

ROSER VENTO-TORMO, PhD

VenToLab.org | Wellcome Genome Campus, Cambridge (UK)

EDUCATION -

- 2019 **Group leader.** Wellcome Sanger Institute, Cambridge, UK
2016-2019 **Postdoctoral Fellow.** Sarah Teichmann, Wellcome Sanger Institute, Cambridge, UK
2011-2016 **Ph.D. Biomedicine/Immunology.** Esteban Ballestar, University of Barcelona, Spain
2009-2011 **M.Sc. Biomedical Biotechnology.** Polytechnic University of Valencia, Spain.
2004-2009 **B.Sc. Biotechnology.** Polytechnic University of Valencia, Spain.

FUNDING -

- 2024 **PI,** Incorporating immune cells into endometrial organoids, **The Milner Therapeutics Institute**
2023 **Co-PI,** Integrating tissue engineering and microfluidics to model the spatial niches of the human endometrium in vitro with guidance from in vivo multiomics data, **NIH**
2023 **Co-PI,** Female resilience on-chip, **Wellcome-LEAP**
2023 **PI,** Placentomics - Dissecting the regulatory mechanisms driving trophoblast cell fate, **ERC starting grant UKRI grant guarantee**
2023 **Co-PI,** Immerse – comprehensive CRISPR perturbations with multimodal readouts to unravel targets in immune cells, **Open Targets**
2022 **PI,** A single-cell map of the paediatric ovary in 3D, **CZI**

AWARDS AND PRIZES -

- 2023 **SRUK/CERU Emerging Talent Award**
2023 **Michelson Philanthropies & Science Magazine Prize for Immunology finalist award**
2021 **Biochemical Society Early Career Award.**
2017 **HFSP Long-Term Fellowship.** Wellcome-Trust Sanger Institute. Cambridge, United Kingdom. Supervisor: Sarah Teichmann, PhD
2016 **EMBO long-term Postdoctoral Fellowship.** Wellcome-Trust Sanger Institute. Cambridge, United Kingdom. Supervisor: Sarah Teichmann, PhD
2010 **PFIS Predoctoral Fellowship.** Competitive grant from the Spanish Ministry of Health PEBC, Barcelona, Spain. Supervisor: Esteban Ballestar, PhD
2010 **Best Final Project Undergraduate Awarded.** Polytechnic University of Valencia / Bancaja Award. Supervisors: Prof. Jose Ramón Murguía and Prof. José Gadea.

SELECTED PUBLICATIONS (H index 34) -

Publications arising from my independent laboratory: final and corresponding (*) author manuscripts

1. Lorenzi V, Mazzeo CI, Yayon N, Ruiz-Morales ER, Sancho-Serra C, Wong FCK, Marečková M, Tuck L, Roberts K, Li T, Jacques MA, He X, Barker R, Crespo B, Cakir B, Murray S, Prete M, Gu Y, Kelava I, Garcia-Alonso L*, Marioni JC*, **Vento-Tormo R***. Spatiotemporal map of the developing human reproductive tract at single-cell resolution. biorxiv (2024). doi: <https://doi.org/10.1101/2024.10.30.621114>.
2. Massalha H, Trinh MK, Armingol E, Tuck L, Predeus A, Mazin P, Sancho-Serra C, Oszlanczi A, Wood Y, Parks C, Ogbonah T, Whitfield HJ, Kelava I, Behjati S*, **Vento-Tormo R***, Schoenmakers N*. A developmental cell atlas of the human thyroid gland. biorxiv (2024). doi: <https://doi.org/10.1101/2024.08.22.609152>.
3. Aliee H, Kapl F, Pham D, Cakir B, Jimba T, Cranley J, Teichmann SA, Meyer KB*, **Vento-Tormo R***, Theis FJ*. inVAE: Conditionally invariant representation learning for generating multivariate single-cell reference maps. biorxiv (2024). doi: <https://doi.org/10.1101/2024.12.06.627196>.

4. Rodríguez-Ubrevia J, Calafell-Segura J, Calvillo CL, Keller B, Ciudad L, Handfield LF, de la Calle-Fabregat C, Godoy-Tena G, Andrés-León E, Hoo R, Porter T, Prigmore E, Hofmann M, Decker A, Martín J, **Vento-Tormo R***, Warnatz K*, Ballestar E*. COVID-19 progression and convalescence in common variable immunodeficiency patients show dysregulated adaptive immune responses and persistent type I interferon and inflammasome activation. **Nat Commun.** 2024 Nov 28;15(1):10344.
5. Marečková M, Garcia-Alonso L, Moullet M, Lorenzi V, Petryszak R, Sancho-Serra C, Oszlanczi A, Icoresi Mazzeo C, Wong F.C.K, Kelava I, Hoffman S, Krassowski M, Garbutt K, Kelava I, Gaitskell K, Yancheva S, Von Woon E, Male V, Granne I, Hellner K, Mahbubani KT, Saeb-Parsy K, Lotfollahi M, Prigmore E, Southcombe J, Dragovic RA, Becker CM, Zondervan KT*, **Vento-Tormo R***. An integrated single-cell reference atlas of the human endometrium. **Nat Genet.** 2024 Sep;56(9):1925-1937.
6. Hoo R, Ruiz-Morales ER, Kelava I, Rawat M, Mazzeo CI, Tuck E, Sancho-Serra C, Chelaghma S, Predeus AV, Murray S, Fernandez-Antoran D, Waller RF, Álvarez-Errico D, Lee MCS*, **Vento-Tormo R***. Acute response to pathogens in the early human placenta at single-cell resolution. **Cell Syst.** 2024 May 15;15(5):425-444.e9.
7. Li Q, Sharkey A, Sheridan M, Magistrati E, Arutyunyan A, Huhn O, Sancho-Serra C, Anderson H, McGovern N, Esposito L, Fernando R, Gardner L, **Vento-Tormo R***, Turco MY*, Moffett A*. Human uterine natural killer cells regulate differentiation of extravillous trophoblast early in pregnancy. **Cell Stem Cell.** 2024 Feb 1;31(2):181-195.e9.
8. Troule K, Petryszak R, Prete M, Cranley J, Harasty A, Tuong ZK, Teichmann SA, Garcia-Alonso L*, **Vento-Tormo R***. CellPhoneDB v5: inferring cell-cell communication from single-cell multiomics data. arxiv 2023. <https://doi.org/10.48550/arXiv.2311.04567>. **Nature Protocols In Press**
9. Arutyunyan A, Roberts K, Troulé K, Wong FCK, Sheridan MA, Kats I, Garcia-Alonso L, Velten B, Hoo R, Ruiz-Morales ER, Sancho-Serra C, Shilts J, Handfield LF, Marconato L, Tuck E, Gardner L, Mazzeo CI, Li Q, Kelava I, Wright GJ, Prigmore E, Teichmann SA, Bayraktar OA*, Moffett A*, Stegle O*, Turco MY*, **Vento-Tormo R***. Spatial multiomics map of trophoblast development in early pregnancy. **Nature.** 2023 Apr;616(7955):143-151.
10. Garcia-Alonso L, Lorenzi V, Icoresi Mazzeo C, Alves-Lopes JP, Roberts K, Sancho-Serra C, Engelbert J, Marečková M, Gruhn WH, Botting RA, Li T, Crespo B, van Dongen S, Kiselev V, Prigmore E, Moffett A, Chedotal A, Herbert M, Bayraktar O, Surani A, Haniffa M, **Vento-Tormo R***. Single-cell roadmap of human gonadal development. **Nature.** 2022 Jul;607(7919):540-547.
11. Alsinet C, Primo MN, Lorenzi V, Bello E, Kelava I, Jones CP, Vilarrasa-Blasi R, Sancho-Serra C, Knights AJ, Park JE, Wyspianska BS, Trynka G, Tough DF, Bassett A, Gaffney DJ*, Alvarez-Errico D*, **Vento-Tormo R***. Robust temporal map of human in vitro myelopoiesis using single cell genomics. **Nat Commun.** 2022 May 24;13(1):2885.
12. Rodríguez-Ubrevia J, Arutyunyan A, Bonder MJ, Del Pino-Molina L, Clark SJ, de la Calle-Fabregat C, Garcia-Alonso L, Handfield LF, Ciudad L, Andrés-León E, Krueger F, Català-Moll F, Rodríguez-Cortez VC, Polanski K, Mamanova L, van Dongen S, Kiselev VY, Martínez-Saavedra MT, Heyn H, Martín J, Warnatz K, López-Granados E, Rodríguez-Gallego C, Stegle O, Kelsey G, **Vento-Tormo R***, Ballestar E*. Single-cell Atlas of common variable immunodeficiency shows germinal center-associated epigenetic dysregulation in B-cell responses. **Nat Commun.** 2022 Apr 1;13(1):1779.
13. Garcia-Alonso L, Handfield L-F, Roberts K, Nikolakopoulou K, Gardner L, Fernando RC, Woodhams B, Arutyunyan A, Polanski K, Hoo R, Sancho-Serra C, Li T, Kwakwa K, Tuck E, Kleshchevnikov V, Tarkowska A, Porter T, Icoresi Mazzeo C, van Dongen S, Dabrowska M, Vaskivskyi V, Mahbubani KT, Park J-

E, Jimenez-Linan M, Campos L, Kiselev V, Lindskog C, Ayuk P, Prigmore E, Stratton MR, Saeb-Parsy K, Moffett A, Moore L, Bayraktar OA*, Teichmann SA*, Turco MY*, **Vento-Tormo R***. Mapping the temporal and spatial dynamics of the human endometrium in vivo and in vitro. **Nature Genetics**. 2021 Dec;53(12):1698-1711.

14. Molè MA, Coorens THH, Shahbazi MN, Weberling A, Weatherbee BAT, Gantner CW, Sancho-Serra C, Richardson L, Drinkwater A, Syed N, Engley S, Snell P, Christie L, Elder K, Campbell A, Fishel S, Behjati S*, **Vento-Tormo R***, Zernicka-Goetz M*. A single cell characterisation of human embryogenesis identifies pluripotency transitions and putative anterior hypoblast centre. **Nat Commun**. 2021 Jun 17;12(1):3679

15. Efremova M, Vento-Tormo M, Teichmann SA, **Vento-Tormo R*** CellPhoneDB: inferring cell-cell communication from combined expression of multi-subunit ligand-receptor complexes. **Nature Protocols**. 2020 Apr;15(4):1484-1506.

Publications arising from post-doctoral and PhD work

16. **Vento-Tormo R**, Efremova M, Botting RA, Turco MY, Vento-Tormo M, Meyer KB, Park JE, Stephenson E, Polański K, Goncalves A, Gardner L, Holmqvist S, Henriksson J, Zou A, Sharkey AM, Millar B, Innes B, Wood L, Wilbrey-Clark A, Payne RP, Ivarsson MA, Lisgo S, Filby A, Rowitch DH, Bulmer JN, Wright GJ, Stubbington MJT, Haniffa M, Moffett A, Teichmann SA. (2018) Single-cell reconstruction of the early maternal-fetal interface in humans. **Nature**. 2018 563(7731):347-353.

17. **Vento-Tormo R**, Álvarez-Errico D, Garcia-Gomez A, Hernández-Rodríguez J, Buján S, Basagaña M, Méndez M, Yagüe J, Juan M, Aróstegui JI, Ballestar E. DNA demethylation of inflammasome-associated genes is enhanced in patients with cryopyrin-associated periodic syndromes. **Journal of Allergy and Clinical Immunology**. 2017. 139(1):202-211.

18. **Vento-Tormo R**, Company C, Rodríguez-Ubrea J, de la Rica L, Urquiza JM, Javierre BM, Sabarinathan R, Luque A, Esteller M, Aran JM, Álvarez-Errico D, Ballestar E. IL-4 orchestrates STAT6-mediated DNA demethylation leading to dendritic cell differentiation. **Genome Biology**. 2016. 17(1):4.

19. **Vento-Tormo R**, Álvarez-Errico D, Rodríguez-Ubrea J, Ballestar E. Gains of DNA methylation in myeloid terminal differentiation are dispensable for gene silencing but influence the differentiated phenotype. **FEBS Journal**. 2015. 282, 1815-1825.

20. **Vento-Tormo R**, Rodríguez-Ubrea J, Lisio LD, Islam AB, Urquiza JM, Hernando H, López-Bigas N, Shannon-Lowe C, Martínez N, Montes-Moreno S, Piris MA, Ballestar E. NF- κ B directly mediates epigenetic deregulation of common microRNAs in Epstein-Barr virus-mediated transformation of B-cells and in lymphomas. **Nucleic Acids Research**. 2014. 42, 11025-11039

Reviews and comments

21. **Vento-Tormo R***, Vilarrasa-Blasi R. Cell-level reference maps for the human body take shape. **Nature**. 2023 Jul;619(7970):467-468.

22. Theis FJ, Dar D, **Vento-Tormo R**, Vicković S, Wang L, Kagohara LT, Rendeiro AF, Joyce JA. What do you most hope spatial molecular profiling will help us understand? **Cell Syst**. 2023 Jun 21;14(6):423-427.

23. **Vento-Tormo R***. Single-cell omics meets organoid cultures. **Nat Rev Genet**. 2023 Aug;24(8):492.

24. Garcia-Alonso L, Zondervan KT, **Vento-Tormo R***. A novel resource to study endometriosis at the single-cell level. **Nat Rev Endocrinol**. 2023 May;19(5):256-257.
25. **Vento-Tormo R***. Decoding foreign antigen tolerance. **Science**. 2023 Feb 17;379(6633):655.
26. Marečková M, Massalha H, Lorenzi V, **Vento-Tormo R***. Mapping Human Reproduction with Single-Cell Genomics. **Annu Rev Genomics Hum Genet**. 2022 Aug 31;23:523-547.
27. Hoo R, Nakimuli A, **Vento-Tormo R***. Innate immune mechanisms to protect against infection at the human maternal-fetal interface. **Front Immunol**. 2020 Sep 10;11:2070.
28. Svensson V, **Vento-Tormo R**, Teichmann SA. Exponential scaling of single-cell RNA-seq in the last decade. **Nature Protocols**. 2018 13(4):599-604
29. Álvarez-Errico D, **Vento-Tormo R**, Sieweke M & Ballestar E. Epigenetic control of myeloid cell differentiation, identity and function. **Nature Reviews Immunology**. 2014, 15, 7-17

SCIENCE COMMUNICATION -

Organiser & chair

- 2022-onwards Organiser of WCS - Single Cell Biology (2022, 2024)
- 2022 Chair of “predictive models of stem cell behaviour” at the ISSCR Annual Meeting
- 2020-2021 Co-chair of “The Wellcome Sanger Institute Seminar Series” (on-line, open)
- 2019-onwards Coordinator of the reproductive network from Human Cell Atlas (www.humancellatlas.org)

Selected invited speaker to international meetings (since being a group leader)

- 2024 4th Fusion Conference on Epigenetics, Malta (Italy)
- 2024 ECI (European Congress of Immunology), Dublin (Ireland)
- 2024 SRI (Society for Reproductive Investigation), Dublin (Ireland) (Keynote)
- 2024 ESHG (The European Society of Human Genetics), Berlin (Germany)
- 2024 EMBO meeting: Tissue-resident immune cells in health and disease, Marseille (France)
- 2023 MPS (MicroPhysiological Systems) World Summit, Berlin (Germany) (Keynote)
- 2023 ESHRE (European Society of Human Reproduction and Embryology), Copenhagen (Denmark)
- 2023 Spatial Multi-Omics symposia Lausanne (Switzerland).
- 2022 The power of genomic technologies, Cell Press conference, Shanghai, China (Virtual meeting)
- 2022 FEBS course: Exploring the human proteome, Stockholm (Sweden) (Keynote)
- 2022 Gordon Research Conference: Mammalian reproduction, Vermont (EEUU)
- 2022 ISSCR annual meeting: 20th anniversary, San Francisco (EEUU)
- 2022 EMBO Practical course: Spatial analysis of gene expression in tissues (online) (Keynote)
- 2021 The Single Cell Revolution and Precision Medicine. Hans Sigrist symposium. (online)
- 2021 8th Annual Conference: SBI2 High Content (online)
- 2021 Global health integrated organoid convening. Bill & Melinda Gates foundation. (online)
- 2021 EMBL Conference: Visualizing Biological Data (VIZBI2021) (online)
- 2021 Spatially resolved single-cell biology D-BSSE (online)
- 2021 Keystone Symposia Single Cell Biology (online)
- 2020 Annual ACR (American College of Rheumatology) Convergence meeting (online).
- 2020 Single Cell Biology Conference, Wellcome Genome Campus, Hinxton, UK (online).
- 2020 Applied Bioinformatics in Life Sciences, Leuven (Belgium)
- 2020 Single Cell Genomics Day: A Practical Workshop (Satija Lab), New York (EEUU).
- 2019 18th CRG Symposium: single cell and single molecule biology, Barcelona (Spain).
- 2019 Finnish Society for Immunology: Single Cell Immunology, Turku (Finland).
- 2019 Human Genome Meeting, Seoul (South Korea).
- 2019 Society for Reproductive Investigation, Paris (France).
- 2019 Human Genome Meeting, Seoul (South Korea).

2019 Single-Cell Symposium, Paris (France).

Selected Invited lectures (since being a group leader)

2024 Karolinska Institute (Sweden)
2024 CRG, Barcelona (Spain)
2024 IRB, Barcelona (Spain)
2024 Max Plank Institute, Berlin (Germany)
2023 CNIC (Spanish National Center for Cardiovascular Research), Madrid (Spain)
2022 Kings College, CIBCI (Centre for Inflammation Biology & Cancer Immunology), London (UK)
2022 Boston Children's Hospital lectures (online)
2022 Neurogenomics: Computational Molecular Neuroscience at MIT (online)
2022 GBSBC Seminar at USCD (San Diego, CA) (online)
2021 Biochemistry Focus ECR webinar series 2021 Early Career Research Award (online)
2021 Caltech/USC DevBio seminar series (online)
2021 Joint Oncology/Institute of Reproductive & Developmental Biology (IRDB) Seminar Series
2020 Institute for Research in Barcelona (IRB) (online)
2019 Newnham College Natural Sciences Society, Cambridge (UK)
2019 Institute for Global Health (ISGlobal), Barcelona (Spain)
2019 University College London (UCL), London (UK)
2019 Universite libre de Bruxelles, Brussels (Belgium)

SUPERVISION -

I have supervised 3 PhD students (Cambridge University): Dr. Anna Arutyunyan, Dr. Magda Mareckova, and Dr. Elias Ruiz-Morales, and 5 postdoctoral fellows: Dr. Seungjoon Kim, Dr. Hassan Massalha, Dr. Kevin Troule, Dr. Regina Hoo, and Dr. Louis-Francois Handfield. I currently supervise 5 postdoctoral fellows and 4 PhD students.

ADDITIONAL INFORMATION –

Manuscript reviewer for Nature, Nature Biotechnology, Nature Immunology, Nature Communications, Cell, Bioinformatics and Nucleic Acid Research. Member of Centre for Trophoblast Research (CTR). Grant reviewer for ERC, W. M. Keck Foundation and ETH Zurich Research. F1000 Associate Faculty Member (2016-2020).