

Institutional webpage:

<https://cs.unibocconi.eu/people/francesca-buffa>

<https://www.oncology.ox.ac.uk/team/francesca-buffa>

<https://www.ifom.eu/en/cancer-research/research-labs/research-lab-buffa.php>

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I am Full Professor of Computing Sciences at Bocconi University and Senior Group Leader at IFOM (the FIRC Institute of Molecular Oncology) in Milan, Italy. I also hold a National Scientific Qualification as Full Professor in Molecular Biology/Bioinformatics by the Italian Ministry of University and Research (Professore Fascia I, SC 05/E2, MUR). Prior to these, I held a Full Professorship in Computational Biology at the University of Oxford, where I continue to serve in an honorary capacity. During my tenure at Oxford, I founded and led the Computational Biology and Integrative Genomics Laboratory, established in 2013 and sustained by a Cancer Research UK Programme Grant and, subsequently, a European Research Council Consolidator Award. My research lies at the intersection of artificial intelligence and multi-omics, with the aim of elucidating the molecular underpinnings of complex disease and translating these insights into actionable clinical and biomedical applications. A central focus is deciphering the role of the hypoxic tumour microenvironment in driving cancer evolution, heterogeneity, and therapeutic resistance.

1. Career and Education

Academic Appointments and Research Leadership (current)

Since 2023	Head of the AI and Systems Biology Lab, IFOM, Milan, Italy
Since 2022	Full Professor of Computing Sciences, Bocconi University, Milano, Italy
Since 2022	Honorary Researcher Professor Emeritus, University of Oxford, UK

Major Commission of Trust (selected, continued in Section 6)

Since 2020	Scientific Advisory Board Member, iCAN Digital Precision Cancer Medicine Flagship, Finland
2023	Panel member, Selections for Head of the National Facility for Data Handling and Analysis, Italy
2021-2022	Panel Member, Research Council of Norway, Norway
2020-2022	NIHR Urgent Public Health Group COVID-19 Prioritization Panel
2017-2022	Member of the UK Research Excellence Framework 2021 (REF2021), Biological Science A5 and Interdisciplinary Research Panels (https://www.ref.ac.uk/panels/panel-membership/)
2010-2021	Recurrent member of CRUK, MRC and Breast Cancer Now expert panels
2010-2016	Member of Horizon2020 EU Grant Panels (1-2 panels per year)

Previous Academic Appointments and Research Leadership

2013-2025	Head of the Computational Biology and Integrative Genomics Lab, University of Oxford, UK
2018-2024	Visiting Professor, MSc/PhD Life Science Innovation Program, University of Tsukuba (Japan)
2015-2022	Academic Lead for Bioinformatics, Medical Sciences Division, University of Oxford
2015-2019	Associate Professor, Computational Biology and Integrative Genomics, Medical Sciences Division
2014-2015	Lecturer, Department of Oncology, Medical Sciences, University of Oxford
2013	Functional Genomics Lead, OIRO, Department of Oncology
2010-2013	Senior Research Fellow, Weatherall Institute of Molecular Medicine (WIMM)
2009-2013	Visiting Research Fellow, Wellcome Trust Centre for Human Genetics
2006-2010	Senior Post-doctoral Researcher (Merit Award), Computational Biology, WIMM, University of Oxford
2005-2008	Visiting Statistician, Medical Research Council (MRC), London, UK
2003-2006	Post-doctoral Researcher, Gray Cancer Institute, London, UK
2001-2003	Post-doctoral Researcher, Institute of Cancer Research (ICR), London, UK

Major Grant Awards as Principal Investigator (selected, continued in Section 2)

2018-2024	European Research Council Consolidator Award microC 772970
2016-2023	Cancer Research UK Programme 23969
2013-2016	Cancer Research UK Career Development Award

Other Awards

Bocconi Impact Award 2024 for AI applications in health

Education and prizes in education

2001	PhD, Institute of Cancer Research (ICR), University of London, UK. PhD Prize.
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- 2000 1st Prize PhD Project Presentations. "Mathematical modelling of radiation response in hypoxic conditions" (Abstract published in: Med Phys 29259)
- 2000 EDRO Fellowship to attend the 1st Workshop on Biology in Radiation Oncology, Arhus, NL
- 1997-2001 PhD Fellowship, ICR, University of London, UK
- 1996-1997 Research Fellowship, Physics, Oncology Institute of Southern Switzerland
- 1992-1996 Theoretical Physics 4-year BSc. First-class Honours. University of Turin, Turin, Italy. Research Project Thesis: "Gauge invariant treatment for decay rate effects in quantum field theory"

2. Advanced study and research

Major Grant Awards as Principal Investigator

- 2018-2024 European Research Council ERC-2017-COG Programme Award, microC772970, 'Agent-Based Modelling of Gene Networks to model clonal selection in the tumour microenvironment and predict therapeutic resistance'. ~£2M
- 2016-2022 Cancer Research UK Programme Award 'Computational Biology and Integrative Genomics of the Tumour Microenvironment'. ~£1.8M
- 2013-2016 Career Development Award, CR-UK/MRC Oxford Institute. ~£0.8M

Major Grants as Co-Principal Investigator

- 2011-2015 EU Framework Programme 7 Network EURECA [ANRVYG0], ~£0.4M
- 2010-2015 EU Framework Programme 7 Network p-Medicine [ANRTOS0], ~£0.5M

Other Major Grants as Co-Investigator

- 2015-2018 Prostate Cancer UK [PG14 008 TR2] 'Development and validation of a hypoxia gene signature as a biomarker of radioresistance in prostate cancer' ~£0.4M
- 2014-2019 Cancer Research UK Science Committee [C1094/A17977] NIMRAD-METAGENE 'Prospective qualification of a hypoxia metagene biomarker' ~£0.3M
- 2011-2013 Cancer Research UK BIDD [A12617] 'PredicTr-OPC Biomarker classifiers to predict prognosis following treatment of oropharyngeal carcinoma' ~£0.1M
- 2009-2011 Cancer Research UK TRICC [C2094/A11365] BCON-TRANS 'Investigation of the ability of a hypoxia-associated signature to predict benefit from hypoxia-modifying therapy' ~£0.1M
- 2008-2011 Medical Research Council [G0801525] 'Validation of a multiplex hypoxia biomarker' ~£0.9M
- 2006-2008 Cancer Research UK TRICC [C602/A6777] 'ABC Tamoxifen late relapse' ~£0.2M

Other grants

I also hold/held many additional smaller grants both as principal investigator and co-investigator; and I am collaborator on several grants, including large ones e.g. the Stratification of Colorectal Cancer UK-wide multidisciplinary consortium (<https://www.scort.org.uk>)

Patents and Licenses

- 2019 Open License software *MeRLin*, web-tool for mining clinical genomic data
- 2018 Open License software *microC*, a 3D virtual environment for executable biology
- 2017 Licensed software *HTSense*, a web-tool for complex high-throughput screens
- 2011 Patent WO/2011/076895 'Hypoxia Tumor Markers'
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2011076895>
- 2008 Patent WO/2008/137090 'Knowledge-Based Proliferation Signatures'
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2008137090>

Publications in peer-reviewed journals

I published more than 150 peer-reviewed papers. My H-index is 63, i10-index 156 (Google Scholar). Listed below are selected publications illustrating contribution to the fields of computational biology, genomics/transcriptomics and cancer research. After, I list all other publications since 2011. Earlier publications omitted, but full list can be provided.

Selected publications

Taylor A, Macaulay VM, Miossec MJ, Maurya AK, Buffa FM. GeneFEAST: the pivotal, gene-centric step in functional enrichment analysis interpretation. *Bioinformatics*. 2025 Mar 4;41(3):btaf100. doi: 10.1093/bioinformatics/btaf100. PMID: 40037522; PMCID: PMC11919446.

Di Giovannantonio M, Hartley F, Elshenawy B, Barberis A, Hudson D, Shafique HS, Allott VES, Harris DA, Lord SR, Haider S, Harris AL, Buffa FM, Harris BHL (co-last, co-corresponding). Defining hypoxia in cancer: A landmark evaluation of hypoxia gene expression signatures. *Cell Genom.* 2025 Feb 12;5(2):100764. doi: 10.1016/j.xgen.2025.100764. Epub 2025 Jan 31. PMID: 39892389; PMCID: PMC11872601.

Jayathilake PG, Victori P, Pavillet CE, Lee CH, Voukantsis D, Miar A, Arora A, Harris AL, Morten KJ, Buffa FM. Metabolic symbiosis between oxygenated and hypoxic tumour cells: An agent-based modelling study. *PLoS Comput Biol.* 2024 Mar 15;20(3):e1011944. doi: 10.1371/journal.pcbi.1011944. PMID: 38489376; PMCID: PMC10971686.

Harris BHL, Di Giovannantonio M, Zhang P, Harris DA, Lord SR, Allen NE, Maughan TS, Bryant RJ, Harris AL, Bond GL, Buffa FM. New role of fat-free mass in cancer risk linked with genetic predisposition. *Sci Rep.* 2024 Mar 27;14(1):7270. doi: 10.1038/s41598-024-54291-7. PMID: 38538606; PMCID: PMC10973462.

Tangherloni A, Riva SG, Myers B, Buffa FM, Cazzaniga P. *MAGNETO: Cell type marker panel generator from single-cell transcriptomic data*. *J Biomed Inform.* doi: 10.1016/j.jbi.2023.104510. Online ahead of print (2023)

Domingo E, Rathee S, Blake A, Samuel L, Murray G, Sebag-Montefiore D, Gollins S, West N, Begum R, Richman S, Quirke P, Redmond K, Chatzipli A, Barberis A, Hassanieh S, Mahmood U, Youdell M, McDermott U, Koelzer V, Leedham S, Tomlinson I, Dunne P; S:CORT consortium; Buffa FM, Maughan TS (joint-last and co-corresponding). Identification and validation of a machine learning model of complete response to radiation in rectal cancer reveals immune infiltrate and TGF β as key predictors. *EBioMedicine.* 2024 Aug;106:105228. doi: 10.1016/j.ebiom.2024.105228. Epub 2024 Jul 16. PMID: 39013324; PMCID: PMC11663784.

Barberis A, Aerts HJWL, Buffa FM. Robustness and reproducibility for AI learning in biomedical sciences: RENOIR. *Sci Rep.* 2024 Jan 22;14(1):1933. doi:10.1038/s41598-024-51381-4. PMID: 38253545; PMCID: PMC10810363.

Triantafyllidis CP, Barberis A, Hartley F, Cuervo AM, Gjerga E, Charlton P, van Bijsterveldt L, Rodriguez JS, Buffa FM. A machine learning and directed network optimization approach to uncover TP53 regulatory patterns. *iScience.* 2023 Oct 26;26(12):108291. doi: 10.1016/j.isci.2023.108291. PMID:38047081; PMCID: PMC10692668.

Chauhan JS, Hölzel M, Lambert JP, Buffa FM (co-last and co-corresponding), Goding CR. *The MITF regulatory network in melanoma*. *Pigment Cell Melanoma Res.* 35(5):517-533. doi: 10.1111/pcmr.13053 (2022)

Ralli GP, Carter RD, McGowan DR, Cheng WC, Liu D, Teoh EJ, Patel N, Gleeson F, Harris AL, Lord SR, Buffa FM (co-last), Fenwick JD. *Radiogenomic analysis of primary breast cancer reveals [18F]-fluorodeoxyglucose dynamic flux-constants are positively associated with immune pathways and outperform static uptake measures in associating with glucose metabolism*. *Breast Cancer Res.* 2022 May 17;24(1):34. doi: 10.1186/s13058-022-01529-9.

Di Giovannantonio M, Harris BH, Zhang P, Kitchen-Smith I, Xiong L, Sahgal N, Stracquadanio G, Wallace M, Blagden S, Lord S, Harris D, Harris AHL, Buffa FM (co-last and co-corresponding), Bond GL. *Heritable genetic variants in key cancer genes link cancer risk with anthropometric traits*. *J Med Genet.*: jmedgenet-2019-106799 (2020)

Dhawan A, Barberis A, Cheng WC, Domingo E, West C, Maughan T, Scott JG, Harris AL, Buffa FM (corresponding). *Guidelines for using sigQC for systematic evaluation of gene signatures*. *Nature Protocols* 14(5):1377-1400. doi: 10.1038/s41596-019-0136-8 (2019)

Burdova K, Yang H, Faedda R, Hume S, Chauhan J, Ebner D, Kessler BM, Vendrell I, Drewry DH, Wells CI, Hatch SB, Dianov GL, Buffa FM, D'Angiolella V. *E2F1 proteolysis via SCF-cyclin F underlies synthetic lethality between cyclin F loss and Chk1 inhibition*. *EMBO J.* 38(20):e101443. doi:10.15252/embj.2018101443 (2019)

Voukantsis D, Kahn K, Hadley M, Wilson R, Buffa FM (corresponding). *Modeling genotypes in their microenvironment to predict single- and multi-cellular behaviour*. *Gigascience.* 8(3). pii: giz010. doi: 10.1093/gigascience/giz010. PMID: 30715320 (2019)

Lord SR, Cheng WC, Liu D, Gaude E, Haider S, Metcalf T, Patel N, Teoh EJ, Gleeson F, Bradley K, Wigfield S, Zois C, McGowan DR, Ah-See M, Thompson A, Sharma A, Bidaut L, Pollak M, Roy P, Karpe F, James T, English R, Adams R, Campo L, Ayers L, Snell C, Roxanis I, Frezza C, Fenwick J, Buffa FM (joint last), Harris AL. *Integrated Pharmacodynamic Analysis Identifies Two Metabolic Adaption Pathways to Metformin in Breast Cancer*. *Cell Metabolism* 28(5):679-688 (2018)

Dhawan A, Scott J, Harris AL, Buffa FM (corresponding). *Pan-cancer characterisation of microRNA across cancer hallmarks reveals microRNA mediated downregulation of tumour suppressors*. *Nature Communications*, 9 (1), 5228 (2018)

Haider S, McIntyre A, van Stiphout RG, Winchester LM, Wigfield S, Harris AL, Buffa FM (corresponding). *Genomic alterations underlie a pan-cancer metabolic shift associated with tumour hypoxia*. *Genome Biology* 17(1):140 (2016)

Mehta S, Hughes NP, Li S, Jubb A, Adams R, Lord S, Koumakis L, van Stiphout R, Padhani A, Makris A, Buffa FM (joint last and corresponding), Harris AL. *Radiogenomics Monitoring in Breast Cancer Identifies Metabolism and Immune Checkpoints as Early Actionable Mechanisms of Resistance to Anti-angiogenic Treatment*. *EBioMedicine.* (2016) 10109-16.

Masiero M, Costa Simões F, Dong Han H, Snell C, Peterkin T, Bridges E, Mangala L, Yen-Yao Wu S, Pradeep S, Li D, Han C, Dalton H, Lopez-Berestein G, Tuynman J, Mortensen N, Li J, Patient R, Sood AK, Banham A, Harris A, Buffa FM (corresponding). *A core human primary tumor angiogenesis signature identifies the endothelial orphan receptor ELTD1 as a key regulator of angiogenesis*. *Cancer Cell* 24229-41 (2013)

This paper was featured in Highlights, American Association of Cancer Research, Cancer Res 73; 5299 (2013)

Favaro E, Bensaad K, Chong MG, Tennant DA, Ferguson DJ, Snell C, Steers G, Turley H, Li JL, Günther UL, Buffa FM, McIntyre A, Harris AL. Glucose utilization via glycogen phosphorylase sustains proliferation and prevents premature senescence in cancer cells. *Cell Metab.* 16751-64. (2012)

Buffa FM (corresponding), Camps C, Winchester L, Snell CE, Gee HE, Sheldon H, Taylor M, Harris AL, Ragoussis J. *microRNA-associated progression pathways and potential therapeutic targets identified by integrated mRNA and microRNA expression profiling in breast cancer*. *Cancer Res.* 715635-45 (2011)

This paper has been featured in Key Paper Evaluation. Expert Rev Anticancer Ther 2012 Mar;12(3)323-30.

Korpai M, Ell BJ, Buffa FM, Ibrahim T, Blanco MA, Celià-Terrassa T, Mercatali L, Khan Z, Goodarzi H, Hua Y, Wei Y, Hu G, Garcia BA, Ragoussis J, Amadori D, Harris A, Kang Y. *Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization*. *Nature Med* 171101-8 (2011)

Moskwa P, Buffa FM, Pan Y, Panchakshari R, Gottipati P, Muschel R, Beech J, Kulshrestha R, Abdelmohsen K, Weinstock D, Gorospe M, Harris A, Helleday T, Chowdhury D. *miR-182-mediated downregulation of BRCA1 impacts DNA repair and sensitivity to PARP inhibitors*. *Mol Cell* 41210-20 (2011)

Buffa FM (corresponding), Harris AL, West CM, Miller CJ. *Large-meta analysis of multiple cancers reveals a common, compact and highly prognostic hypoxia metagene*. *Br J Cancer* 102428-35 (2010)

Higgins GS, Harris AL, Prevo R, Helleday T, McKenna WG, Buffa FM (corresponding). *Overexpression of POLQ confers a poor prognosis in early breast cancer patients*. *Oncotarget* 1175-84 (2010)

Chalmers AJ, Bentzen SM, Buffa FM. *A general framework for quantifying the effects of DNA repair inhibitors on radiation sensitivity as a function of dose*. *Theor Biol Med Model.* 19;4:25 (2007)

Generali D, Buffa FM (joint first), Berruti A, Brizzi MP, Campo L, Bonardi S, Bersiga A, Allevi G, Milani M, Aguggini S, Papotti M, Dogliotti L, Bottini A, Harris AL, Fox SB. *Phosphorylated ERα, HIF-1α and MAPK signalling, as predictors of primary endocrine treatment response and resistance in breast cancer patients*. *J Clin Oncol* 27227-234 (2009)

Gee HE, Camps C, Buffa FM, Colella S, Sheldon H, Gleadle JM, Ragoussis J, Harris AL. *MicroRNA-10b and breast cancer metastasis*. *Nature.* 455E8-9 (2008)

Winter SC, Buffa FM (joint first), Silva P, Miller C, Valentine HR, Turley H, Shah KA, Cox GJ, Corbridge RJ, Homer JJ, Musgrove B, Slevin M, Sloan P, Price P, West C, Harris AL. *Relation of a hypoxia metagene derived from head and neck cancer to prognosis of multiple cancers*. *Cancer Res* 673441-9 (2007)

Buffa FM (corresponding), Bentzen SM, Daley FM, Dische S, Saunders MI, Richman PI, Wilson GD. *Molecular marker profiles predict loco-regional control of head and neck squamous cell carcinoma in a randomized trial of continuous hyperfractionated accelerated radiotherapy*. *Clin Cancer Res* 10 3745-3754 (2004)

This paper has been featured in Press Release, American Association of Cancer Research (Nov. 2003)

Other peer-reviewed publications since 2011

Mahmood U, Blake A, Rathee S, Samuel L, Murray G, Sebag-Montefiore D, Gollins S, West NP, Begum R, Bach SP, Richman SD, Quirke P, Redmond KL, Salto-Tellez M, Koelzer VH, Leedham SJ, Tomlinson I, Dunne PD, Buffa FM; S:CORT consortium; Maughan TS, Domingo E. *Stratification to Neoadjuvant Radiotherapy in Rectal Cancer by Regimen and Transcriptional Signatures*. *Cancer Res Commun.* 2024 Jul 1;4(7):1765-1776. doi: 10.1158/2767-9764.CRC-23-0502. PMID: 39023969; PMCID: PMC11257085.

Charlton PV, O'Reilly D, Philippou Y, Rao SR, Lamb ADG, Mills IG, Higgins GS, Hamdy FC, Verrill C, Buffa FM, Bryant RJ (co-corresponding). *Molecular analysis of archival diagnostic prostate cancer biopsies identifies genomic similarities in cases with progression post-radiotherapy, and those with de novo metastatic disease*. *Prostate.* 2024 Jul;84(10):977-990. doi: 10.1002/pros.24715. Epub 2024 Apr 23. PMID: 38654435; PMCID: PMC11253896.

Schoenpflug LA, Chatzipli A, Sirinukunwattana K, Richman S, Blake A, Robineau J, Mertz KD, Verrill C, Leedham SJ, Hardy C, Whalley C, Redmond K, Dunne P, Walker S, Beggs AD, McDermott U, Murray GI, Samuel LM, Seymour M, Tomlinson I, Quirke P; S:CORT consortium; Rittscher J, Maughan T, Domingo E, Koelzer VH. *Tumour purity assessment with deep learning in colorectal cancer and impact on molecular analysis*. *J Pathol.* 2025 Feb;265(2):184-197. doi: 10.1002/path.6376. Epub 2024 Dec 22. PMID: 39710952; PMCID: PMC11717495.

Tan KL, Haider S, Zois CE, Hu J, Turley H, Leek R, Buffa F, Acuto O, Harris AL, Pezzella F. *Low cytoplasmic NUB1 protein exerts hypoxic cell death with poorer prognosis in oestrogen receptor negative breast cancer patients*. *Transl Oncol.* 2024 Nov;49:102106. doi: 10.1016/j.tranon.2024.102106. Epub 2024 Aug 24. PMID: 39182365; PMCID: PMC11387679.

Yang H, Fouad S, Smith P, Bae EY, Ji Y, Lan X, Van Ess A, Buffa FM, Fischer R, Vendrell I, Kessler BM, D'Angiolella V. Cyclin F-EXO1 axis controls cell cycle-dependent execution of double-strand break repair. *Sci Adv.* 2024 Aug 9;10(32):eado0636. doi: 10.1126/sciadv.ado0636. Epub 2024 Aug 9. PMID: 39121215; PMCID: PMC11313846.

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Rao S, Verrill C, Cerundolo L, Alham NK, Kaya Z, O'Hanlon M, Hayes A, Lambert A, James M, Tullis IDC, Niederer J, Lovell S, Omer A, Lopez F, Leslie T, Buffa F, Bryant RJ, Lamb AD, Vojnovic B, Wedge DC, Mills IG, Woodcock DJ, Tomlinson I, Hamdy FC. Intra-prostatic tumour evolution, steps in metastatic spread and histogenomic associations revealed by integration of multi-region whole-genome sequencing with histopathological features. *Genome Med.* 2024 Feb 19;16(1):35. doi: 10.1186/s13073-024-01302-x. PMID: 38374116; PMCID: PMC10877771.

Rodriguez-Berriguete G, Puliyadi R, Machado N, Barberis A, Prevo R, McLaughlin M, Buffa FM, Harrington KJ, Higgins GS. Antitumour effect of the mitochondrial complex III inhibitor Atovaquone in combination with anti-PD-L1 therapy in mouse cancer models. *Cell Death Dis.* 2024 Jan 11;15(1):32. doi:10.1038/s41419-023-06405-8. PMID: 38212297; PMCID: PMC10784292.

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Chen Z, Ioris RM, Richardson S, Van Ess AN, Vendrell I, Kessler BM, Buffa FM, Busino L, Clifford SC, Bullock AN, D'Angiolella V. Disease-associated KBTBD4 mutations in medulloblastoma elicit neomorphic ubiquitylation activity to promote CoREST degradation. *Cell Death Differ.* 29(10):1955-1969. doi: 10.1038/s41418-022-00983-4 (2022)

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- Victori P, Buffa FM (corresponding). *The many faces of mathematical modelling in oncology*. Br J Radiol. 92(1093): 20180856. doi: 10.1259/bjr.20180856 (2019)
- O'Cathail SM, Buffa FM (corresponding). *Science in Focus: Bioinformatics Part 1 - Lost in Translation*. Clin Oncol (R Coll Radiol). 2019 Jun;31(6):337-340. doi: 10.1016/j.clon.2019.03.043. Epub 2019 Apr 8. PubMed PMID: 30975523.
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- Favaro E, Lord S, Harris AL, Buffa FM (corresponding). *Gene expression and hypoxia in breast cancer*. Genome Medicine 3(8):55 (2011)
- McCormick R, Buffa FM, Ragoussis J, Harris AL. *The role of hypoxia regulated microRNAs in cancer*. Curr Top Microbiol Immunol 34547-70 (2010)
- Jubb AM, Buffa FM (joint first), Harris AL. *Assessment of tumor hypoxia for prediction of response to therapy and cancer prognosis*. J Cell Mol Med 1418-29 (2009)

Bentzen SM, Buffa FM, Wilson G. *Multiple biomarker tissue microarrays Bioinformatics and practical approaches*. Cancer and Metastasis Review 27(3)481-94 (2008)

Book chapters

Buffa FM and Harris AL. *Diagnostic and prognostic biomarkers*, Cancer Systems Biology, Bioinformatics and Medicine Research and Clinical Applications. Eds F. Marcus and A. Cesario. Springer (2011)

Buffa FM. *Fundamental Radiobiology and its Application to Radiation Oncology*. NATO Science for Peace and Security B Physics and Biophysics. Springer 2009 ISBN 978-90-481-3095-5

Interviews (Selected)

2023 Snack News, CorriereTV, Corriere della Sera (March 2023) <https://video.corriere.it/intelligenza-artificiale-ci-salvera-o-dobbiamo-aver-paura-futuro/ee5aa168-d1f5-11ed-89c0-c0954998de15>

2023 Wired, Milan, Italy (Feb 2023) <https://www.wired.it/video/watch/wired-health-2023-tumori-big-data>

Invited Talks since 2015 (Selected)

2025 Invited Talk, European Association for Cancer Research, Lisbon, Portugal

2025 Invited Talk "Unlocking cancer's secrets: From AI to virtual cells", NextOncology, Milan, Italy

2024 Keynote, 21st IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB) 2024, Natal, Brasil

2024 Invited Talk, Maths4Health, Milan, Italy

2024 Invited Talk, EliXir, Milan, Italy

2024 Invited Talk, Challenges in Clinical Research Meeting, ASST Grande Ospedale Metropolitano Niguarda

2023 Keynote, L.I.T.A Annual Conference, Università Statale di Milano, Milan, Italy

2023 Keynote, European Association of Nuclear Medicine EANM Annual Conference, Vienna, Austria (Sept 2023)

2023 We Make The Future - WMF, Rimini, Italy (June 2023)

2023 IFOM ETS - the AIRC Institute of Molecular Oncology, Milan, Italy (May 2023)

2023 Astra Zeneca Annual Workshop, Bologna, Italy (March 2023)

2023 Next Generation Sequencing Symposium, Milan, Italy (Feb 2023)

2022 Computational Aspects and Modeling of Biological Information (CAMBI), Milan, Italy (Dec 2022)

2022 Bocconi International Advisory Committee, Bocconi University, Milan, Italy (Dec 2022)

2022 Tumour Microenvironment Symposium, Berlin, Germany (Nov 2022)

2022 iCAN Digital Precision Cancer Medicine Flagship, Helsinki, Finland (Sept 2022)

2022 Looking4, University of Pavia, Pavia, Italy (July 2022)

2022 Computer Sciences Seminar Series, University of Surrey, Surrey, UK (March 2022)

2021 XXXI Congresso Nazionale AIRO, Bologna, Italy (October 2021)

2021 Tsukuba Global Science Week 2021, Tsukuba International Center for Digital Biotechnology -Toward the Next Generation of International Collaborative Research on Medicine and Food (Sept 2021)

2021 Festival of Genomics & BioData (<https://www.festivalofgenomics.com/>) (Jan 2021)

2020 ESTRO 2020 conference. Invited Lecture for the Cutting-edge Genomics in Radiation Oncology Symposium (online - Nov 2020)

2020 Keynote speaker at the International Synthetic & Systems Biology Summer School (SSBSS), Scuola Normale Superiore in Pisa, Italy (June 2020, moved to date TBC)

2020 King Abdulaziz University-Oxford University Bio-Innovation Symposium, Jeddah, Saudi Arabia. Invited talk (March 2020, moved to date TBC)

2020 UiO:Life Science, Novel Methods for Personalised Cancer Medicine, Oslo. Invited talk (February 2020)

2020 16th International Wolfsberg Meeting on Molecular Radiation Biology/Oncology, Invited Talk (June 2020)

2019 NCMM EMBL Partner Network, Oslo, Norway Invited talk: 'Big Data and Systems Medicine'

2018 International Festival of Robotics, Scuola Normale Superiore and Scuola Superiore Sant'Anna, Pisa, Italy. Keynote Address 'Big Data and Systems Medicine'

- 2018 RIKEN, Tokyo, Japan. Invited Seminar 'miRNA dysregulation in cancer'
- 2018 AACR Conference, Chicago, USA. Invited Talk 'Multi-omic approaches to personalized medicine'
- 2017 BioData EU 2017, Cambridge, UK. Invited Lecture 'Systems approaches to stratified medicine'
- 2017 Tsukuba University, Japan. Invited Seminar 'Computational approaches to Personalized Medicine'
- 2017 The Oliver Scott and Jack Fowler Memorial Symposium, Oxford, UK. Invited Lecture 'Personalized therapies challenges and new possibilities for computational modelling',
- 2017 Association for Radiation Research (ARR) Annual Conference. Invited Lecture 'Multi-omic systems approaches to stratified medicine'
- 2016 Computational and Molecular Biology Symposium 2016, Dublin, Ireland. Keynote Lecture 'In-silico analysis and modelling of the tumour microenvironment',
- 2016 RNAi2016, Oxford. Invited Talk 'Role of the miRNA processing machinery in cancer progression'
- 2016 European Network for Breast Development and Cancer (ENBDC), Weggis, Switzerland. Keynote Lecture 'Systems approaches to cancer biomarker discovery'
- 2016 Microsoft Research Cancer Workshop, Cambridge, UK. Invited Talk 'Systems approaches to cancer biomarker discovery'
- 2016 MRC Stratified Medicine Initiative, London. Invited Talk 'Analytical challenges in stratified medicine'
- 2015 AstraZeneca-MedImmune Cambridge Cancer Science Symposium, Cambridge, UK. Invited Talk 'Systems approaches to biomarker discovery'

3. University Lectures and Classes

Undergraduate Courses

- Since 2023 Course Director, Evolutionary Programming, Bachelor in Artificial Intelligence, Bocconi University, Italy https://didattica.unibocconi.it/ts/tsn_anteprema.php?cod_ins=30592&anno=2024&IdPag=7399
- Since 2023 Course Director, Information Theory, Bachelor in Artificial Intelligence, Bocconi University, Italy https://didattica.unibocconi.it/ts/tsn_anteprema.php?cod_ins=30592&anno=2024&IdPag=7399
- Since 2022 Course Director, Artificial Intelligence Lab, Bachelor in Artificial Intelligence, Bocconi University, Italy https://didattica.unibocconi.it/ts/tsn_anteprema.php?cod_ins=30557&anno=2024&IdPag=7399

Master's and Doctoral Courses

- Since 2025 Course Director, Artificial Intelligence Module 1, MSc in Data Analytics and AI in Health Sciences, Bocconi University and Humanitas University (Co-developer of the MSc program)
- Since 2024 Course Director, Bioinformatics, Master in Artificial Intelligence, Bocconi University, Italy
- Since 2024 Course Director, Machine Learning Lab, Master in Artificial Intelligence, Bocconi University, Italy https://didattica.unibocconi.it/ts/tsn_anteprema.php?cod_ins=20880&anno=2024&IdPag=7399
- Since 2023 Faculty, PhD in Statistics and Computer Science, Bocconi University, Milan, Italy https://www.unibocconi.it/wps/wcm/connect/bocconi/sitopubblico_it/albero+di+navigazione/home/corsi+di+studio/dottorati/statistics+and+computer+science/
- Since 2015 Faculty, PhD School "Scienze Biomediche e Biotecnologiche" Ferrara University, Italy <http://sm.unife.it/it/ricerca-e-terza-missione/ricerca-1/ambiti/biomedbiotec/supervisors/supervisors>
- 2019-2023 Faculty, Bioinformatics, Master's/Doctoral Tsukuba Life Science Innovation, Tsukuba
- 2017-2023 Faculty, Master's and Doctoral Program in Life Science Innovation, University Tsukuba, Japan
- 2018-2022 Faculty, MSc in Personalized Medicine, University of Oxford
- 2009-2022 Faculty, MSc in Radiation Biology, University of Oxford.

Lecturing at others University Courses

- 2011-2018 Faculty, Bioinformatics, Master Class in Translational Research, Kings College London, UK
- 2004-2009 Faculty, Statistics, MSc in Radiation Biology, Gray Cancer Institute and UCL, London, UK
- 2001-2002 Lecturer, Monte-Carlo methods, PhD course, DKFZ, Heidelberg, Germany

4. Other Teaching and Student Supervision

Development, Design and Teaching of Advanced Courses

Additionally to my commitment to teaching traditional university courses (Section 3), I developed alternative teaching platforms to address the increasing demand for specific training in bioinformatics and computational sciences.

- Since 2019, termly Development of Bioinformatics courses, Bioinformatics Hub, University of Oxford, UK
- Since 2017, yearly Development and teaching of the Transcriptomics Advanced Course, Wellcome Genome Campus, Cambridge, UK
- 2013 Development and teaching, Cancer Bioinformatics Course, University of Oxford

Post-Graduate Teaching

- 2011-2018 Teaching Machine Learning and Statistical Methods at “Models in Radiation Oncology”, the European Society for Radiotherapy and Oncology (ESTRO) School
- 2006-2013 Teaching Bioinformatics at European School of Medical Physics, Advanced Study Institute
- 2008 Teaching Bioinformatics at EUROXY School, EU 6th framework programme
- 2000 Teaching Monte-Carlo methods and mathematical models at Radiation Oncology Course, ICR, UK

Supervision of students and postdoctoral scientists

Supervision of postdoctoral scientists

University of Oxford: Primary supervision 18 postdoc research fellows (5 working on the ERC programme, 5 working on EU projects; 5 working on the CRUK programme; and 3 in the Bioinformatics Hub); 2 research assistants (CRUK and ERC programmes); 2 Senior Bioinformaticians; 1 lecturer from University of Madrid, Spain; 1 senior researcher from FORTH, Greece. Co-supervision of 6 postdoc fellows at the Department of Oncology, Ludwig Cancer Institute, WIMM.

Bocconi University: Supervision of 3 postdoctoral scientists, 2 predoctoral research assistant.

IFOM: Supervision of 1 PhD student, 1 postdoctoral scientist, 1 Research Assistant

Supervision of students

Current supervisor of 11 D.Phil students and 2 MSc students at University of Oxford.

Previous primary supervisor of 3 D.Phil Students to completion; primary supervisor of several Oxford University MRes, MSc Students to completion; co-supervisor of 1 Ph.D. Student at University of Tsukuba. Supervisor of several internships, including funded by Erasmus and the International Atomic Energy Agency.

Destination of postdoctoral and students

Most of the students and postdocs I supervised went on to academic and research positions, at postdoc, team leader or assistant professor level in other Departments at the University of Oxford, University of Cambridge, at the ICR London, at the University of Pavia (Italy), Bocconi University (Italy), at RIKEN Research (Japan) and at Novartis Research (Switzerland). Five of my students also went on to continue their research as part of a medical career within the UK (NHS and private institutions), and institutions abroad (e.g. McGill Medical School, Canada; Cleveland Clinic, USA). Some postdoctoral joined industry (Merck Talent Programme, GlaxoSmithKline, Astra Zeneca, various biotech).

Advisor and Mentoring activity

- 2017-2022 Mentoring of academic staff, Department of Oncology pilot programme
- Since 2017 Member of Numerous Thesis Committees at University of Oxford, UK

5. University Examining

- Since 2022 Undergraduate and MSc programme admissions and exams
- Since 2019 DPhil and MRes Programmes Admission Panels, Department of Oncology, University of Oxford
- Since 2004 Examiner of several Master and Doctoral theses, both internal and external examiner, nationally (e.g. University College London, Kings College London, Cambridge) and internationally (The Netherlands)
- Since 2001 Examiner of numerous Transfer Viva (probationary research student to MRes and DPhil status), and Confirmation Viva of DPhil status

6. Commission of Trust and Broader Contribution

National and International Expert Panels

- Since 2023 Evaluator, recruitment panel, KTH Royal Institute of Technology and Karolinska Institutet, Sweden
- Since 2023 Panel member, Selections for the National Facility for Data Handling and Analysis, Italy

Since 2020	Scientific Advisory Board Member, iCAN Network for Digital Precision Cancer Medicine Flagship, Finland (https://www.digitalprecisioncancermedicine.fi/)
2020-2022	Advisor for the NIHR Urgent Public Health Group COVID-19 Prioritization Panel (Statistics and Research Methodology)
2017-2022	Member of the UK Research Excellence Framework 2021 (REF2021), both for the Criteria Setting and Evaluation Phases. Member of the Biological Science A5 Panel and Interdisciplinary Research Panel.
2016-2018	Cancer Research UK (CR-UK) Experimental Medicine Expert Review Panel
2016	MRC Stratified Medicine Strategic document review
2013-2018	National Institute for Health Research (NIHR) Statistics Group
2013-2015	CR-UK Science Committee, CR-UK Biomarker Expert Review Panel
2013	NCRI Clinical and Translational Radiotherapy Research National Working Group Advisor (2013)
2010	NCRI ONIX Bioinformatics Platform Member, User Group (2010)

National and International Grant Panels (Selected)

2021-2022	Research Council of Norway, 2021 Grant Evaluation Panel
2018	Swiss Bridge Award Committee
2018	Breast Cancer Now Programme Review Committee
2015	FCT Portugal Scientific Research & Technological Development National Review Panel
2010-2016	Recurrent member of Horizon2020 EU Grant Panels (1-2 panels per year)
2010-2021	Recurrent member of CRUK, MRC and Breast Cancer Now panels

National and International Conference Panels (Selected)

2021	RuleML+RR 2021 Conference Programme Committee
2017-2019	National Cancer Research Institute (NCRI) Conference Advisory Panel

Committees and commissions of trust within Bocconi University

Since 2023	Bocconi's Committee for Appointments and Promotions (CAP)
Since 2022	University Ethics Committee
Since 2022	High Performance Computing committee, Computing Science Department
2023	Recruitment Committee, Department of Computing Sciences

Committees and commissions of trust within University of Oxford

Since 2019	Reviewer for the departmental assessment of the Scientific Research Facilities
Since 2019	DPhil and MSc Admissions, including shortlisting, interviewing and admission
Since 2019	Chair of the Bioinformatics Hub Steering Committee
Since 2018	Member of the Training and Development Committee, Department of Oncology
Since 2015	Academic Lead for Bioinformatics, Department of Oncology.
Since 2015	CR-UK Oxford Centre Research Committee Grant Panel
2019	Excellence Review Schema, Department of Oncology
2017-2019	Radiotherapy and Imaging Trial Oversight Committee, Clinical Trial Unit, Dept of Oncology
2015	Academic Steering Group for Bioinformatics, Department of Oncology
2014-2018	Athena Swan SAT, Department of Oncology

Other service activity

Since 2024	Senior Editor, Molecular Cancer Research, AACR
Since 2017	F1000 Prime Faculty Member, Genomics and Genetics Faculty
Since 2023	Scientific Committee, EGEA Editing Group
2016-2021	Associate Editor, IEEE Journal of Biomedical and Health Informatics
2018	AACR Invited Membership
2007-2009	Member of the Editorial Advisory Board of Physics in Medicine and Biology (2007-2009).

Manuscript Refereeing (selected)

Nature Genetics, Journal of the National Cancer Institute, Cell Systems, Cancer Research, Nature Communications, Scientific Reports, CMB Systems Biology, IEEE journals, PLoS Genetics, Molecular Cancer, BMC Bioinformatics, Nature Clinical Practice Oncology, British Journal of Radiology, Radiation Research, Medical Physics, Physics in Medicine and Biology, Eur. J. Nuclear Medicine and Molecular Imaging

Grant Reviewing (selected)

European Research Council; Horizon 2020 Framework; SwissBridge; UK Research Institute; Medical Research Council; Cancer Research UK; Breast Cancer Research; Research Council of Norway; Health Research Council New Zealand; FCT Portugal Scientific Research & Technological Development; Dutch Cancer Society; Health Research Board Ireland.

2015-present **Public engagement and 'Lay' talks** to Secondary Schools, and Cancer Research UK fundraisers