

# CURRICULUM VITAE

## Personal information

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Department of Functional and Evolutionary Ecology Environmental Cell Biology group  
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**Google scholar:** <https://scholar.google.at/citations?user=zDiytb4AAAAJ&hl=en>

## Professional Experience

Since 2020 Associate Professor in Environmental Cell Biology, Department of Functional and Evolutionary Ecology, University of Vienna  
2018 – 2020 Assistant Professor, tenure track Environmental Cell Biology, Department of Functional and Evolutionary Ecology, University of Vienna  
2015 – 2019 2015 – 2019 Habilitated University Assistant and Independent PI at the Department of Ecogenomics & Systems Biology, University of Vienna  
2013 – 2019 University Assistant and independent PI at the Department of Ecogenomics & Systems Biology, University of Vienna  
2011 – 2013 Independent PI at the Laboratories of Genome Dynamics, Medical University of Vienna. Project title: Ectosymbioses of marine nematodes  
2010 – 2011 Independent PI at the Department of Ecogenomics & Systems Biology (former Department of Genetics in Ecology), University of Vienna. Project title: Ectosymbioses of marine nematodes  
2010 Three-month long research stay at the laboratory of Prof. S. Patricia Stock, Department of Entomology, University of Arizona, Tucson (US)  
2008 – 2010 Austrian Research Promotion Agency (FFG) postdoctoral fellow at the Department of Marine Biology, University of Vienna. Project title: Immunomodulatory action of a marine lectin  
2005 – 2006 Two three-month long research stays at the laboratory of Prof. R. M. Maizels, Institute of Immunology and Infection Research, University of Edinburgh (UK)  
December 2006 – March 2007 Maternity leave  
2005 – 2008 Austrian Science Fund (FWF) postdoctoral fellow at the Department of Marine Biology, University of Vienna. Project title: A stilbonematid EST project  
May – December 2005 Maternity leave  
2003 Three month-long research stay at the laboratory of Prof. Richard M. Maizels, Institute of Immunology and Infection Research, University of Edinburgh (UK)  
2002 – 2004 FWF postdoctoral fellow at the Department of Marine Biology, University of Vienna. Project title: Molecular mechanisms of partner recognition and association maintenance in marine ectosymbioses.

## Degrees

16/12/2014 Venia Docendi (“Lehrbefugnis”) in the fields of **Molecular & Cellular Biology** at the Faculty of Life Sciences, University of Vienna, AT. **Thesis title:** *Faithful, ingenious and most useful: marine nematode and flatworm symbioses*

- 15/12/2000 PhD in Genetics and Molecular Cell Biology at the Faculty of Life Sciences, University of Vienna. Thesis title: Mechanisms of asymmetric cell division in *D. melanogaster* neuroblasts: the two-hybrid screen approach. Subject: Developmental Cell Biology; Supervisor: J.A. Knoblich, Research Institute of Molecular Pathology (I.M.P.), Vienna, AT
- 23/07/1996 Graduated *cum laude* in **Biological Sciences (Molecular Biology & Biochemistry)** at the Faculty of Mathematics, Physics and Natural Sciences, Biological Sciences, University of Pisa. **Thesis title:** *Role of the XLFB3 gene in the early development of the frog X. laevis*. **Subject:** Developmental Biology; Supervisor: G. Barsacchi, Department of Physiology and Biochemistry, University of Pisa, IT

## Honours, awards and fellowships

- 2024 Elected EMBO member
- 2014 Emerging Field *Cell biology of microorganisms in their natural environment* (University of Vienna, 15 kEUR)
- 2006 – 2007 Discovery Grant Antiviral activity of His-Mermaid, PIs J. Ott & S. Bulgheresi (University of Vienna, 100 kEUR)
- 2010 – 2013 Ministry of Economy and Finance (BMWF) mobility grant for scientific-technical cooperation with the Institute of Marine Biology, Kotor (ME) PI S. Bulgheresi, 5 kEUR
- 2010 National Science Foundation (NSF) exchange visit grant to perform collaborative research in S.P. Stock's Lab (3 months), PI S. Bulgheresi, 5 kUSD

## Selected invited talks

- 2025 EMBO/FEBS Advanced course The New Microbiology, Spetses (GR)
- 2024 EMBO BacNet 24 Conference, Sant Feliu de Guíxols (ES)
- 2024 GRC *Plant & Microbial Cytoskeleton*, Andover (US)
- 2023 Lorentz workshop *Chromosome organization in Prokaryotes*, Leiden (NL)
- 2023 EMBL Symposium *The organism and its environment*, Heidelberg (DE)
- 2023 GRC *Bacterial Cell Biology and Development*, New London (US)
- 2022 Royal Dutch Society for Microbiology annual meeting, Papendal (NL) (keynote speaker)
- 2019 The Great Wall Symposium, Paris (FR) (keynote speaker)
- 2019 EMBO Workshop on *Bacterial cell division*, Lund (SE)
- 2018 GRC *Microbial Stress Response*, South Hadley (US)
- 2017 ASM General Meeting, Symposium on *Diversity in Cell Division Mechanisms*, New Orleans (US)
- 2017 ASM General Meeting, Symposium on *Diversity in Cell Division Mechanisms*, New Orleans (US)
- 2016 GRC *Plant & Microbial Cytoskeleton*, Andover (US)
- 2016 American Society of Microbiology (ASM) General Meeting, Boston (US) (plenary speaker)
- 2015 GRC *Animal-Microbe Symbiosis*, Waterville Valley Resort (US)
- 2014 Royal Netherlands Academy of Arts and Sciences Colloquium: *50 years Fts: the A-Z of bacterial cell division*, Amsterdam (NL)
- 2012 GRC *Bacterial Cell Surfaces*, Mount Snow Resort, West Dover (US)

## Research Grants

- 2024 – 2028** Austrian Science Fund (FWF) doc.funds Genome instability. Speaker C. Campbell, PI S. Bulgheresi, 200 kEUR
- 2019 – 2024** FWF doc.funds MAINTAIN Microbial symbioses in dynamic

	environments: Metabolic interplay and novel interactions. Speaker M. Horn, PI S. Bulgheresi, 200 kEUR
<b>2018 – 2020</b>	ÖAW DOC Fellowship for MS Philipp Weber, PI S. Bulgheresi, 77k EUR
<b>2016 – 2019</b>	FWF DK+ Doctoral School Microbial nitrogen cycling. Speaker C. Schleper, PI S. Bulgheresi, 200 kEUR
<b>2016 – 2019</b>	FWF Stand-alone Project Animal host control of symbiotic bacteria, PI S. Bulgheresi, 300 kEUR
<b>2015 – 2018</b>	FWF Stand-alone Project Growth and septation of animal-attached bacteria, PI S. Bulgheresi, 300 kEUR
<b>2010 – 2013</b>	FWF Stand-alone Project Marine nematode ectosymbioses, PI S. Bulgheresi, 400 kEUR

## Esteem factors

Co-organizer of the European Nematode Society (ESN) meeting 2010

Editor for: ASM Spectrum, Frontiers in Microbiology

Reviewer activity for the following scientific journals: The Biological Bulletin, Current Biology, Ecology Letters, Environmental Microbiology, Environmental Microbiology Reports, mBio, mSystems, PLoS One, Proceedings of the National Academy of Sciences (PNAS), The ISME Journal

Reviewer activity for the following research funding agencies: Agence Nationale de la Recherche (ANS, France), National Science Foundation (NSF, US), National Foundation for Science Higher Education and Technological Development of the Republic of Croatia (NZZ, HR), Czech Republic Funding agency (GAČR, CZ)

## Past and current cooperation partners (in chronological order)

**Richard M. Maizels** (University of Edinburgh, UK)

**Mark Blaxter** (University of Edinburgh, UK)

**Johnatan Ewbank** (Centre d' Immunologie de Marseille-Luminy, FR) **Tie**

**Chen** (Hubei University of Science and Technology, CN) **Nemani V.**

**Prasadarao** (Los Angeles Children's Hospital, US) **Teunis Geijtenbeek**

(University of Amsterdam, NL)

**Tanneke den Blaauwen** (University of Amsterdam, NL)

**Paul Sternberg** (Caltech, US)

**S. Patricia Stock** (University of Arizona, US)

**Lawrence Rothfield** (University of Connecticut Health Center, US)

**Piet de Boer** (Case Western Reserve University, US)

**Yves Brun** (University of Montreal, CA)

**Cees Dekker** (TU Delft, NL)

**Felipe Cava** (Umea University, SE)

**Simonetta Gribaldo** (Institut Pasteur, FR) **Stephanie**

**Markert** (University of Greifswald, DE) **Raymond Lee**

(Washington State University, US) **Michael Wagner**

(University of Vienna, AT)

**Thomas Pradeu** (CNRS & University of Bordeaux, FR)

**Damien Devos** (University of Sevilla, ES) **Michael**

**Wagner** (University of Vienna, AT) **David Berry**

(University of Vienna, AT) **Frederic Veyrier** (INRSA

## FULL LIST OF PUBLICATIONS

### Peer reviewed publications 2226 total citations, 20 h-index (Google Scholar);

\* indicates equally contributing authors

1. **Bulgheresi S.**, Kleiner E., Knoblich J.A. Inscuteable dependent apical localization of the microtubule-binding protein Cornetto suggests a role in asymmetric cell division. 2001. **Journal of Cell Science**. 114:3655-62.
2. Ott J.A., Bright M., **Bulgheresi, S.** Marine Microbial Thiotrophic Ectosymbioses. 2004. **Oceanography & Marine Biology, an Annual Review** 42:95-118.
3. Ott J.A., Bright M., **Bulgheresi S.** Symbioses between marine nematodes and sulfur-oxidizing chemoautotrophic bacteria. 2004. **Symbiosis** 36:103-126.
4. **Bulgheresi S.**, Schabussova I., Chen T., Mullin N. P., Maizels R. M., Ott J.A. A new C-type lectin similar to the human immunoreceptor DC-SIGN mediates symbiont acquisition by a marine nematode. 2006. **Applied and Environmental Microbiology**. 72:2950-2956.
  - First report of the functional role of a conserved, key innate immune effector in microbial symbiosis maintenance
5. Zhang P., Snyder S., Feng P., Azadi P., Zhang S., **Bulgheresi S.**, Sanderson K., He J.J., Klena J.D., Chen T. Role of N-Acetylglucosamine within Core Lipopolysaccharide of Several Species of Gram-negative Bacteria in Targeting the DC-SIGN (CD209). 2006. **Journal of Immunology**. 177(6):4002-4011.
6. Zhang P., Skurnik M., Zhang S., Schwartz O., Kalyanasundaram R., **Bulgheresi S.**, He J.J., Klena J.D., B. Hinnebusch J., Chen T. Human DC-SIGN (CD209) is a receptor for *Yersinia pestis* that promotes phagocytosis by dendritic cells. 2008. **Infection and Immunity**. 76(5):2070-9.
7. Nabatov A.A., de Jong M.A.W.P., de Witte L., **Bulgheresi S.\***, Geijtenbeek T.H.B.\* C-type lectin Mermaid inhibits dendritic cell mediated HIV-1 transmission to CD4+ T cell. 2008. **Virology**. 378(2):323-8.
8. Bayer C., Heindl R.N., Rinke C., Lücker S., Ott, J.A., **Bulgheresi S.** Molecular characterization of the symbionts associated with marine nematodes of the genus *Robbea*. 2009. **Environmental Microbiology Rep.** 1(2):136-144.
9. Mittal R., **Bulgheresi S.**, Emami C., Prasadarao N.V. *Enterobacter sakazakii* targets DC-SIGN to induce immunosuppressive responses in dendritic cells by modulating MAP kinases. 2009. **Journal of Immunology**. 183(10):6588-99.
10. Bright M., **Bulgheresi S.** Microbial symbiont transmission. 2010. **Nature Reviews Microbiology**. 8(3):218-30.
  - Overview of the molecular mechanisms that mediate symbiont attraction and accumulation, inter-partner recognition and selection, as well as symbiont confrontation with the host immune system
11. **Bulgheresi S.**, Gruber-Vodicka H.R., Heindl N.R., Dirks U., Kostadinova M., Breiteneder H., Ott J.A. Sequence variability of the pattern recognition receptor Mermaid

mediates specificity of marine nematode symbioses. 2011. **The ISME Journal**. 5(6):986-98.

12. Heindl N.R., Gruber-Vodicka H.R., Bayer C., Luecker S., Ott J.A., **Bulgheresi S.** First detection of thiotrophic symbiont phylotypes in the pelagic environment. 2011. **FEMS Microbiology Ecology**. 77(1):223-7.

13. Gruber-Vodicka H., Dirks U., Leisch N., Baranyi C., Stoecker K., **Bulgheresi S.**, Niels R. Heindl, Horn M., Lott C., Loy A., Wagner M., Ott J.A. *Paracatenula*: an ancient symbiosis between Thiotrophic *Alphaproteobacteria* and catenulid flatworms. 2011. **Proceedings of the National Academy of Sciences US**. 108(29):12078-83.

14. **Bulgheresi S.** Calling the roll on *Laxus oneistus* immune defense molecules. 2011. **Symbiosis** 55:127-135.

15. Dirks U., Gruber-Vodicka H.R., Leisch N., **Bulgheresi S.**, Egger B., Ladurner P., Ott J.A. Bacterial Symbiosis Maintenance in the Asexually Reproducing and Regenerating Flatworm *Paracatenula galateia*. 2012. **PLoS ONE** 7(4): e34709.

16. Murfin K.E., Dillman A.R., Foster J.M., **Bulgheresi S.**, Slatko B.E., Sternberg P.W., Goodrich-Blair H. Nematode-Bacterium Symbioses - Cooperation and Conflict Revealed in the 'Omics' Age. 2012. **The Biological Bulletin** 223(1):85-102.

17. Leisch N., Verheul J., Heindl N.R., Gruber-Vodicka H.R., Pende N., den Blaauwen T., **Bulgheresi S.** Growth in width and FtsZ ring longitudinal positioning in a gammaproteobacterial symbiont. 2012. **Current Biology**. 22(19):831-32.

• First report of FtsZ-based longitudinal binary fission in a rod-shaped bacterium  
[http://www.cell.com/current-biology/pdf/S0960-9822\(12\)00998-0.pdf](http://www.cell.com/current-biology/pdf/S0960-9822(12)00998-0.pdf)

18. Pende N., Leisch N., Gruber-Vodicka H.R., Heindl N.R., Ott, A.J., den Blaauwen, T., **Bulgheresi S.** Size-independent division in extraordinary long polyploid cells. 2014. *Nature Communications*. 5:4803.

19. Yang K., Gyu Park C., Cheong C., **Bulgheresi S. et al.** Host Langerin (CD207) is a receptor for *Yersinia pestis* phagocytosis and promotes dissemination. 2015. **Immunology & Cell Biology**. 93(9):815-24.

• In a gammaproteobacterial symbiont symmetric binary fission occurs in 120 µl-long cells and in a second one fission occurs at virtually every size between 4 and 45 µm  
<https://www.nature.com/articles/ncomms5803.pdf>

20. **Bulgheresi S.** All the microbiology nematodes can teach us. 2016. **FEMS Microbiology Ecology**. 94(1): fix170.

21. **Bulgheresi S.** Bacterial cell biology outside the streetlight. 2016. **Environmental Microbiology**. 18(8):2305-18.

22. Leisch N., Pende N., Weber M.P., Gruber-Vodicka R.H., Verheul J., Vischer N.O.E., Abby S., den Blaauwen T., Bulgheresi S.. Asynchronous division by non-ring FtsZ in the gammaproteobacterial symbiont of *Robbea hypermnestra*. 2016. *Nature Microbiology*. 2:16182.

i. The FtsZ ring is dispensable in the first bacterium reported to divide by asynchronous longitudinal fission  
<https://www.nature.com/articles/nmicrobiol2016182.pdf>

23. Petersen J.M., Kemper A., Gruber-Vodicka R.H., Cardini U., van der Geest M., **Bulgheresi S.**, Mußmann M., Seah K.B.B., Chakkiath P.A., Herbold C., Belitz A., Miriam W. Chemosynthetic sulphur-oxidizing symbionts of marine invertebrate animals are capable of nitrogen fixation. 2016. **Nature Microbiology**. 2:16195.

24. Pende N., Wang J., Weber P.M., Verheul J., Kuru E., Rittmann S.K.-M.R., Leisch

N., Michael S. VanNieuwenhze M., Brun Y.V., den Blaauwen T., Bulgheresi S. Host-polarized cell growth in animal symbionts. 2018. *Current Biology*. 28:1-13.

- The actin homolog MreB is required for both septal growth and longitudinal fission in two gammaproteobacterial symbionts.

25. Yang K., He Y., Park C.G., Zhang P., Han Y., Cui Y., **Bulgheresi S.** *et al.* *Yersinia pestis* interacts With SIGNR1 (CD209b) for promoting host dissemination and infection. 2019. **Front Immunol**. 10: 96.

26. Weber P.M., Moessel F., Paredes G.F., Viehboeck T., Vischer N.O.E., **Bulgheresi S.** A bidimensional segregation mode maintains symbiont chromosome orientation toward its host. 2019. *Current Biology*. 29:1-11. IF=9.2

- First study of DNA segregation in an animal symbiont reveals ParB-mediated transgenerational maintenance of chromosome configuration.

27. Wang J., Alvarez L., **Bulgheresi S.**, Cava F., den Blaauwen T. PBP4 is likely involved in cell division of the longitudinally dividing bacterium *Candidatus Thiosymbion oneisti*. 2021. **Antibiotics**. 10(3): 274.

28. Paredes G.F., Viehboeck T., Raymond L., Palatinszky M., Mausz M., Reipert S., Schintlmeister A., Volland J.M., Hirschfeld C., Wagner M., Berry D., Markert S., **Bulgheresi S.**, König L. Anaerobic sulfur oxidation underlies adaptation of a chemosynthetic symbiont to oxic-anoxic interfaces. 2021. **mSystems**. 6(3): e01186-20.

29. Weber P.M., Paredes G.F., Viehböck T., Pende N., Volland J.M., J.A. Ott, Gros O., **Bulgheresi S.** 2022. FtsZ-mediated fission of a cuboid bacterial symbiont. 2021. **iScience** 25.1.

30. Wang, J., **Bulgheresi, S.**, & den Blaauwen, T. (2022). The Longitudinal Dividing Bacterium *Candidatus Thiosymbion Oneisti* Has a Natural Temperature-Sensitive FtsZ Protein with Low GTPase Activity. *International Journal of Molecular Sciences*, 23(6), 3016.

31. Paredes, G. F., Viehboeck, T., Markert, S., Mausz, M. A., Sato, Y., Liebeke, M., ... & **Bulgheresi, S.** (2022). Differential regulation of degradation and immune pathways underlies adaptation of the ectosymbiotic nematode *Laxus oneistus* to oxic-anoxic interfaces. *Scientific Reports*, 12(1), 9725.

32. Nyongesa, S., Weber, P. M., Bernet, È., Pulido, F., Nieves, C., Nieckarz, M., Delaby M., Viehböck T., Krause N., Rivera-Millot A., Nakamura A., Vischer N.O.E., van Nieuwenhze M., Brun Y.V., Cava F., **Bulgheresi S.**, Veyrier, F. J. (2022). Evolution of longitudinal division in multicellular bacteria of the Neisseriaceae family. *Nature Communications*, 13(1), 4853.

33. Ott, J., **Bulgheresi, S.**, Gruber-Vodicka, H., Gruhl, A., König, L., & Leisch, N. (2023). Meiofauna Meets Microbes—Chemosynthetic Symbioses. In *New Horizons in Meiobenthos Research: Profiles, Patterns and Potentials* (pp. 79-119). Cham: Springer International Publishing.

34. Dudek, N. K., Galaz-Montoya, J. G., Shi, H., Mayer, M., Danita, C., Celis, A. I., Viehböck T., Wu G.-H., Behr B., Bulgheresi S., Huang K.C., Chiu W., Relman, D. A. (2023). Previously uncharacterized rectangular bacterial structures in the dolphin mouth. *Nature Communications*, 14(1), 2098.

35. Viehboeck, T., Weber, P. M., Krause, N., Varoquaux, N., Boccard, F., Junier, I., **Bulgheresi S.**, Liou, V. S. (2023). Stable chromosome configuration and loop-based polarization in animal symbionts. *bioRxiv*, 2023-12.

## Books

**Bulgheresi S.** Brave genomes, microbial genome plasticity in the face of environmental change, 1st Edition, Elsevier/Academic Press (available from January 2025).

<https://www.amazon.com/Brave-Genomes-Environmental-Biochemistry-Biotechnology/dp/0443187894>

## Book Chapters

**Bulgheresi S.** Microbial symbiont transmission: basic principles and dark sides. 2011. In *Beneficial Microorganisms in Multicellular Life Forms*, E. Rosenberg/U. Gophna (eds), Springer-Verlag, p.299-311.

Ott J.A., **Bulgheresi S.** *et al.* Chemosynthetic symbioses in meiofauna (in preparation) In *Meiofauna as a link between the micro- and macroworld*, O. Giere/J.A. Ott (eds), Springer-Verlag (in preparation).

## Scientific book review

**Bulgheresi S.** I, microbe. 2016. *Nature Microbiology*. 1(8):16117.

## Patents

Universität Wien: **Bulgheresi S.**, Ott J. Pharmaceutical preparation for the prevention of infections. *WO2007109821 (2007) 34 pages*

## ACADEMIC TEACHING AND SUPERVISION

### Teaching activity at the University of Vienna

#### For Bachelor students

**Practical course:** *Extremophilic and Thiotrophic Microorganisms from Volcanic Environments*

**Lecture series:** *Microbial genome plasticity*

#### For Master and PhD students

Practical courses:

*Molecular Microbiology, Microbial Ecology and Immunobiology Marine Microbial Symbioses (2016-2017)*

Seminars:

*Symbiosis - Concepts and Model Systems*

*Advanced topics in Molecular Biology and Physiology of Bacteria and Archaea Literature seminars on Biodiversity and Ecosystems*

Lectures:

*Molecular mechanisms of Symbiosis Symbiosis -*

*Concepts and Model Systems I Symbiosis - Concepts*

*and Model Systems II Biology and Evolution of Archaea*

*Environmental Cell Biology*

## **Teaching activity outside the University of Vienna**

Ad hoc invited lecturer for the **ERC Training Network BluePharmTrain** Workshop, Tallinn (EE), October 2015, 8 hr total. Host: D. Sipkema, Wageningen University, NL

Ad hoc Invited lecturer at **Immunoconcept - immunology from concept and experiments to translation**, University of Bordeaux (FR), March 2017. Host: T. Pradeu, University of Bordeaux (FR)