
BIOGRAPHICAL SKETCH

NAME: **Enrica Bianchi**ORCID ID: [0000-0001-8124-7328](https://orcid.org/0000-0001-8124-7328)

POSITION TITLE: Ricercatore (RTDb)/ Assistant professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of Bologna, Italy	BS	09/1994	12/1999	Biological Sciences
University of Rome 'Tor Vergata', Italy	PhD	09/2004	09/2007	Reproduction and Development
University of Rome 'Tor Vergata', Italy	Postdoctoral Fellow	10/2007	11/2009	Molecular Biology and Reproduction
Wellcome Trust Sanger Institute, UK	Postdoctoral Fellow	05/2011	01/2017	Cell membrane proteins, fertilization

A. Personal Statement

My main scientific interest is mammalian reproduction and I have a deep fascination for the mechanism of fertilization. During my PhD at the University of Rome 'Tor Vergata' in Italy, I investigated the role of an RNA-binding protein in female reproduction using the mouse as a model organism. I continued the project as a postdoctoral fellow and altogether I published 6 papers in international journals, 4 of which as first author. In 2011 I joined the lab of Professor Gavin Wright at the Wellcome Sanger Institute in Cambridge (UK) to study the interaction of cell surface proteins involved in fertilization. By using technologies specifically developed in the lab to investigate protein-protein interactions I was able to identify the first binding pair of proteins, JUNO and IZUMO1, which are essential for fertilization. My previous experience with animal models and with the manipulation of gametes was instrumental to the swift and successful conclusion of the project. The discovery was published as a full article in Nature and has rapidly become a highly cited paper. This has given me the opportunity to present my research in many international meetings, to set up collaborations with groups in Sweden (Prof. Luca Jovine), Spain (Prof. Maria Jimenez-Movilla) and Israel (Prof. Amiram Glodblum), to invitations to review grants for different funding bodies, and to review articles for peer-reviewed journals. My latest work on a receptor required for embryo transport named ADGRD1 has been published in Nature Communications in 2021 and has been presented at different international conferences. While in the Wright lab, I have contributed to obtaining grants from UK research councils (MRC, BBSRC) and from the Bill & Melinda Gates Foundation. In January 2024 I moved back to my home country to take up the position of Assistant

Professor (RTDb) at the University of Rome, Tor Vergata, in the Department of Biomedicine and Prevention, section of Histology, where I will continue to investigate the role of cell membrane proteins in fertilization using in vitro assays and biochemical approaches combined with animal model systems.

B. Positions and Scientific Appointments

2024- present Basic Science officer, Special Interest Group Embriology, European Society of Human Reproduction and Embryology
2024-present Member of the Scientific Committee of SIERR (Società Italiana di Embriologia, Riproduzione e Ricerca)
2024- present Assistant Professor (Ricercatore RTDb), University of Rome 'Tor Vergata', Italy
2021- 2023 Research Fellow at the Biology Department, University of York, UK.
2017-2021 Staff scientist at the Wellcome Trust Sanger Institute, Cambridge, UK.
2011-2017 Post-doctoral fellow, Wellcome Trust Sanger Institute, Cambridge, UK.
2008-2009 Post-doctoral fellow, University of Rome Tor Vergata, Italy

C. Contributions to Science

Mammalian fertilization: the identification of the first binding pair of cell membrane proteins essential for fertilization has contributed to the understanding of molecular mechanisms underlying fertilization and spurred new interested in the field (Bianchi E. et al., Nature, 2014). Thanks to various collaborations I contributed to studying other proteins essential for mammalian fertilization like TMEM95 (Lamas-Toranzo I et al., eLife, 2020) and more recently to the prediction of a complex (Elofsson A et al., eLife, 2024) formed during the sperm-egg interaction.

Embryo transport: the previously unreported role of the G-protein coupled receptor, Adgrd1, in reproduction, highlighted the critical role of oviductal fluid flow in the transport of embryos to the uterus (Bianchi E. et al, Nat Comms, 2021).

PUBLICATIONS

1. Elofsson A, Han L, **Bianchi E**, Wright GJ, Jovine L (2024). Deep learning insights into the architecture of the mammalian egg-sperm fusion synapse. **eLife** 13:RP93131 [10.7554/eLife.93131.2](https://doi.org/10.7554/eLife.93131.2)
2. **Bianchi E**, Jiménez-Movilla M, Cots-Rodríguez P, Viola C, Wright GJ (2024). No evidence for a direct extracellular interaction between human Fc receptor-like 3 (MAIA) and the sperm ligand IZUMO1. **Sci Adv.** Feb 23;10(8):eadk6352. [10.1126/sciadv.adk6352](https://doi.org/10.1126/sciadv.adk6352)

3. **Bianchi E**, Wright GJ (2023) Mammalian fertilization: does sperm IZUMO1 mediate fusion as well as adhesion? *Journal of Cell Biology* Feb 6;222(2):e202301035 [10.1083/jcb.202301035](https://doi.org/10.1083/jcb.202301035)
4. Makieva S, Fraire-Zamora JJ, Mincheva M, Uraji J, Ali ZE, Ammar OF, Liperis G, Serdarogullari M, **Bianchi E**, Pettitt J, Sermon K, Bhattacharya S, Massarotti C (2023) #ESHREjc report: failed fertilization: is genetic incompatibility the elephant in the room? *Human Reproduction* Feb 1;38(2):324-327 [10.1093/humrep/deac265](https://doi.org/10.1093/humrep/deac265)
5. **Bianchi E**, Jimenez-Movilla M, Krauchunas AR (2022). Editorial: Fertilization in the spotlight: Dynamics and mechanisms of sperm-egg interaction. *Frontiers in Cell and Developmental Biology* Sep 8;10:993865 [10.3389/fcell.2022.993865](https://doi.org/10.3389/fcell.2022.993865)
6. Stepanenko N, Wolk O, **Bianchi E**, Wright GJ, Schachter-Safrai N, Makedonski K, Ouro A, Ben-Meir A, Buganim Y, Goldblum A (2022). In Silico Docking Analysis for Blocking JUNO-IZUMO1 Interaction Identifies Two Small Molecules that Block In Vitro Fertilization *Frontiers in Cell and Developmental Biology* Apr 5;10:824629 [10.3389/fcell.2022.824629](https://doi.org/10.3389/fcell.2022.824629)
7. **Bianchi E** (2021). Same gene, opposite sexes: Sex-specific divergent expression of a gene required for vertebrate fertilization *Proc Natl Acad Sci* 118(42):e2116001118. [10.1073/pnas.2116001118](https://doi.org/10.1073/pnas.2116001118)
8. **Bianchi E**, Sun Y, Almansa-Ordóñez A, Woods M, Goulding D, Martínez-Martin N, Wright GJ (2021). Control of oviductal fluid flow by the G-protein coupled receptor Adgrd1 is essential for murine embryo transit. *Nature Communications* 12(1):1251. [10.1038/s41467-021-21512-w](https://doi.org/10.1038/s41467-021-21512-w)
9. **Bianchi E**, Wright GJ (2020) Find and fuse: Unsolved mysteries in sperm–egg recognition *PLoS Biology* 18(11): e3000953. doi.org/10.1371/journal.pbio.3000953
10. Lamas-Toranzo I, Hamze JG, **Bianchi E**, Fernández-Fuertes B, Pérez-Cerezales S, Laguna-Barraza R, Fernández-González R, Lonergan P, Gutiérrez-Adán A, Wright GJ, Jiménez-Movilla M, Bermejo-Álvarez P. (2020). TMEM95 is a sperm membrane protein essential for mammalian fertilization. *Elife* 9:e53913. [10.7554/eLife.53913](https://doi.org/10.7554/eLife.53913)
11. **Bianchi E**, Wright GJ (2016). Sperm Meets Egg: The Genetics of Mammalian Fertilization. *Annual Review of Genetics* 50:93-111. [10.1146/annurev-genet-121415-121834](https://doi.org/10.1146/annurev-genet-121415-121834)
12. Nishimura K, Han L, **Bianchi E**, Wright GJ, de Sanctis D, Jovine L. (2016). The structure of sperm Izumo1 reveals unexpected similarities with Plasmodium invasion proteins. *Current Biology* 26(14):R661-2. [10.1016/j.cub.2016.06.028](https://doi.org/10.1016/j.cub.2016.06.028)
13. Han L, Nishimura K, Sadat Al Hosseini H, **Bianchi E**, Wright GJ, Jovine L. (2016). Divergent evolution of vitamin B9 binding underlies Juno-mediated adhesion of mammalian gametes. *Current Biology* 8;26(3):R100-1. [10.1016/j.cub.2015.12.034](https://doi.org/10.1016/j.cub.2015.12.034)
14. Wright GJ, **Bianchi E** (2015). The challenges involved in elucidating the molecular basis of sperm-egg recognition in mammals and approaches to overcome them. *Cell and Tissue Research* 363(1):227-35. [10.1007/s00441-015-2243-3](https://doi.org/10.1007/s00441-015-2243-3)
15. **Bianchi E**, Wright GJ (2015). Cross-species fertilization: the hamster egg receptor, Juno, binds the human sperm ligand, Izumo1. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* 370(1661):20140101. [10.1098/rstb.2014.0101](https://doi.org/10.1098/rstb.2014.0101)

16. **Bianchi E**, Wright GJ (2014). Izumo meets Juno: Preventing polyspermy in fertilization. *Cell Cycle* 13(13):2019–2020. [10.4161/cc.29461](https://doi.org/10.4161/cc.29461)
17. **Bianchi E**, Doe B, Goulding D, Wright GJ (2014). Juno is the egg Izumo receptor and is essential for mammalian fertilization. *Nature* 508(7497):483-7. [10.1038/nature13203](https://doi.org/10.1038/nature13203)
18. De Cola A, Bongiorno-Borbone L, **Bianchi E**, Barcaroli D, Carletti E, Knight RA, Di Ilio C, Melino G, Sette C, De Laurenzi V (2012). FLASH is essential during early embryogenesis and cooperates with p73 to regulate histone gene transcription. *Oncogene* 31(5):573-82. [10.1038/onc.2011.274](https://doi.org/10.1038/onc.2011.274)
19. Bianchi E, Sette C (2011). Post-transcriptional control of gene expression in mouse early embryo development: a view from the tip of the iceberg. *Genes* 2:345-359. [10.3390/genes2020345](https://doi.org/10.3390/genes2020345)
20. **Bianchi E**, Barbagallo F, Valeri C, Geremia R, Salustri A, De Felici M, Sette C. (2010). Ablation of the Sam68 gene impairs female fertility and gonadotropin-dependent follicle development. *Human Molecular Genetics* 19(24):4886-94. [10.1093/hmg/ddq422](https://doi.org/10.1093/hmg/ddq422)
21. **Bianchi E**, Geremia R, Sette C (2010). Expression of stemness markers in mouse parthenogenetic-diploid blastocysts is influenced by slight variation of activation protocol adopted. *In vitro cellular and Developmental Biology-Animal* 46(7):619-23. [10.1007/s11626-010-9312-4](https://doi.org/10.1007/s11626-010-9312-4)
22. Paronetto MP, Messina V, **Bianchi E**, Barchi M, Vogel G, Moretti C, Palombi F, Stefanini M, Geremia R, Richard S, Sette C (2009). Sam68 regulates translation of target mRNAs in male germ cells, necessary for mouse spermatogenesis. *The Journal of Cell Biology* 185(2):235-49. [10.1083/jcb.200811138](https://doi.org/10.1083/jcb.200811138)
23. Paronetto MP #, **Bianchi E** #, Geremia R, Sette C (2008). Dynamic expression of the RNA-binding protein Sam68 during mouse pre-implantation development. *Gene Expression Patterns* 8(5):311-322. # Equal contribution [10.1016/j.gep.2008.01.005](https://doi.org/10.1016/j.gep.2008.01.005)
24. Capri M, Scarcella E, Fumelli C, **Bianchi E**, Salvioli S, Mesirca P, Agostini C, Antolini A, Schiavoni A, Castellani G, Bersani F, Franceschi C (2004). *In vitro* exposure of human lymphocytes to 900 MHz CW and GSM modulated radiofrequency: studies on proliferation, apoptosis and mitochondrial membrane potential. *Radiation Research* 162(2):211-218. [10.1667/RR3209](https://doi.org/10.1667/RR3209)
25. Capri M, Scarcella E, **Bianchi E**, Fumelli C, Mesirca P, Agostini C, Schuderer J, Kuster N, Franceschi C, Bersani F (2004). 1800 MHz radiofrequency (mobile phones, different GSM modulations) does not affect apoptosis and Hsp70 level in peripheral blood mononuclear cells from young and old donors. *International Journal of Radiation Biology* 80(6):389-397. [10.1080/09553000410001702346](https://doi.org/10.1080/09553000410001702346)
26. Brasili P, **Bianchi E**, Ventrella AR (2004). Traumatic events and life-style in ancient Italian populations. *Collegium Antropologicum* 28(1):179-191.

Book Chapter:

Barchi M, Geremia R, Magliozzi R, **Bianchi E** (2009). Isolation and analyses of enriched populations of male mouse germ cells by sedimentation velocity: the centrifugal elutriation. *Methods in Molecular Biology. Meiosis Volume 2, Cytological Methods*, 558:299-321