

Dr. Olivia Roth, Curriculum vitae

Address	GEOMAR Helmholtz Centre for Ocean Research Kiel Düsternbrookerweg 20, 24105 Kiel, Germany
Date of birth	15 January 1983
Nationality	Swiss (CH)
Email	oroth@geomar.de
Telephone (office)	++49 431 600 4557
Homepage	http://www.geomar.de/en/mitarbeiter/fb3/ev/oroth/

Research Experience

06/12 – present	Leader of a Junior Group at the GEOMAR Kiel (D)
04/09 – 05/12	Postdoc at the GEOMAR Kiel (D) in the group of Prof. Thorsten Reusch

Education

05/06 – 03/09	<i>“Evolutionary Ecology of Specificity in Invertebrate Immune Defence”</i> PhD Thesis at the ETH Zürich (CH) and the University of Münster (D), Supervisors: Prof. Paul Schmid-Hempel & Prof. Joachim Kurtz
10/04 – 04/06	<i>“Male-biased sex-ratio distortion in a host-parasite system with horizontal - and vertical transmission (Daphnia magna & Octospora bayeri)”</i> Master thesis at the University of Basel, Supervisor: Prof. Dieter Ebert
10/01 – 08/04	Bachelor of Science in Organismic Biology, University of Basel (CH)
08/95 - 09/01	Matura at the Kantonsschule am Burggraben, St.Gallen (CH)

Grants & Funding received

04/13	Funding for the conference <i>“the Vast World (VW) of Evolution”</i> from the Volkswagen foundation (43'000 €) (PI: Olivia Roth, Co-PI: Astrid Böhne)
03/13	Future Ocean Excellence Cluster grant <i>“Emerging marine disease: Why to shift from friendly to nasty”</i> (75'000 €) (PI: Olivia Roth, Co-PI: Hinrich Schulenburg)
01/13	DFG grant <i>“Trans-generational immune priming & sexual immune dimorphism across a parental care gradient in two fish families”</i> (179'800 €) (PI: Olivia Roth, Co-PI: Walter Salzburger)
12/12	Funding for symposium <i>“non-genetic transfer of immunity across generations”</i> at ESEB 2013 from the Volkswagen foundation (5'000 €)
04/12	Advanced Postdoc grant from the Volkswagen foundation (276'300 €): <i>“Manipulation of bacteria – fish interactions by marine viruses – an evolutionary analysis”</i>
03/12	Grant from the ministry for science, economy and traffic (745'714 €) for project <i>“FINE-AQUA”</i> (PI: Thorsten Reusch, Catriona Clemmesen, Co-PI: Olivia Roth)
01/11	Funding for the conference <i>“Evolution at the Sea”</i> from the Volkswagen foundation (100'000€) (PI: Thorsten Reusch, Hinrich Schulenburg, Olivia Roth)
04/10	PhD grant for Susanne Landis from the Volkswagen foundation (190'000 €): <i>“The effect of global change on host-parasite interactions and coevolution of the deep-snouted pipefish (Syngnathus typhle) and its parasite (Cryptocotyle lingua)”</i> (PI: Thorsten Reusch, Olivia Roth; PhD student: Susanne Landis)

12/09	Supplementary grant from the Volkswagen foundation for <i>Syngnathus typhle</i> EST library (20'000 €)
04/09	Postdoc grant from the Volkswagen foundation (241'500 €): " <i>Evolutionary costs and benefits of trans-generational immune priming in a sex-role reversed fish</i> "
03/09	Prospective Researcher Grant from the Swiss National Science Foundation (41'000 CHF) (awarded not accepted)
12/08	Future Ocean Excellence Cluster grant (50'000 €) (PI: Thorsten Reusch, Co-PI: Olivia Roth)

Research Supervision

PhD students:

Susanne Landis, GEOMAR 08/2009 – present: „*The effect of global change on host-parasite interactions and coevolution of the broad-nosed pipefish (Syngnathus typhle) and its parasites*“

Anne Beemelmans, GEOMAR, 01/2012 – present: „*The mechanistic basis of paternal immune priming in the pipefish Syngnathus typhle*“

Andrea Franke, GEOMAR, 06/2012 – present: "*Probiotics and immunostimulants as boosts of larval immune defence in aquaculture*"

Isabel Keller, GEOMAR, 01/2013 – present: "*Trans-generational immune priming on a parental care gradient*"

Caterina Schlott, GEOMAR, 05/2013: "*The strength of parental care predicts sexual immune dimorphism*"

Master students:

João Vicente de Camargo e Silva Gladek, 11/2012 – present: "*Trans-generational immune priming in matching versus non-matching environments*"

Agnes Hüttmann, 10/2012 – 10/2013: "*Genotype x genotype interactions in a marine bacteria-phage interaction*"

Lothar Miersch, 02/2011 – 10/2011: „*Life history patterns of Syngnathus typhle*“

Simone Birrer, ETH Zurich (in collaboration with Prof. Jukka Jokela) & GEOMAR, 10/2010 – 10/2011: "*How salinity affects the pipefish – Vibrio interaction*"

Isabel Keller, GEOMAR, 02/2010 – 02/2011: "*How hosts cope with a major threat in the ocean – Pipefish-Vibrio immunological and genotypic interactions*"

Chantal Kabus, GEOMAR, 02/2010 – 12/2010: "*MHC-dependent mate choice in the sex-role reversed pipefish Syngnathus typhle*"

Hendrik Eggert, University of Münster, 01/2009 – 12/2009: "*Trans-generational immune priming in Tribolium castaneum*"

Bianca Komoll, University of Münster, 01/2008 – 11/2008: "*Sexual dimorphism in the immune system of Tribolium castaneum*"

Bachelor students:

Verena Klein, GEOMAR, 01/2012 – 09/2012

Jonas Hilbert, University of Münster, 11/2008 – 05/2009

Semester students/ Internships:

Jens Daniel, University of Münster

Annette Bernhard, University of Münster

Hendrik Eggert, University of Münster

Maude Poirier, University of Basel

Teaching Experience

06/10, 06/12, 05/13	<i>"Marine Ecological Genetics"</i> , Block Course for Master students, GEOMAR Kiel (D)
01/13	<i>"Immune Priming"</i> , Lecture, University of Kiel (D)
10/12	<i>"Sexual selection"</i> , Lecture, University of Kiel (D)
10/09 – present	<i>"Current topics in Evolutionary Ecology"</i> , Seminar for Master students, GEOMAR, Kiel (D)
10/07 & 11/08	<i>"Host – Parasite – Coevolution"</i> , Block Course for Master students, University of Münster (D)
07/06 – 03/09	Organising and running seminars for Graduate Students
05/07	Experimental Ecology Excursion with Jukka Jokela & Mathias Wegner, Ticino (CH)
02/05 & 05/06	Teaching assistant at Marine Biology Excursions to Elba (It) and Banyuls-sur Mer (F) for Bachelor students

International Presentations, Invited talks, Posters and Conferences

12/11- 04/13	Invited talks at Swiss Federal Institute of Technology Zurich (ETH) (CH); University of Copenhagen (DK); University of Kiel (D); University of Basel (CH); Natural Science Museum Madrid (E); University of Münster (D); EAWAG Dübendorf (CH)
10/13	The Vast World of Evolution, VW status symposium (organisation & talk), Hannover (D)
09/13	SPP host-parasite coevolution symposium (talk & chair), Blossin (D)
08/13	ESEB, 14 th Congress of the European Society for Evolutionary Biology (talk, symposium organisation & chair), Lisbon (P)
03/13	AMPs and their Evolution (talk), Marburg (D)
06/12	2 nd Fish Genome Meeting, Oslo University (NO)
01/12	1 st Fish Genome Meeting (talk), Johann Heinrich von Thünen-Institute, Hamburg (D)
11/11	Evolution at the Sea, VW Evolutionary Biology Status Symposium (Poster) (2 nd price, Poster awards), Puan Klent (D)
08/11	ESEB, 13 th Congress of the European Society for Evolutionary Biology (talk & chair of general session), Tübingen (D)
04/11	SYNGBIO conference (talk), Fiskebäckskil (SWE)
06/10	60 th Lindau Nobel Laureate Meeting, Lindau (D)
05/10	VW Evolutionary Biology Status Symposium (talk), Fraueninsel Chiemsee (D)
10/09	Fish Evolution 2009 (poster), Berlin (D)
05/09	ESF Conference (talk), Obergurgl (A)
10/08	National Meeting for Developmental & Comparative Immunology (talk), Giessen (D)
07/08	Volkswagen Evolutionary Biology Summer School, Carolinensiel (D)
08/07	ESEB, 11 th Congress of the European Society for Evolutionary Biology (talk), Uppsala (SWE)
04/07	ESF Conference (poster), Obergurgl (A)
11/05	Joint Host-Parasite Meeting (talk), Basel (CH)

Conference organisation

10/14	" <i>The Vast World (VW) of evolution</i> ", 4 th VW Status Symposium for Evolutionary Biology in Hannover (D)
08/13	Symposium " <i>non-genetic transfer of immunity across generations</i> " at ESEB 2013
11/11	" <i>Evolution at the Sea</i> ", 3 rd VW Status Symposium for Evolutionary Biology on Sylt Island (D)
11/06	Joint host-parasite meeting at ETH Zurich (CH)

Reviewer activity

Biological Journal of the Linnean Society; BMC Ecology; BMC Evolutionary Biology; Biology Letters; Ecological Entomology; Evolution; Evolutionary Ecology; Functional Ecology; Immunological Parasitology; Infection, Genetics and Evolution; Journal of Animal Ecology; Journal of Arachnology; Journal of Ethology; Journal of Insect Physiology; Malaria Journal; Marine Biology; Molecular Ecology; Naturwissenschaften; Oikos; Parasite Immunology; PLoS One; Plos Pathogens, Proceedings of the Royal Society London, Series B; Zoonoses and public health

Research Grant Reviewer for Agence Nationale de la Recherche (ANR), France
Research Grant Reviewer for the Icelandic Research Fund, Iceland

Collaborators

Roman Asshoff, University of Münster, Germany
Marta Barluenga, National History Museum Madrid, Spain
Anders Berglund, Uppsala University, Sweden
Bernd Egger, University of Basel, Switzerland
Kjetill Jakobsen, University of Oslo, Norway
Martin Kalbe, MPI for Evolutionary Biology, Plön, Germany
Dominik Refardt, Theoretical Biology, ETH Zurich, Switzerland
Roland Regoes, Theoretical Biology, ETH Zurich, Switzerland
Lasse Riemann, Marine Biology, University of Copenhagen, Denmark
Gunilla Rosenqvist, Department of Biology, University of Trondheim, Norway
Ben Sadd, Experimental Ecology, ETH Zurich, Switzerland
Walter Salzburger, Zoological Institute, University of Basel, Switzerland
Jörn Scharsack, Institute for Evolutionary Biology, University of Münster, Germany
Hinrich Schulenburg, University of Kiel, Germany
Mathias Wegner, AWI Waddensea Station Sylt, Germany

Additional qualifications

Motorboat driving licence
Biological security laboratories II permit (potential human pathogens)

Publications

Miersch L, Mittermayr A, **Roth O** & Dierking J. Coexisting or outcompeting? – Dietary niche partitioning among three pipefish species in the western Baltic Sea revealed by stable isotope analysis. Submitted.

Roth O, Sundin J, Berglund A, Rosenqvist G & Wegner KM. MHC class I dependent male mate choice modulates visual cues in sex-role reversed pipefish. Submitted.

Joop G, **Roth O**, Schmid-Hempel P & Kurtz J. Balancing external and internal immune defences in an insect. Submitted.

16. Bolte S, **Roth O**, Philipp EER, Saphörster J, Rosenstiel P & Reusch TBH. Specific immune priming in the invasive ctenophore *Mnemiopsis leidyi*. In press.

15. Diepeveen E, **Roth O**, Salzburger W. Immune-related function of the HIVEP gene family. *Genes, Genomes, Genetics*. In Press.
 14. Haase D*, **Roth O***, Kalbe M, Schmiedeskamp G, Scharsack JP, Rosenstiel B & Reusch TBH (2013). Functional absence of MHC class II mediated immunity in pipefish *Syngnathus typhle*. *Biology Letters* 9. doi: [10.1098/rsbl.2013.0044](https://doi.org/10.1098/rsbl.2013.0044) * authors contributed equally
 13. **Roth O**, Klein V, Beemelmans A, Scharsack JP & Reusch TBH (2012). Male pregnancy and bi-parental immune priming. *American Naturalist*, 180: 802-814. doi: [10.1086/668081](https://doi.org/10.1086/668081)
 12. Birrer S, Reusch TBH & **Roth O** (2012). Lowered salinity under global change will impair pipefish immune defence. *Fish & Shellfish Immunology*, 33: 1238-1248. doi: <http://dx.doi.org/10.1016/j.fsi.2012.08.028>
 11. Landis SH, Sundin J, Rosenqvist G & **Roth O** (2012). Behavioural adjustments of a pipefish to a bacterial *Vibrio* infection. *Behavioral Ecology and Sociobiology*, 66: 1399-1405. doi: [10.1007/s00265-012-1395-3](https://doi.org/10.1007/s00265-012-1395-3)
 10. **Roth O**, Keller I, Landis SH, Salzburger W & Reusch TBH (2012). Hosts are ahead in a marine host-parasite coevolutionary arms race: innate immune system adaptation in pipefish *Syngnathus typhle* against *Vibrio* phylotypes. *Evolution*, 66: 2528-2539. doi: [10.1111/j.1558-5646.2012.01614.x](https://doi.org/10.1111/j.1558-5646.2012.01614.x).
 9. Landis SH, Kalbe M, Reusch TBH & **Roth O** (2012). Consistent pattern of local adaptation during an experimental heat wave in a pipefish-trematode host-parasite system. *Plos One*, 7: e30658.
 8. **Roth O**, Scharsack, JP, Keller I & Reusch TBH (2011). Bateman's principle and immunity in a sex-role reversed pipefish. *Journal of Evolutionary Biology* 24 (7), 1410-1420. doi:[10.1111/j.1420-9101.2011.02273.x](https://doi.org/10.1111/j.1420-9101.2011.02273.x) *
- * paper selected by the faculty of 1000
7. Asshoff R & **Roth O** (2011). Fostering students' inquired skills: Developmental time & offspring rates of flour beetles. *The American Biology Teacher* 73 (4), 232-237. doi:<http://dx.doi.org/10.1525/abt.2011.73.4.9>.
 6. **Roth O**, Kurtz J, Reusch TBH (2010). A summer heat wave decreases the immunocompetence of the mesograzers, *Idotea baltica*. *Marine Biology* 157 (7), 1605-1611. doi:[10.1007/s00227-010-1433-5](https://doi.org/10.1007/s00227-010-1433-5)
 5. **Roth O**, Joop G, Eggert H, Hilbert J, Daniel J, Schmid-Hempel P & Kurtz J (2010). Paternally derived immune priming for offspring in the red flour beetle, *Tribolium castaneum*. *Journal of Animal Ecology* 79 (2), 403-410. doi:[10.1098/rspb.2008.1157](https://doi.org/10.1098/rspb.2008.1157)
 4. **Roth O** & Kurtz J (2009). Phagocytosis mediates specificity in the immune defence of an invertebrate, the woodlouse *Porcellio scaber* (Crustacea: Isopoda). *Dev Comp Immunol* 33 (11), 1151-1155. doi:[10.1016/j.dci.2009.04.005](https://doi.org/10.1016/j.dci.2009.04.005)
 3. **Roth O**, Sadd BM, Schmid-Hempel P & Kurtz J (2009). Strain-specific priming of resistance in the red flour beetle, *Tribolium castaneum*. *Proc R Soc B-Biol Sci* 276, 145-151. doi:[10.1098/rspb.2008.1157](https://doi.org/10.1098/rspb.2008.1157)
 2. **Roth O** & Kurtz J (2008). The stimulation of immune defence accelerates development in the red flour beetle (*Tribolium castaneum*). *Journal of Evolutionary Biology* 21 (6), 1703-1710. doi:[10.1111/j.1420-9101.2008.01584.x](https://doi.org/10.1111/j.1420-9101.2008.01584.x)
 1. **Roth O**, Ebert D, Vizoso DB, Bieger A & Lass S (2008). Male-biased sex-ratio distortion caused by *Octospora bayeri*, a vertically and horizontally transmitted parasite of *Daphnia magna*. *International Journal for Parasitology* 38; 969-979. doi:[10.1016/j.ijpara.2007.11.009](https://doi.org/10.1016/j.ijpara.2007.11.009)

Articles about our research

- Keighthley MC, Wong BBM, Lieschke GJ (2013). Immune priming: mothering males modulate immunity. *Current Biology* 23, R76-R78.
- Jokela J (2010). Transgenerational immune priming as cryptic parental care. *Journal of Animal Ecology* 79, 305-307.
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