

## Dr. Astrid Collingro

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### Main research interests

Diversity and evolution of *Chlamydiae*  
Microbial genomics and genome evolution  
Molecular biology of chlamydiae and their interaction with eukaryotic host cells  
Ecology of chlamydiae and their host organisms  
Bacterial symbionts of protozoa

### Education and positions held

since 10/2012	<b>Research scientist</b> at the Division of Microbial Ecology, CMESS, University of Vienna, Austria
03/2011 - 09/2012	<b>Maternity leave</b>
01/2009 - 02/2011	<b>Research scientist</b> at the Division of Microbial Ecology, CMESS, University of Vienna, Austria
01/2009 - 04/2009	<b>Postdoctoral researcher</b> at the Division of Microbial Ecology, CMESS, University of Vienna, Austria
07/2007 - 12/2008	<b>Maternity leave</b>
10/2006 - 06/2007	<b>Research scientist</b> at the Division of Microbial Ecology, CMESS, University of Vienna, Austria
04/2005 - 09/2006	<b>Maternity leave</b>
10/2004 - 03/2005	<b>Postdoctoral researcher</b> at the Division of Microbial Ecology, CMESS, University of Vienna, Austria
01/2002 - 08/2004	<b>PhD student</b> , Division of Microbial Ecology, CMESS, University of Vienna, Austria and Department of Microbiology, Technical University of Munich, Germany
10/1996 - 01/2002	<b>Diploma student</b> , Department of Microbiology, Technical University of Munich, Germany

### Additional training

Workshop on Molecular Evolution 2018, Molecular Biology Laboratory, Woods Hole, MA, USA  
"R" - advanced, 2017, University of Vienna, Vienna, Austria  
Introduction to "R", 2015, University of Vienna, Vienna, Austria

### Third-party funding

Project grant: *Towards functional ecology of environmental chlamydiae* (PI). Funded by the Austrian Science Fund (FWF – Der Wissenschaftsfonds), stand-alone project number P 32112, 2020-2023

### Research stays

Australian Institute of Marine Science, Townsville, QLD, Australia (July-December 2019)

### Professional memberships

American Society for Microbiology (ASM), USA  
Chlamydia Basic Research Society (CBRS), USA

### Ad-hoc review activities

Microbial Ecology

### Teaching experience

Co-supervision of laboratory work and thesis of Master (2) and PhD (1) students.

### Publications

- Ghasemian E, Inic-Kanada A, **Collingro A**, Tagini F, Stein E, Alchalabi H, Schuerer N, Keše D, Babiker BE, Borel N, Greub G, Barisani-Asenbauer T. Detection of Chlamydiaceae and Chlamydia-like organisms on the ocular surface of children and adults from a trachoma-endemic region. *Sci Rep* (2018) 8(1):7432. doi: 10.1038/s41598-018-23887-1.
- Collingro A**, Köstlbacher S, Mussmann M, Stepanauskas R, Hallam SJ, Horn M. Unexpected genomic features in widespread intracellular bacteria: evidence for motility of marine chlamydiae. *ISME J* (2017) 11(10):2334-2344. doi: 10.1038/ismej.2017.95.
- Collingro A**, Kostanjšek R, Toenshoff ER, Schulz F, Schuster L, Domann D, Horn M. Draft Genome Sequence of "Candidatus Hepatoplasma crinochetorum" Ps, a Bacterial Symbiont in the Hepatopancreas of the Terrestrial Isopod *Porcellio scaber*. *Genome Announc* (2015) 13:3(4) pii: e00674-15. doi: 10.1128/genomeA.00674-15.
- Domman D, **Collingro A**, Lagkouvardos I, Gehre L, Weinmaier T, Rattei T, Subtil A, Horn M. Massive Expansion of Ubiquitination-Related Gene Families within the Chlamydiae. (2014) *Mol Biol Evol*. 31:2890-904. doi: 10.1093/molbev/msu227.
- Subtil A, **Collingro A**, Horn M. Tracing the primordial Chlamydiae: extinct parasites of plants? (2014) *Trends Plant Sci* 19: 36-43. doi: 10.1016/j.tplants.2013.10.005.
- Toenshoff ER, Penz T, Narzt T, **Collingro A**, Schmitz-Esser S, Pfeiffer S, Klepal W, Wagner M, Weinmaier T, Rattei T, Horn M. Bacteriocyte-associated gammaproteobacterial symbionts of the *Adelges nordmannianae/piceae* complex (Hemiptera: Adelgidae). (2012) *ISME J* 6(2):384-96. doi: 10.1038/ismej.2011.102.
- Collingro A**, Tischler P, Weinmaier T, Penz T, Heinz E, Brunham RC, Read TD, Bavoil PM, Sachse K, Kahane S, Friedman MG, Rattei T, Myers GSA, Horn M. Unity in variety - the pan-genome of the Chlamydiae. (2011) *Mol Biol Evol* 28: 3253-3270. doi: 10.1093/molbev/msr161.
- Haider S, **Collingro A**, Walochnik J, Wagner M, Horn M. Chlamydia-like bacteria in respiratory samples of community-acquired pneumonia patients. (2008) *FEMS Microbiol Lett* 281: 198-202. doi: 10.1111/j.1574-6968.2008.01099.x.
- Strous M, Pelletier E, Mangenot S, Rattei T, Lehner A, Taylor MW, Horn M, Daims H, Bartol-Mave D, Wincker P, Barbe V, Fonknechten N, Vallenet D, Segurens B, Schenowitz-

- Truong C, Médigue C, **Collingro A**, Snel B, Dutilh BE, Op den Camp HJM, van der Drift C, Cirpus I, van de Pas-Schoonen KT, Harhangi HR, van Niftrik L, Schmid M, Keltjens J, van de Vossenberg J, Kartal B, Meier H, Frishman D, Huynen MA, Mewes HW, Weissenbach J, Jetten MSM, Wagner M, Le Paslier D. Deciphering the evolution and metabolism of an anammox bacterium from a community genome. (2006) *Nature* 440: 790-794. doi:10.1038/nature04647.
- Collingro A**, Toenshoff ER, Taylor MW, Fritsche TR, Wagner M, Horn M. 'Candidatus Protochlamydia amoebophila', an endosymbiont of *Acanthamoeba* spp. (2005) *Int J Syst Evol Microbiol* 55:1863-6. doi: 10.1099/ijs.0.63572-0
- Collingro A**, Poppert S, Heinz E, Schmitz-Esser S, Essig A, Schweikert M, Wagner M, Horn M. Recovery of an environmental chlamydia strain from activated sludge by co-cultivation with *Acanthamoeba* sp. (2005) *Microbiology* 151: 301-309. doi: 10.1099/mic.0.27406-0.
- Haferkamp I, Schmitz-Esser S, Linka N, Urbany C, **Collingro A**, Wagner M, Horn M, Neuhaus HE. A candidate NAD<sup>+</sup> transporter in an intracellular bacterial symbiont related to chlamydiae. (2004) *Nature* 432: 622-625. doi:10.1038/nature03131.
- Horn M, **Collingro A**, Schmitz-Esser S, Beier CL, Purkhold U, Fartmann B, Brandt P, Nyakatura GJ, Droege M, Frishman D, Rattei T, Mewes HW, Wagner M. Illuminating the evolutionary history of chlamydiae. (2004) *Science* 304: 728-730. doi: 10.1126/science.1096330.
- Schmitz-Esser S, Linka N, **Collingro A**, Beier CL, Neuhaus HE, Wagner M, Horn M. ATP/ADP translocases: A common feature of obligate intracellular amoebal symbionts related to chlamydiae and rickettsiae. (2004) *J Bacteriol* 186: 683691. doi: 10.1128/JB.186.3.683-691.2004.

### Book chapters and other publications

- Horn M, **Collingro A**, Schmitz-Esser S, Wagner M (2006). Environmental chlamydia genomics. In *Chlamydia: genomics and pathogenesis*, pp. 25-44. (Bavoil PM, Wyrick PB, ed.). Horizon Scientific Press, Norfolk.
- Collingro A**, Horn M (2005). Chlamydien als Symbionten frei lebender Amöben. *Biospektrum* 4: 393-394.
- Collingro A**, Horn M, Wagner M (2004). Die Evolution der Chlamydien - Einblicke in die Entwicklungsgeschichte bedeutender bakterieller Krankheitserreger aus einer genomischen Perspektive. *GenomXPress* 2, 13-14.

### Contributions to international conferences

- Köstlbacher S, Pjevac P, Orlić S, Halter T, Schulz F, Jungbluth J, Eloe-Fadrosh E, Woyke T, Horn M, **Collingro A** (June 2019). Chlamydial symbionts in nature – who is out there? Gordon Research Conference on Animal-Microbe Symbioses, Mount Snow, VT, USA (*poster presentation*).
- Collingro A**, Pjevac P, Köstlbacher S, Orlić S, Miko S, Horn M (March 2019). Chlamydiae in the wild: composition of natural chlamydial communities in a freshwater lake. Meeting of the Chlamydia Basic Research Society (CBRS), Seattle, WA, USA (*poster presentation*).
- Collingro A**, Köstlbacher S, Mußmann M, Hallam SJ, Stepanauskas R, Horn M (May 2017). Marine chlamydiae are motile - evidence from single cell genomes. Meeting of the Planctomycetes-Verrucomicrobia-Chlamydiae superphylum community, Porto, Portugal (*oral presentation*).
- Collingro A**, Köstlbacher S, Mußmann M, Hallam SJ, Stepanauskas R, Horn M (April 2017). Marine chlamydiae are motile - evidence from single cell genomes. Meeting of the Chlamydia Basic Research Society (CBRS), Charlotte, NC, USA (*oral presentation*).
- Collingro A**, Köstlbacher S, Mußmann M, Hallam SJ, Stepanauskas R, Horn M (September 2016). Marine chlamydiae are motile - evidence from single cell genomes. Meeting of the

- European Society of Chlamydia Research (ESCR), Oxford, Great Britain (*oral presentation*).
- Collingro A**, Domman D, Siegl A, Sixt B, Toenshoff ER, Kostanjšek R, Horn M (March 2015). Evolution of chlamydial plasmids: a single large plasmid in the beginning? Meeting of the Chlamydia Basic Research Society (CBRS), New Orleans, LA, USA (*poster presentation*).
- Collingro A**, Heinz E, Tischler P, Wagner M, Rattei T, Myers G, Horn M (March 2007). Genomics of environmental counterparts of the *Chlamydiaceae*: an update. Meeting of the Chlamydia Basic Research Society (CBRS), Louisville, KY, USA (*oral presentation*).
- Toenshoff ER, Narzt T, **Collingro A**, Schmitz-Esser S, Klepal W, Wagner M, Horn M (September 2005). The silver fir woolly aphid *Dreyfusia nordmanniana* (Adelgidae) contains novel gammaproteobacterial endosymbionts. Joint Annual Conference of the German Society for Hygiene and Microbiology (DGHM) and the Association for General and Applied Microbiology (VAAM), Göttingen, Germany (*poster presentation*).
- Haider S, Schmitz-Esser S, **Collingro A**, Wagner M, Horn M (September 2004). Heat shock proteins (GroEL) of the environmental chlamydia UWE25. Meeting of the European Society for Chlamydia Research (ESCR), Budapest, Hungary (*poster presentation*).
- Schmitz-Esser S, Haferkamp I, Linka N, **Collingro A**, Urbany C, Wagner M, Neuhaus HE, Horn M (September 2004). Characterization of nucleotide transport proteins of the environmental chlamydia UWE25. Meeting of the European Society for Chlamydia Research (ESCR), Budapest, Hungary (*poster presentation*).
- Heinz E, Schmitz-Esser S, **Collingro A**, Wagner M, Horn M (September 2004). Characterization of the cell envelope of the environmental chlamydia UWE25. Meeting of the European Society for Chlamydia Research (ESCR), Budapest, Hungary (*poster presentation*).
- Collingro A**, Rattei T, Schmitz-Esser S, Frishman D, Mewes H-W, Wagner M, Horn M (September 2004). Biology of environmental chlamydiae revealed by comparative genome analysis. Meeting of the European Society for Chlamydia Research (ESCR), Budapest, Hungary (*poster presentation*).
- Collingro A**, Horn M, Schmitz-Esser S, Beier C, Purkhold U, Fartmann B, Brandt P, Nyakatura GJ, Droege M, Frishman D, Rattei T, Mewes H-W, Wagner M (May 2004). The genome sequence of a chlamydial symbiont of free-living amoebae. Bioperspectives, Wiesbaden, Germany (*poster presentation*).
- Schmitz-Esser S, **Collingro A**, Haider S, Heinz E, Schweinitzer T, Hönninger V, Toenshoff E, Horn M, Wagner M (March 2004). Molecular mechanisms of interaction between chlamydia-related symbionts and their amoebal hosts. Minisymposium on Microbial Ecology, Vienna, Austria (*poster presentation*).
- Collingro A**, Horn M, Schmitz-Esser S, Beier C, Purkhold U, Fartmann B, Brandt P, Nyakatura GJ, Droege M, Frishman D, Rattei T, Mewes H-W, Wagner M (March 2004). The genome sequence of a chlamydial symbiont of free-living amoebae. Minisymposium on Microbial Ecology, Vienna, Austria (*poster presentation*).
- Haider S, Schmitz-Esser S, **Collingro A**, Wagner M, Horn M (March 2004). Heat shock proteins (GroEL) in environmental chlamydiae. 2nd German Chlamydia Workshop, Berlin, Germany (*poster presentation*).
- Horn M, **Collingro A**, Schmitz-Esser S, Beier C, Purkhold U, Wagner M (March 2004). The genome sequence of a chlamydia-related symbiont of free-living amoebae and its use for reconstructing the evolutionary history of major human pathogens. 2nd German Chlamydia Workshop, Berlin, Germany (*oral presentation*).
- Horn M, **Collingro A**, Schmitz-Esser S, Purkhold U, Beier C, Schleifer K-H, Fartmann B, Brandt P, Nyakatura GJ, Droege M, Frishman G, Montrone C, Frishman D, Rattei T, Mewes, H-W, Wagner M (October 2003). The environmental chlamydiae genome project.

- European Conference on Prokaryotic Genomes, Göttingen, Germany (*poster presentation*).
- Schmitz-Esser S, **Collingro A**, Wagner M, Heuer D, Ziska E, Szczepek AJ, Meyer TFM, Horn M (September 2003). Characterization of potential virulence genes in the environmental chlamydia isolate UWE25. Annual meeting of the German Society for Hygiene and Microbiology (DGHM), Dresden, Germany (*poster presentation*).
- Collingro A**, Horn M, Schmitz-Esser S, Beier C, Purkhold U, Fartmann B, Brandt P, Nyakatura GJ, Droege M, Frishman D, Frishman G, Montrone C, Rattei T, Mewes HW, Wagner M (September 2003). The environmental chlamydia genome project – Insights into the genome of a putative new emerging pathogen. Annual meeting of the German Society for Hygiene and Microbiology (DGHM), Dresden, Germany (*oral presentation*).
- Collingro A**, Schmitz-Esser S, Beier C, Linka N, Neuhaus HE, Essig A, Marre R, Poppert S, Wagner M, Horn M (March 2003). Interactions of environmental chlamydiae with eukaryotic cells: host range, energy metabolism, and virulence. Meeting of the Chlamydia Basic Research Society (CBRS), Memphis, TN, USA (*poster presentation*).
- Horn M, **Collingro A**, Schmitz-Esser S, Beier C, Purkhold U, Wagner M (March 2003). The Environmental Chlamydiae Genome Project. 1st German Chlamydia Workshop, Berlin, Germany (*oral presentation*).
- Beier C, Horn M, **Collingro A**, Schmitz-Esser S, Fartmann B, Brandt P, Nyakatura GJ, Droege M (October 2002). EDGE – The environmental chlamydiae genome project. Gegenwart und Zukunft der bakteriellen Genomforschung in Deutschland, Bielefeld, Germany (*poster presentation*).
- Collingro A**, Poppert S, Beier C, Schmitz-Esser S, Essig A, Marre R, Horn M, Wagner M (September 2002). Chlamydia-related obligate endosymbionts of environmental acanthamoeba isolates infect mammalian cells. Jahrestagung der Deutschen Gesellschaft für Hygiene und Mikrobiologie (DGHM), Heidelberg, Germany (*poster presentation*).
- Collingro A**, Walcher M, Wagner M (May 2002). Interactions between *Acanthamoeba* spp. and *Listeria monocytogenes*. International meeting on Novel Techniques In Microbial Ecology (INTIME), Blokhus, Denmark (*oral presentation*).
- Collingro A**, Walcher M, Schweikert M, Horn M, Wagner M (March 2002). Influence of temperature and bacterial endosymbionts on the multiplication of *L. monocytogenes* within acanthamoebae. Annual Conference of the Association for General and Applied Microbiology (VAAM), Göttingen, Germany (*poster presentation*).