Claudius Frank Kratochwil, PhD

Date of birth	13 December 1983 (in Freiburg, Germany)
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EDUCATION

07/2008 – 04/2013	**PhD in Neurobiology, Friedrich Miescher Institute, Basel, Switzerland** "Transcriptional and epigenetic regulation of neuronal migration and circuitry development in the murine hindbrain" Supervisor: Prof. Dr. Filippo Rijli – Date: 25 April 2014 – Grade: 6.0 (6.0=best); *summa cum laude*
09/2007 – 07/2008	**Diploma (Master) thesis, Albert-Ludwigs-University Freiburg, Germany** "Characterization of the catecholaminergic circuitry in zebrafish" Supervisor: Prof. Dr. Wolfgang Driever
10/2004 – 08/2008	**Diploma studies in biology, Albert-Ludwigs-University Freiburg, Germany** Main subjects: Developmental Biology, Neurobiology, Animal Physiology, Neuropathology Grade: 1.0 (1.0=best)

ACADEMIC APPOINTMENTS

03/2016 – 02/2019	**Project leader (temporary position until 02/2019), University of Konstanz, Germany** Host: Prof. Dr. Axel Meyer
07/2013 – 02/2016	**Postdoctoral fellow, Faculty of Biology, University of Konstanz, Germany** Host: Prof. Dr. Axel Meyer
07/2008 – 06/2013	**Doctoral student, Friedrich Miescher Institute, Basel, Switzerland** Supervisor: Prof. Dr. Filippo Rijli
09/2007 – 07/2008	**Diploma (Master) thesis, Albert-Ludwigs-University Freiburg, Germany** Supervisor: Prof. Dr. Wolfgang Driever
08/2006 – 10/2006	**Internship, Neuroscience Center, University of Helsinki, Finland** Supervisor: Prof. Dr. Eero Castrén

RESEARCH SUMMARY

Coloration is an important and fascinating feature in the biology of an organism. It plays key roles in several fundamental physiological, ecological, and evolutionary processes. Moreover, those conspicuous phenotypes challenge us to understand the cellular, developmental and genetic underpinnings of color patterns. My research uses integrative approaches to study the genomic, cellular and mechanistic substrates of color patterns and their adaptive significance. My research is driven the curiosity to uncover the secrets behind the astonishing diversity of color patterns.

RESEARCH GRANTS (external)

2017 – 2021	**DFG Scientific Networks Grant** – *"The role of interaction structure in eco-evolutionary dynamics"*, German Research Foundation (DFG), *project number: 386361673* *(with D. Farine, C. Nadell, K. Gotanda, K. Laskowski, P.O. Montiglio)*	*72'900 €*
2016 – 2019	**DFG Research Grant** – *"Evolution of transcriptional regulation as motor of morphological diversification in cichlid fishes"*, German Research Foundation (DFG), *project number: 290977748*	*325'600 €*
2015 – 2019	**Baden-Württemberg Elite Program for Postdocs** – *"Uncovering the molecular mechanisms underlying the repeated evolution of adaptive color patterns in cichlid fishes"*, Baden-Württemberg Stiftung, project number: 205	*110'000 €*
		508'500 €

RESEARCH GRANTS (internal)

2016	**Investment Program for Research** – Zukunftskolleg, University of Konstanz	*48'800 €*
2016	**Young Scholar Fund** – University of Konstanz	*23'000 €*
2015 – 2016	**Interim Grant** – Zukunftskolleg, University of Konstanz	*32'700 €*
2013 – 2018	**Sum of additional funding below 20.000 €**	*77'500 €*
		182'000 €

AWARDS AND FELLOWSHIPS

2013 – 2015	**Marie Curie Zukunftskolleg Incoming Fellowship (ZIF-MC)** Marie-Curie Program / Zukunftskolleg Konstanz, Grant no. 291784	~72'000 €
2013 – 2015	**Early Postdoc.Mobility Fellowship** Swiss National Science Foundation, Grant no. SNSF P2BSP3_148629	~55'000 €
2008 – 2013	**Scholarship "International PhD Program"** Friedrich Miescher Institute & Novartis Research Foundation, Basel	~150'000 €
		~277'000 €

PROFESSIONAL MEMBERSHIPS (societies, faculty positions, programs, working groups)

2018 –	Faculty member, Independent Postdoctoral Researcher at the University of Konstanz
2018 –	Member, European Society for Evolutionary Biology
2017 – 2018	Member, sDiv-working group "The genomic evolution of key adaptive traits – utilizing the potential of non-model organisms" – sGENEVA, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig
2016 –	Member, German Zoological Society / Deutsche Zoologische Gesellschaft (DZG)
2015 –	Faculty member, International Max Planck Research School (IMPRS) for Organismal Biology, Max Planck Institute for Ornithology and University of Konstanz, Germany
2015 –	Fellow, Baden-Württemberg Elite Program
2014 –	Principal investigator, KoRS Chemical Biology graduate school, University of Konstanz, Germany
2014 –	Member, Society for Molecular Biology and Evolution (SMBE)
2014 –	Member, German Genetics Society / Gesellschaft für Genetik (GfG)
2013 –	Fellow, Zukunftskolleg, University of Konstanz, Germany

PROFESSIONAL SERVICES

Reviews for international scientific journals

AIMS Genetics, Advances in Bioinformatics, BMC Genetics, Development, eLife, European Journal of Neuroscience, Evo-Devo, Fish and Fisheries, Int. Journal of Molecular Sciences, Nature Communications, Journal of Comparative Neurology, PeerJ, Plos One, Scientific Reports, Zebrafish

Reviews for research agencies

Icelandic Research Fund

COMMITTEE WORK

- Zukunftskolleg´s Internal Liaison Board (2017 –), University of Konstanz, Germany
- PhD Committee (2014 –), Jennifer Knaus, Department of Chemistry & KoRS Chemical Biology graduate school, University of Konstanz, Germany

TEACHING

2013 – 2018	**Lecture "Evolution and Behavior"** Lectures given on: "Evolution of the nervous system" and "Evolutionary Developmental Biology" (Total number of lectures given: 5) Bachelor level, University of Konstanz, Germany

2014 – 2018 **Lecture "Advanced Course Molecular Evolutionary Biology"**
Lectures given on: "Evolution of sensory systems", "Epigenetics and Evolution" and "How to create efficient figures" (Total number of lectures given: 11)
Master level, University of Konstanz, Germany

2014 – 2017 **Lecture "Evolutionary Organismal Biology"**
Lectures given on: "Transcriptional regulation, Epigenetics and Evolution" and "The genetic basis of coloration" (Total number of lectures given: 4)
Master level, University of Konstanz, Germany
Evaluation 2016: Teaching-Learning-Index: 1.72 (Range: 1.0 – 5.0; 1.0=best; Department average for lectures: 2.01; Average complete lecture series: 1.91); Satisfaction: 1.75 (Range: 1.0 – 5.0; 1.0=best)

2015 – 2018 **Lecture "Methods in Biology"**
Lectures given on: "Methods for linking Phenotypes to Genotypes" (Total number of lectures given: 3)
Master level, University of Konstanz, Germany

2016 **Lecture "Gene technology"**
Lecture given on: "Gene technology in Vertebrates" (Total number of lectures: 1)
Refresher course for high school teachers, University of Konstanz, Germany

2014 – 2018 **Practical Course "Advanced Course Molecular Evolutionary Biology"** (Assistant)
Master level, University of Konstanz, Germany

Evaluation 2015: Teaching-Learning-Index: 1.31 (Range: 1.0 – 5.0; 1.0=best; Department average for courses: 2.03); Satisfaction: 1.38 (Range: 1.0 – 5.0; 1.0=best)

2017 – 2018 **Practical Course "Principles of Zoology"**
Organizer of 2 x 1/2-day course on "Anatomy of the Rat" (Total number of courses given: 2)
Bachelor level, University of Konstanz, Germany

2013 – 2017 **Seminar "Advanced Seminar in Evolutionary and Developm. Biology"** (Organizer)
Master level, University of Konstanz, Germany

2014 – 2018 **Seminar "Evolution and Zoology"** (Organizer)
Master level, University of Konstanz, Germany
Evaluation 2016: Teaching-Learning-Index: 1.74 (Range: 1.0 – 5.0; 1.0=best; Department average for seminars: 2.12); Satisfaction: 1.75 (Range: 1.0 – 5.0; 1.0=best)

2015 **Seminar "Innovations in Vertebrate Evolution"** (Organizer)
2 SWS, Master level, University of Konstanz, Germany

2016 **Seminar "Evo-Devo"** (Organizer)
Master level, University of Konstanz, Germany

2016 **Seminar "Genome Evolution"** (Organizer)
Master level, University of Konstanz, Germany
Evaluation: Teaching-Learning-Index: 1.43 (Range: 1.0 – 5.0; 1.0=best; Department average for seminars: 2.12); Satisfaction: 1.50 (Range: 1.0 – 5.0; 1.0=best)

2017 **Seminar "Human Evolutionary Genetics"** (Organizer)
Master level, University of Konstanz, Germany

SUPERVISION

Doctoral students (co-supervised with Prof. Dr. Axel Meyer)

- Sabine Urban, Doctoral/PhD student (BW Elite Program, 2016 – 2019)
- Maggie Sefton, Doctoral/PhD student (Hector Fellowship, 2014 – 2017)
- Yipeng Liang, Doctoral/PhD student (CSC Fellowship, 2014 – 2019)

Master students (co-supervised with Prof. Dr. Axel Meyer)

- Jan Gerwin, Master student (2017)

Bachelor students (co-supervised with Prof. Dr. Axel Meyer)

- Laura Geißler, Bachelor student (2014)
- Lukas Kaminski, Bachelor student (2015)

FURTHER EDUCATION

2015 – 2016 **Certificate "Didactics in Higher Education"**
200 teaching units*, Center of Higher Didactics Baden-Württemberg, Germany

2015 – 2016 **Certificate "Leadership, Management and Transfer of Knowledge"**
70 teaching units*, Academic Staff Development, University of Konstanz, Germany

* 45 minutes each

ORGANIZATION OF MEETINGS/SYMPOSIA

2018 **Symposium "Evo-devo of colour pattern formation"**
European Soc. for Evol. Developmental Biology (EED); 26 – 29 June 2018, Galway, Ireland

2016 **Symposium "Integrating the genotype-phenotype map with concepts of evolutionary-developmental biology"** *(with Joost Woltering)*
European Soc. for Evol. Developmental Biology (EED); 26 – 29 July 2016, Uppsala, Sweden

PRESENTATIONS

Talks and seminars (selection)

- **German Zoological Society (DZG), Greifswald, Germany**, 11 – 14 September 2018: Agouti-related peptide 2 drives convergent evolution of stripe patterns across cichlid fish radiations.
- **Japanese-German Frontiers of Science Symposium (organized by Humboldt foundation and Japan Society for the Promotion of Science), Kyoto, Japan**, 6 – 9 September 2018: The genomic basis of color pattern diversification and repeated evolution. (Invited talk)
- **Joint Congress on Evolutionary Biology, Montpellier, France**, 19 – 22 August 2018: Agouti-related peptide 2 drives convergent evolution of stripe patterns across cichlid fish radiations
- **Euro Evo Devo (EED) Meeting, Galway, Ireland**, 26 – 29 June 2018: Agouti-related peptide 2 drives convergent evolution of stripe patterns across cichlid fish radiations.
- **Redpath Seminar, McGill University, Montreal, Canada**, 13 April 2018: How cichlids got their stripes … and lost them again. (Invited talk)
- **German Centre for Integrative Biodiversity Research (iDiv) Leipzig, Germany**, 18 December 2017; sGENEVA workshop: Stripeless drives convergent evolution of stripe patterns across cichlids.

Statistics and bibliometrics

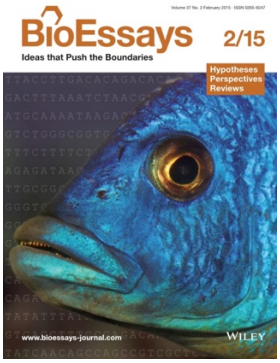
1st author / total number peer-reviewed publications: 10 / 14
Google Scholar: h-index = 8, total citations = 333
Web of science: h-index = 7, total citations = 232

Publications in peer-reviewed scientific journals (☯ equal contribution; ✉ corresponding)

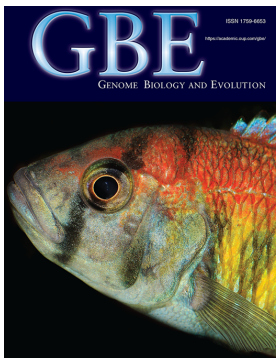
1. Tervonen TA, Louhivuori V, Sun X, Hokannen M-E, Kratochwil CF, Zebryk P, Castren E, and Castren ML (2009): Aberrant differentiation of glutamatergic cells in neocortex of mouse model for fragile X syndrome. ***Neurobiology of Disease*** 33, 250–259.
2. Kastenhuber E ☯, Kratochwil CF ☯, Ryu S ☯, Schweitzer J, and Driever W (2010): Genetic dissection of dopaminergic and noradrenergic contributions to catecholaminergic tracts in early larval zebrafish. ***The Journal of Comparative Neurology*** 518, 439–458.
3. Di Meglio T ☯, Kratochwil CF ☯, Vilain N, Loche A, Viatobello A, Yonehara K, Roska B, Peters A, Eichmann A, Wellik D, Ducret S, and Rijli FM (2013): Ezh2 orchestrates topographic tangential migration and connectivity of precerebellar neurons. ***Science*** 339, 204-207.

   ⇒ Key publication from my Ph.D. thesis showing the role of hox genes and epigenetic factors for controling and guiding the dynamic migration of neuronal subsets in the murine hindbrain.
4. Minoux M, Kratochwil CF, Ducret S, Amin S, Kitazawa T, Kurihara H, Bobola N, Vilain N, and Rijli FM (2013): Mouse Hoxa2 genetic analysis provides a model for microtia and auricle duplication. ***Development*** 140, 4386-4397.
5. Kratochwil CF and Meyer A (2015): Closing the genotype-phenotype gap: Emerging technologies for evolutionary genetics in ecological model vertebrate systems. ***BioEssays*** 37, 213-226.

   ⇒ A comprehensive review article and conceptual outline how to tackle important questions in non-model organisms taking advantage of tools from model organisms (and why it is not enough to study those).



6. Kratochwil CF and Meyer A (2015): Mapping active promoters by ChIP-seq profiling of H3K4me3 in cichlid fish–a first step to uncover cis-regulatory elements in ecological model teleosts. ***Molecular Ecology Resources*** 15, 761–771.
7. Kratochwil CF ☯, Sefton MS ☯, and Meyer A (2015): Embryonic and larval development in the Midas cichlid fish species flock (*Amphilophus spp.*): a new evo-devo model for the investigation of adaptive novelties and species differences. ***BMC Developmental Biology*** 15: 12.
8. Bechara A, Laumonnerie C, Vilain N, Kratochwil CF, Cankovic V, Maiorano N, Kirschmann M, Ducret S, and Rijli FM (2015): *Hoxa2* selects barrelette neuron identity and connectivity in the mouse somatosensory brainstem. ***Cell Reports*** 13, 783-797.
9. Kratochwil CF ☯, Geissler L ☯, Irisarri I ☯, and Meyer A (2015): Molecular evolution of the neural crest regulatory network in ray-finned fish. ***Genome Biology and Evolution*** 7 (11), 3033-3046.
10. Renier N, Dominici C, Erzurumlu R, Kratochwil CF, Rijli FM, Gaspar P, and Chédotal A (2017): A



mutant with bilateral whisker to barrel inputs unveils somatosensory mapping rules in the cerebral cortex. ***eLife*** 6, e23494.

11. Kratochwil CF, Maheshwari U, and Rijli FM (2017): The Long Journey Of Pontine Nuclei Neurons: From Rhombic Lip To Cortico-Ponto-Cerebellar Circuitry. ***Frontiers in Neural Circuits*** 11, 33.
12. Kratochwil CF, Sefton MS, Liang Y, and Meyer A (2017): *Tol2* transposon-mediated transgenesis in the Midas cichlid (*Amphilophus citrinellus*) — towards understanding gene function and regulatory evolution in an ecological model system for rapid phenotypic diversification. ***BMC Developmental Biology*** 17: 15.
13. Saemi-Komsari M, Mousavi-Sabet H, Kratochwil CF, Sattari M, Eagderi S, and Meyer A (2018): Early developmental and allometric patterns in the electric yellow cichlid *Labidochromis caeruleus*. ***Journal of Fish Biology*** 92:1888–1901.
14. Kratochwil CF ✉, Liang Y, Gerwin J, Woltering JM, Urban S, Henning F, Machado-Schiaffino G, Hulsey CD, and Meyer A ✉ (2018): Agouti-related peptide 2 facilitates convergent evolution of stripe patterns across cichlid fish radiations. ***Science*** 362, 457-460.

    ⇒ Here we unveil how different regulatory mutations of a single gene act as an evolutionary dynamic on/off switch driving the repeated (convergent) evolution of stripe patterns, a complex colour patterns in the species-rich family of East-African cichlid fishes with its over 1200 species.

Preprints

1. Montiglio PO, Gotanda KM, Kratochwil CF, Laskowski KL, Nadell CD, and Farine DR (2018): Nested interaction networks represent a missing link in the study of behavioural and community ecology. ***arXiv***:1804.00927 [q-bio.PE].

Short communications

1. Kratochwil CF ✉ and Meyer A ✉ (2015): Evolution: Tinkering within gene regulatory landscapes. ***Current Biology*** 25 (7), R285-R288.

Book chapters and comments

1. Kratochwil CF and Rijli FM (2014): The Cre/lox system to assess the development of the mouse brain, ***Brain development: Methods and Protocols, Methods in Molecular Biology*** (Simon G. Sprecher ed.), Springer, New York. 1082, 295–313.
2. Kratochwil CF (2015): Comment on: Forgetting – A cognitive neuroscience perspective. In: Galizia G and Schulman D (eds.), ***What is Forgetting?***, Jerusalem: Magnes Press of the Hebrew University.