludovic Vallier

Last updated: November 4, 2022