Erich Pascal Malkemper, Dr rer nat

Current position:	Research Institute of Molecular Pathology (IMP), Vienna, Austria
Date of birth:	24th June, 1985
Nationality:	German
Address:	Böcklinstraße 47/3a, 1020 Vienna, Austria
Email:	pascal.malkemper@imp.ac.at

Education/Scientific Career

2016 - 2020	Postdoc, Keays Lab, Research Institute of Molecular Pathology (IMP), Vienna, Austria
2015 - 2018	Visiting research associate, Department of Game Management and Wildlife Biology, Czech University of Life Sciences, Prague, Czech Republic
2014 - 2016	Postdoc, Department of General Zoology, University of Duisburg-Essen, Germany
2011 - 2014	PhD, Department of General Zoology, University of Duisburg-Essen, Germany Degree: *summa cum laude*, Date of defense: 20th November, 2014
2008 - 2011	Master of Science Neurobiology, Ruhr-University Bochum, Germany
2005 - 2008	Bachelor of Science Biology, Ruhr-University Bochum, Germany

Awards (selection)

2018	Grocott Award, Royal Society of Navigation
2015	Fritz-Frank-Award, German Society for Mammalian Biology
2014	Alessandro Chiabrera Memorial Award, Bioelectromagnetics Society
2014	Ig Nobel Prize in Biology, Improbable Research
2013	Best conference talk, German Society for Mammalian Biology

Fellowships

2015 - 2017	Fellow, Global Young Faculty IV
2012 - 2014	PhD scholarship, Studienstiftung des deutschen Volkes
2011 - 2012	PhD scholarship, University of Duisburg-Essen
2008 - 2011	Scholarship, Studienstiftung des deutschen Volkes

Funding as PI (sum 184,000.00 €)

2016	Innovative Project grant, German Society for Mammalian Biology “Employing bio-loggers to study magnetic alignment in mammals”
2016 - 2018	Starting grant, Mercator Research Center Ruhr (An-2016-0003) “Quantification of magnetically induced neuronal activity in the mole-rat brain by means of modern tissue clearing techniques”
2016 - 2017	Volkswagen Foundation Experiment! (A117492) “Circadian rhythms of subterranean mammals – the geomagnetic field (GMF) as a potential zeitgeber”
2015 - 2016	Research grant for excellent young scientists, University of Duisburg-Essen “The cellular basis of the mole-rat magnetic sense”

Funding as Collaborator

2018	Excellence Centre funded by the Czech Republic and the European Union (Z.02.1.01/0.0/0.0/16_019/0000803) “Effect of electromagnetic fields (EMF) on biology, ecology, and wellbeing of organisms”
2015 - 2018	Grant Agency of the Czech Republic (5-21840S) “Magnetosensitivity of dogs and other animals, magnetic alignment, cognitive maps and selective sensory attention.”

Travel grants (selection)

2014 DAAD travel stipend, BioEM2014 conference, Cape Town, South Africa
2012 Travel stipend, Company of Biologists, Sensory Ecology Workshop, Lund, Sweden
2009 Travel stipend, Studienstiftung des deutschen Volkes, internship Panay Eco-Social Conservation Project, Phillippines

Invited Talks

2018 Vachà Lab, Masaryk University, Brno, Czech Republic.
"Of pigeons and mole-rats: The mystery of iron-based magnetoreception"

2018 HSFP Workshop SeabirdAcoustics, University of Liverpool, UK.
"How do animals detect magnetic cues?"

2016 Phillips Lab, Virginia Tech, Blacksburg, VA USA.
"Overview of my current projects on hearing and magnetoreception in mammals."

2016 Güntürkün Lab, Ruhr-University Bochum, Germany.
"Studying Magnetoreception in Mammals"

2015 Central Animal Laboratory Essen, Germany.
"The Sensory Biology of Canids"

2015 Department of Physics, University Münster, Germany.
"The Magnetic Sense of Animals"

2015 Annual Meeting of the German Physical Society (DPG), Berlin, Germany:
"The Future of Magnetoreception Research in Animals"

Conference presentations

2018 LaVision BioTec UltraMicroscope User Meeting, Essen (Talk)
"Using iDISCO brain clearing to unravel the magnetic sense of mole-rats"

2017 FENS-Hertie Winter School: Neural control of behaviour - Series 1: Navigation (Poster)
"A high-sensitivity screen for magnetite-based magnetoreceptors in the pigeon inner ear"

2017 Topical Meeting of the Ethological Society, Bonn (Poster)
"Clear view on the neurobiology of mammalian magnetoreception"

2016 Conference of the Royal Society of Navigation, London (Talk)
"Are the ferrous inclusions in the mole-rat cornea magnetoreceptors?"

2015 African Small Mammal Symposium, Antananarivo (Talk)
"New insights into the magnetic sense of African mole-rats"

2014 International Bio-Logging Science Symposium, Strasbourg (Talk)
"Novel techniques to assess spontaneous magnetic behavior in predatory foxes and other free roaming animals."

2014 BioEM2014 conference, Cape Town (Poster)
"Magnetic nest building orientation in the wood mouse Apodemus sylvaticus"

2013 Annual Meeting of the German Society for Mammalian Biology, Prague (Talk)
"Hearing in red foxes: Behaviour and morphology"

2013 Ecology & Behaviour Meeting, Strasbourg (Poster)
"Magneto-acoustics in Red Foxes"

2013 Conference of the Royal Society of Navigation, London (Poster)
"Magneto-acoustics in Red Foxes"

2012 Sensory Ecology International Course for Postgraduate Students, Lund (Poster)
"The auditory sense of Red Foxes"

2011 Central European Meeting on Genes, Gene Expression & Behaviour, Novè Hrady (Talk)
"Magnetically guided behaviour in rodents"

2011 Annual Meeting of German Society for Mammalian Biology, Luxemburg (Poster)
"The dolphin cochlear nucleus"

Public Outreach Talks

2017 Die Kleine Form, University of Duisburg-Essen, Essen
"The compass needle in the haystack: Searching for the magnetoreceptor"
Watch online (in German): https://www.uni-due.de/kleine-form/malkemper.php

2015 UniKids, University of Duisburg-Essen, Duisburg
"Crazy Science – the Ig Nobel Prizes"

2015 Ig Nobel EuroTour, London
"Dogs are sensitive to small changes in the Earth's magnetic field"

2015 Ig Nobel EuroTour, Stockholm
"Dogs are sensitive to small changes in the Earth's magnetic field"

2014 Serbian Science Festival, Belgrade
"The Ig Nobel Prizes"

Referee Service

- Journal Reviewer service: Biology Letters, Behaviour, Journal of Experimental Biology,Journal of Comparative Physiology A, Mammalian Biology, PeerJ, Scientific Reports
- Expert panel member, Horizon 2020 EKLIPSE project "Impact of artificial electromagnetic radiation on wildlife"

Memberships

German Neuroscience Society (GNS), German Zoological Society (DZG), German Society for Mammalian Biology (DGS), German Ethological Society, Royal Institute of Navigation (RIN), Alumni of the German Academic Scholarship Foundation

Further qualifications

- Trained in directing animal experiments (FELASA category C)
- Laboratory safety officer (2013-2016)

Signature Dr. Erich Pascal Malkemper, Vienna 10.10.2018

Publications Dr Erich Pascal Malkemper

Hirsch-Index = 9 (Google Scholar: https://scholar.google.de/citations?user=Z_kQZiQAAAAJ&hl=de)
Public impact: https://impactstory.org/u/0000-0003-1099-0119
ORCID ID: http://orcid.org/0000-0003-1099-0119
underscored = as corresponding author

Journal articles under review

Malkemper, E.P., D. Kagerbauer, S. Nimpf, J. Shaw, P. Pichler, C.D. Treiber, M. de Jonge, D.A. Keays. No evidence for a magnetite-based magnetoreceptor in the lagena of pigeons. Current Biology. **In revision.**

Henning, Y., C. Osadnik, and **E.P. Malkemper**. EyeCi: Optical clearing and imaging of immunolabeled mouse eyes using light-sheet fluorescence microscopy. Experimental Eye Research. **In revision.**

Dollas, A., Oelschläger, H.H.A., and **E.P. Malkemper**. A brain atlas of the African mole-rat *Fukomys anselli*. The Journal of Comparative Neurology. **In revision.**

Martini, S., S. Begall, T. Findeklee, **E.P. Malkemper**, and H. Burda. Concious magnetoreception? Dogs can be trained to find a bar magnet. PeerJ. **In revision.**

Journal articles

Malkemper, E.P., M.J. Mason, D. Kagerbauer, S. Nimpf, D.A. Keays. Ectopic otoconial formation in the lagena of the pigeon inner ear. 2018. Biology Open 7: bio034462.

Malkemper, E.P., L. Peichl. Retinal photoreceptor and ganglion cell types and topographies in the red fox (*Vulpes vulpes*) and Arctic fox (*Vulpes lagopus*). 2018. The Journal of Comparative Neurology 526 (13), 2078-2098.

Landler, L., G.D. Ruxton, **E.P. Malkemper**. Advice for effectively implementing circular statistics in biology. 2018. Behavioral Ecology and Sociobiology 72: 128.

Malewski, S., **E.P. Malkemper,** F. Sedláček, R. Šumbera, K.R. Caspar, H. Burda, S. Begall. Attracted by a magnet: Exploration behaviour of rodents in the presence of magnetic objects. 2018. Behavioural Processes 151, 11-15.

Painter, M.S., M. Davis, S. Ganesh, E. Rak, K. Brumet, H. Bayne, **E.P. Malkemper**, J.B. Phillips. Evidence for plasticity in magnetic nest-building orientation in laboratory mice. 2018. Animal Behaviour 138: 93-100.

Vanderstraeten, J., P. Gailly, **E.P. Malkemper**. Low-Light Dependence of the Magnetic Field Effect on Cryptochromes: Possible Relevance to Plant Ecology. 2018. Frontiers in Plant Science 9: 121

Nimpf, S., **E.P. Malkemper**, M. Lauwers, L. Ushakova, G. Nordmann, A. Wenninger-Weinzierl, T.R. Burkard, S. Jacob, T. Heuser, G.P. Resch, D.A. Keays. Subcellular analysis of pigeon hair cells implicates vesicular trafficking in cuticulosome formation and maintenance. 2017. Elife. Nov 15;6

Gerhardt, P., Y. Henning, S. Begall, **E.P. Malkemper**. Audiograms of three subterranean rodent species (gen. *Fukomys*) determined by auditory brainstem responses reveal extremely poor high-frequency hearing. 2017. Journal of Experimental Biology 220 (23): 4377-4382.

Novakova, P., D. Koranova, S. Begall, **E.P. Malkemper**, L. Pleskac, F. Capek, J. Cerveny, V. Hart, V. Hartova, V. Husinec, H. Burda. Direction indicator and magnetic compass-aided tracking of the sun by flamingos? 2017. Folia Zoologica 66(2): 79-86.

Červený, J., H. Burda, M. Ježek, T. Kušta, V. Husinec, P. Nováková, V. Hart, V. Hartová, S. Begall, **E.P. Malkemper**. Magnetic alignment in warthogs *Phacochoerus africanus* and wild boars *Sus scrofa*. 2017. Mammal Review 47:1-5.

Painter, M.S., J.A. Blanco, **E.P. Malkemper**, C. Anderson, D.C. Sweeney, C. Hewgley, J. Červený, V. Hart, V. Topinka, E. Belotti, H. Burda, J.B. Phillips. 2016. The use of bio-loggers to characterize red fox behavior with implications for studies of magnetic alignment responses in free-roaming animals. 2016. Animal Biotelemetry 4:20.

Obleser, P., V. Hart, **E.P. Malkemper**, S. Begall, M. Holá, M. S. Painter, J. Červený, H. Burda. Compass-controlled escape behavior in roe deer. 2016. Behavioral Ecology and Sociobiology:1-11.

Malkemper, E.P., M. S. Painter, L. Landler. Shifted magnetic alignment in vertebrates: evidence for neural lateralization? 2016. Journal of Theoretical Biology 399:141-147.

Garcia Montero, A., C. Vole, H. Burda, **E.P. Malkemper,** S. Holtze, M. Morhart, J. Saragusty, T.B. Hildebrandt, S. Begall. Non-breeding eusocial mole-rats produce viable sperm - spermiogram and functional testicular morphology of *Fukomys anselli* . 2016.PLOS ONE 11:e0150112.

Nießner, C., S. Denzau, **E.P. Malkemper,** J.C. Gross, H. Burda, M. Winklhofer, L. Peichl. Cryptochrome 1 in retinal cone photoreceptors suggests a novel functional role in mammals. 2016. Scientific Reports 6, 21848.

Kolbabová, T., **E.P. Malkemper,** L. Bartos, J. Vanderstraeten, M. Turcani, H. Burda. Effect of exposure to extremely low frequency magnetic fields on melatonin levels in calves is seasonally dependent. 2015. Scientific Reports 5, 14206.

Malkemper, E.P., S.H.K. Eder, S. Begall, J.B. Phillips, M. Winklhofer, V. Hart, H. Burda. Magnetoreception in the wood mouse (*Apodemus sylvaticus*): influence of weak frequency-modulated radio frequency fields. 2015. Scientific Reports 4, 9917.

Malkemper, E.P., V. Topinka, H. Burda. A behavioral audiogram of the red fox (*Vulpes vulpes*). 2015. Hearing Research 320:30-37.

Hart, V., P. Nováková, **E.P. Malkemper**, S. Begall, V. Hanzal, M. Ježek, T. Kušta, V. Němcová, J. Adámková, K. Benediktová, J. Červený, H. Burda. Dogs are sensitive to small variations of the Earth's magnetic field. 2013. Frontiers in Zoology 10:80

Hart, V., **E.P. Malkemper**, T. Kušta, S. Begall, P. Nováková, V. Hanzal, L. Pleskac, M. Ježek, R. Policht, V. Husinec, J. Červený, H. Burda. Magnetic alignment in landing water birds: making sense of nonsense. 2013. Frontiers in Zoology 10:38.

Begall, S., **E.P. Malkemper**, J. Červený, P. Němec, H. Burda. Magnetic alignment in mammals and other animals. 2013. Mammalian Biology 78:10-20.

Hart, V., T. Kušta, P. Němec, V. Bláhová, M. Ježek, P. Nováková, S. Begall, J. Červený, V. Hanzal, **E.P. Malkemper**, K. Štípek, C. Vole, H. Burda. Magnetic alignment in carps: evidence from the Czech christmas fish market. 2012. PLOS ONE 7:e51100.

Malkemper, E.P., H. H. A. Oelschläger, S. Huggenberger. The dolphin cochlear nucleus - topography, histology and functional implications. 2012. Journal of Morphology 273**:**173-185.

Book chapters

Begall, S., **E.P. Malkemper**, M.J. Mason. Bioacoustical Studies on Subterranean Mammals. 2018. In J. Thomas & Exploring Animal Behavior through Sounds: A Primer for Methods in Bioacoustical Studies. Volume I. in press

Begall, S., H. Burda, **E.P. Malkemper**. Magnetoreception in mammals. 2014. p. 45-88. In M. Naguib (ed.), Advances in the Study of Behavior, vol. 46. Elsevier, Amsterdam.

Other publications

Malkemper, E. P., Tscheulin, T., Vanbergen, A. J., Vian, A., Balian, E. & Goudeseune, L. The impacts of artificial electromagnetic radiation on wildlife (flora and fauna). Current knowledge overview: A background document to the web conference. 2018. (A report of the Horizon 2020 Eklipse project).

Begall, S., **E.P. Malkemper**, H. Burda. 2017. Magnetic Alignment – A Widespread Phenomenon. Navigation News – Royal Society of Navigation.

Albrecht, J., C. Brenner, B. Gökce, **E.P. Malkemper**, J. Niemeyer, T. Zeume. 2017. I love to share knowledge - A personal perspective on academic teaching. University Library of University of Duisburg-Essen, ISBN: 978-3-940402-09-7

Burda, H., S. Begall, V. Hart, **E.P. Malkemper**, P. Novaková. 2014. Magnetosensitive Dogs. The Winnower 05/14.