

# CURRICULUM VITAE

## Personal Details

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## Academic milestones and relevant positions

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| 2023 – present | Invited member of the <i>International Advisory Board</i> of the <b>Institute for Experimental Medicine</b> at the Czech Academy of Sciences in Prague, Czechia   |
| 2021 – present | Associate professor equivalent position in the Division of Cell and Developmental Biology at the Center for Anatomy and Cell Biology at the <b>Medical University of Vienna, Austria</b>  |
| 2017 – 2021    | Assistant professor equivalent position in the Division of Cell and Developmental Biology at the Center for Anatomy and Cell Biology at the <b>Medical University of Vienna, Austria</b>  |
| 2012 – 2017    | Postdoctoral researcher in the laboratory of Prof. Dr. Reijo Pera, Prof. Dr. Joanna Wysocka & Prof. Dr. Vittorio Sebastiano at Institute for Stem Cell Biology & Regenerative Medicine, School of Medicine, <b>Stanford University, USA</b> |
| 2015 – 2016    | Siebel Scholar at Institute for Stem Cell Biology & Regenerative Medicine, School of Medicine, <b>Stanford University, USA</b>  |

2006 – 2011      Ph.D. student in the Genetic/Epigenetic laboratory of Prof. Dr. Jörn Walter at **University of Saarland, Germany**  
Ph.D. thesis: “Epigenetic Reprogramming of DNA Methylation in the early embryogenesis of mouse”, *Summa cum laude*

## Research / Areas of Expertise

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Keywords: Early mammalian development, Epigenetics, DNA methylation

My current research focus is to understand the embryo intrinsic epigenetic (re-)programming that underlies early cell fate decisions, and particularly the development of cellular potency. A long-term objective of my studies is to understand the impact of our environment (metabolites, aging, etc.) on epigenetic programming and translate the knowledge gained to improve the generation of higher potent cells for regenerative medicine and the treatment of epigenetically-based common human pathologies. Understanding epigenetic reprogramming *in vivo* in the early embryo will open a new era of epigenomic therapy in reproductive and regenerative medicine and will broaden the understanding of fundamental epigenetic mechanisms in developmental biology.

My track record as an independent scientist and expert in the field of epigenetics & embryology is evident from my *curriculum vitae*, which is a testament to my distinction (*summa cum laude* Ph.D. thesis, distinguished Siebel Scholar at Stanford University, group leader at the Medical University of Vienna) and productivity (multiple peer-reviewed publications in high impact journals) in an area, in which I have wholly dedicated my life's studies. The span of my work has generated fifteen publications in peer-reviewed journals (four (co-)first authorships, four (co-)corresponding authorships, and three last authorships), leading to more than 1765 citations (Scopus, April 2024). I particularly want to mention my ground-breaking publication on the discovery of the depletion of paternal DNA methylation through 5hmC by Tet-mediated enzymatic oxidation (*Nature Communications* 2011, recommended by F1000), my paper on non-coding RNAs in human embryos (*Nature Genetics* 2016), and my recent paper on the discovery of an embryo intrinsic mechanism to protect from lethal DNA damage during developmental times of high transcriptional burden (*Science Advances* 2020, co-corresponding senior author) as outstanding examples of my scientific contributions to the field. I have extensive knowledge and hands-on experience in various methods in early embryology (such as *in vitro* maturation and fertilization, microinjections, cultivation of oocytes and preimplantation embryos, and embryo transfers).

## List of 10 most important Peer-Reviewed Publications

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- Eleftheriou K, Peter A, Fedorenko I, Schmidt K, **Wossidlo M**, Arand J. A transition phase in late mouse oogenesis impacts DNA methylation of the early embryo. *Commun Biol.* 2022 Oct 2;5(1):1047. doi:

[10.1038/s42003-022-04008-1](https://doi.org/10.1038/s42003-022-04008-1).

- Arand J, Chiang HR, Martin D, Snyder MP, Sage J, Reijo Pera RA, **Wossidlo M**. Tet enzymes are essential for early embryogenesis and completion of embryonic genome activation. *EMBO Rep*. 2022 Feb 3;23(2):e53968. doi: [10.15252/embr.202153968](https://doi.org/10.15252/embr.202153968).
- Arand J, Reijo Pera RA, **Wossidlo M**. “Reprogramming of DNA methylation is linked to successful human preimplantation development.” *Histochem Cell Biol*. 2021 Jun. doi: [10.1007/s00418-021-02008-6](https://doi.org/10.1007/s00418-021-02008-6).
- Srinivasan R, Nady N, Arora N, Hsieh LJ, Swigut T, Narlikar GJ, **Wossidlo M\***, Wysocka J\*. Zscan4 binds nucleosomal microsatellite DNA and protects mouse two-cell embryos from DNA damage. *Science Advances*. 2020 Mar 20; doi: [10.1126/sciadv.aaz9115](https://doi.org/10.1126/sciadv.aaz9115). \*corresponding authors
- Manuela M, Alberto C, Reijo Pera RA, Redi CA, **Wossidlo M**. Functional topography of the fully grown human oocyte. *Eur J Histochem*. 2017 Feb 6;61:2769. doi: [10.4081/ejh.2017.2769](https://doi.org/10.4081/ejh.2017.2769).
- Durruthy-Durruthy J\*, **Wossidlo M\***, Pai S, Takahashi Y, Kang G, Omberg L, Chen B, Nakauchi H, Reijo Pera RA, Sebastiano V. Spatiotemporal Reconstruction of the Human Blastocyst by Single-Cell Gene-Expression Analysis Informs Induction of Naïve Pluripotency. *Dev Cell*. 2016 Jul 11;38(1):100-15. doi: [10.1016/j.devcel.2016.06.014](https://doi.org/10.1016/j.devcel.2016.06.014). \*co-first authors
- Grow EJ, Flynn RA, Chavez SL, Bayless NL, **Wossidlo M**, Wesche D, Martin L, Ware C, Blish C, Chang HY, Reijo Pera RA, and Wysocka J. Intrinsic retroviral reactivation in human preimplantation embryos and pluripotent cells. *Nature*. 2015 Jun 11;522(7555):221-5. doi: [10.1038/nature14308](https://doi.org/10.1038/nature14308).
- Arand J, **Wossidlo M**, Lepikhov K, Peat J, Reik W, Walter J. Selective impairment of methylation maintenance is the major cause of DNA methylation reprogramming in the early embryo. *Epigenetics & Chromatin*. 2015 Jan 9;8(1):1. doi: [10.1186/1756-8935-8-1](https://doi.org/10.1186/1756-8935-8-1).
- **Wossidlo M**, Nakamura T, Lepikhov K, Marques C.J, Zakhartchenko V, Boiani M, Arand J, Nakano T, Reik W, Walter J. 5-Hydroxymethylcytosine in the mammalian zygote is linked with epigenetic reprogramming. *Nature Commun*. 2011;2: 241. doi: [10.1038/ncomms1240](https://doi.org/10.1038/ncomms1240). *This work was awarded by the Faculty of 1000*
- **Wossidlo M\***, Arand J\*, Sebastiano V, Lepikhov K, Boiani M, Reinhardt R, Scholer H, Walter J. Dynamic link of DNA demethylation, DNA strand breaks and repair in mouse zygotes. *EMBO J*. 2010 Jun 2;29(11): 1877-88. doi: [10.1038/emboj.2010.80](https://doi.org/10.1038/emboj.2010.80). \*co-first authors

## Publications (book chapters)

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- Lepikhov K, Arand J, Fuchs S, Lan J, **Wossidlo M**, Walter J. DNA Methylation Reprogramming in Preimplantation Development. *Epigenetic Mechanisms in Cellular Reprogramming*, 2015.
- Lepikhov K, Arand J, **Wossidlo M**, Walter J. Epigenetic Reprogramming in Mammalian Development. *Encyclopedia of Molecular Cell Biology and Molecular Medicine*, 2011.
- Arand J, Lepikhov K, **Wossidlo M**, Walter J. 2010 Active DNA demethylation - the enigma starts

in the zygote. *Epigenomics: From Chromatin Biology to Therapeutics*, 2010.

### **Additional Achievements (Selection of 10)**

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- Supervisor of a Marie Skłodowska-Curie Postdoc fellowship
- Africa-UniNet grant in the 1<sup>st</sup> call of the network (P024\_Nigeria)
- Project leader FWF standalone grant (P 33984)
- Co-organizer of the regional “DevStem” meeting 2023 & 2024, Vienna, Austria
- Siebel Stem Cell Scholar at Stanford University (2015-2016)
- Selected conference talks: ARGE Epigenetics OEAWD, Vienna, Austria (2023), Second General Assembly of the Africa-UniNet, Egerton University, Kenia (2022), Annual Meeting of the Austrian Association of Molecular Life Sciences and Biotechnology (2019), Reproductive and Stem Cell Biology Symposium, Stanford University (2015 & 2016), Pacific Coast Reproductive Society Meeting, Palm Springs (2013)
- Contribution to National Geographic („*How viruses shape our world*“) (2021)
- Member of the Austrian Association of Molecular Life Sciences and Biotechnology (ÖGMBT, 2018-present), Member of the Pacific Coast Reproductive Society (PCRS, 2013-2017)
- Supervision/Mentoring of undergraduate (18), graduate students (4), postgraduate scientists (2) and one sabbatical professor (1) from 2010 - present
- Substitute teacher for natural sciences at Missione Cattolica Italiana in Germany (1998-1999)

Vienna, 10/14/2024

