ALESSANDRO BARBERIS

Nuffield Department of Surgical Sciences, University of Oxford
Old Road Campus Research Building, Roosevelt Drive, Oxford, OX3 7DQ
Mobile: 07510471232 Email: alessandro.barberis@nds.ox.ac.uk

HIGHER EDUCATION

2014 **PhD in Electronics, Computer Science and Electrical Engineering,**
Department of Engineering, University of Pavia (Italy)
Thesis: High-performance computing for highly demanding applications

2010 **MSc in Automation Engineering (110/110 *cum laude*, highest grade in Italy),**
Department of Engineering, University of Pavia (Italy)
Thesis: Identification of an order parameter in Monte Carlo simulations of dipolar systems on hexagonal lattices

2007 **BSc in Computer Science Engineering,**
Department of Engineering, University of Pavia (Italy)
Thesis: Automated fingerprint recognition: software for data handling and validation

RESEARCH EXPERIENCE

2022 - now **Senior Researcher, Nuffield Department of Surgical Sciences, University of Oxford**
IGF laboratory

- Studying the contribution of insulin-like growth factors (IGFs) to prostate cancer biology
- Implementing portable and reproducible computational pipelines (**Nextflow**, **bash**, **R**)
- Performing bioinformatics analysis to support different research projects

2014 - now **Post-doctoral Researcher, Department of Oncology, University of Oxford**
Computational Biology and Integrative Genomics (CBIG) group

- Studying the relationship between obesity and gene expression in cancer via artificial intelligence (AI) techniques
- Developed software to extract genomic data from large public repositories (**R**)
- Implemented novel computational pipelines to analyse microarray and next-generation sequencing data (**R**)
- Created software for robust and reproducible biomedical analysis via AI (**R**)
- Identified machine learning model of response to radiation in rectal cancer (**R**)
- Designed and implemented frontend/backend of web-based platform for biomarker discovery (**R, HTML5, CSS, Java, JavaScript, jQuery, Spring Framework**)
- Contributed to design and implementation of database for storing health data (**MySQL**)
- Contributed to creation of software for quality control of gene signatures by writing code and reviewing code developed by collaborators (**R**)

- Published in top-tier peer-reviewed journals
- Supported grant applications
- Collaborated with different research groups

2010 - 2013 PhD Research
Custom Computing and Programmable Systems laboratory, University of Pavia

- Gained experience in data processing and high-performance computing using multicore processors, graphics processing units (GPUs), field programmable gate arrays (FPGAs), clusters
- Utilised GPUs and FPGAs technologies to develop real time solutions for image analysis
- Modified popular imaging algorithm to lower computational complexity and developed first-ever parallel solution using different programming languages (**C/C++**, **OpenCL**, **VHDL**, **MATLAB**) and libraries (**BLAS**, **CUDA**, **cuBLAS**, **OpenMP**, **MPI**)
- Created parallel implementation of Monte Carlo simulations code (**C**, **OpenMP**, **MPI**)
- Collaborated with the Hyperspectral Computing Laboratory (University of Extremadura, Spain) and the Laboratory of Complex Fluids and Molecular Biophysics (University of Milan, Italy)

Extra-curricular activities
- Attended extra courses (e.g. in Histology, Physiology, Biology) held either at the University of Pavia and online (e.g. MITx)

PRIZES AND AWARDS

2013 4th position over 40 proposals in the national Altera Design Contest Innovate Italy
2010 Awarded 1 of 6 fully funded PhD scholarships by the University of Pavia for the PhD course in Electronics, Computer Science and Electrical Engineering (~ €45000)

PATENT PENDING

Medical e-Research Linking genomic with clinical data: Merlin, a web-based platform for biomarkers discovery

INVITED TALK

2018 Invited talk on “Big data in genomics: towards personalised medicine”, Technical University of Madrid

TEACHING EXPERIENCE

INTERNATIONAL COURSES
2018 - 2019 *Assistant* at the Wellcome Genome Campus Advanced Course: RNA transcriptomics (Cambridge)
2011 *Lecturer* for the Summer School on Data Fusion and High-Performance Computing onboard aircraft (University of Pavia, Italy)

UNIVERSITY OF OXFORD

2020 - 2021 *Lecturer* in Bioinformatics and *Internal Assessor* for MSc in Precision Cancer Medicine
2020 - 2021 *Lecturer* in Statistics and *Assistant* for MSc in Radiation Biology
2014 - now Delivering *research co-supervision* at MSc and PhD level, training junior lab members in statistics and bioinformatics
2016 Delivered *research co-supervision* within the S-CORT consortium

UNIVERSITY OF PAVIA

2010 - 2013 Delivered *research co-supervision* at MSc level

PUBLICATIONS

JOURNAL ARTICLES, PEER REVIEWED

Kawashima, M., Bensaad, K., Zois, C., **Barberis, A.**, Bridges, E., Lagerholm, C., Dmitriev, R. I., Toi, M., Papkovsky, D. B., Buffa, F. M., Harris, A. L., *Disruption of hypoxia-inducible fatty acid binding protein 7 induces beige fat-like differentiation and thermogenesis in breast cancer cells.* Cancer & Metabolism (2020)

Dhawan, A., **Barberis, A.**, Cheng, W.-C., Domingo, E., West, C., Maughan, T., Scott, J. G., Harris, A. L., Buffa, F. M., *Guidelines for using sigQC for systematic evaluation of gene signatures*. Nature Protocols 14, 1377–1400 (2019)

Chen, L., Zeng, X., Kleibeuker, E., Buffa, F. M., **Barberis, A.**, Leek, R. D., Roxanis, I., Zhang, W., Worth, A., Beech, J. S., Harris, A. L., Cai, S., *Paracrine effect of GTP cyclohydrolase and angiopoietin-1 interaction in stromal fibroblasts on tumor Tie2 activation and breast cancer growth*. Oncotarget 7, 9353–9367 (2016)

Raducu, M., Fung, E., Serres, S., Infante, P., **Barberis, A.**, Fischer, R., Bristow, C., Thézénas, M. L., Finta, C., Christianson, J.C., Buffa, F. M., Kessler, B. M., Sibson, N. R., Di Marcotullio, L., Toftgård, R., D'Angiolella, V., *SCF (Fbxl17) ubiquitylation of Sufu regulates Hedgehog signaling and medulloblastoma development*. EMBO J. 35,1400–1416 (2016)

Barberis, A., Harris, B. H. L., West, C. M. L., Buffa, F. M., *Gene expression signatures as biomarkers of tumour hypoxia*. Clinical Oncology, 27, 547–560 (2015)

Barberis, A., Danese, G., Leporati, F., Plaza, A., Torti, E., *Real-Time Implementation of the Vertex Component Analysis Algorithm on GPUs*. IEEE Geosci. Remote Sens. Lett. 10, 251–255 (2013)

CONFERENCE PROCEEDINGS

Lim, S. H.-S., Ip, E., Chua, W., Ng, W., Henderson, C., Shin, J.-S., Harris, B. H. L., **Barberis, A.**, Cowley, M., De Souza, P.L., Spring, K., *Serum microRNA expression during neoadjuvant chemoradiation for rectal cancer*. J. Clin. Oncol. 35, e15081–e15081 (2017)

Barberis, A., Leporati, F., *QR Decomposition via Householder Reflectors on FPGA Technology.* DSD & SEAA Euromicro Conference, Santander, Spain, 4-6 Sept. (2013)

PROFFERED COMMUNICATIONS

Barberis, A., Alonso-Calvo, R., Blake, A., Buffa, F. M., *Merlin: a web-based platform to derive robust gene signatures and evaluate existing patient classifiers*. Poster presented at:

CRUK/MRC Oxford Institute for Radiation Oncology Symposium; Saïd Business School, Oxford; 7-8 September (2017)

Domingo, E., Blake, A., Richman, S., Stewart, P., **Barberis, A.**, Haider, S., Cheng, W.-C., Dunne, P., Buffa, F. M., Gollins, S., Maughan, T., *Multi-omic profiling and radiotherapy response in rectal cancer biopsies of COPERNICUS trial: results from SCORT (Stratification in COloRecTal cancer).* Poster presented at: 15th International Wolfsberg Meeting on Molecular Radiation Biology/Oncology; Wolfsberg Castle, Ermatingen, Lake Constance, Switzerland; 17-19 June (2017)

UNDER REVIEW

Domingo, E., Rathee, S., Blake, A., … **Barberis, A.**, … Buffa, F.M., Maughan, T., S:CORT, *A machine learning model of complete response to radiation in rectal cancer reveals immune infiltrate and TGFβ signalling as key predictors.* Lancet Digital Health

Triantafyllidis, C. P., **Barberis, A.**, Cuervo, A. M., Charlton, P., Hartley, F., Van Bijsterveldt, L., Gjerga, E., Rodriguez, J. S., Buffa, F. M., *Reconstructing the functional effect of TP53 somatic mutations on its regulon using causal gene network modelling.* iScience

Javaid, H., **Barberis, A.**, Chervova, O., Voloshin, V., Buffa, F. M., and Humphrey, T., *SETD2 mutation and downregulation is associated with DNA methylation changes in a pan-cancer analysis*. BMC Cancer

Pasqualetti, F., **Barberis, A.**, …, Buffa, F. M., *The impact of survivorship bias in GBM research*. British Journal of Cancer

ADMINISTRATIVE EXPERIENCE

- Given responsibility to join interview panel for Oncology IT Manager (University of Oxford)
- Organised weekly CBIG group meeting (University of Oxford)
- Managed the purchases for CBIG group (University of Oxford)
- Oxford University Italian Society 2017-2021 committee member
- New College Boat Club 2015-2017 committee member (IT Secretary)
- Invigilating examinations (University of Pavia)
- Talking to students, teachers and parents at Open Days

RELEVANT SKILLS

- Effective communicator able to engage specialist and non-expert audiences
- Excellent team player experienced in working in groups with different backgrounds
- Confident, independent scientist with experience in conducting his own research
- Creative problem solver with track record in implementing innovative scientific solutions
- Trustful scientist who constantly meets deadlines
- Experienced in the development of novel data analysis methods
- Experienced in several programming languages (e.g., **R**, **Java**, **SQL**, **C**)
- Confident in web-based design using **html**, **css**, **php**, **javascript**, **jquery**