

# INGO BRAASCH

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Department of Integrative Biology  
Michigan State University  
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## EDUCATION

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- 2009 **Doctoral degree (Dr. rer. nat.) in Biology** awarded with distinction (*summa cum laude*)  
University of Würzburg (Germany) – Department of Physiological Chemistry
- 2004 **Diploma in Biology**  
University of Konstanz (Germany) – Zoology/Evolutionary Biology
- 1999-2004 **Studies in Biology**, University of Konstanz

## APPOINTMENTS

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- 2016-present **Assistant Professor**, Michigan State University – Department of Integrative Biology
- 2016-present **Faculty Member**, MSU Ecology, Evolutionary Biology, and Behavior (EEBB) Program
- 2016-present **Faculty Member**, MSU Genetics and Genome Sciences (GGS) Graduate Program
- 2016-present **Faculty Member**, NSF BEACON Center for the Study of Evolution in Action
- 2010-2015 **Postdoctoral Fellow**, University of Oregon – Institute of Neuroscience  
Advisor: Dr. John H. Postlethwait
- 2009-2010 **Postdoctoral Fellow**, University of Würzburg – Department of Physiological Chemistry  
Advisor: Dr. Manfred Schartl
- 2005-2009 **Doctoral Student**, University of Würzburg – Department of Physiological Chemistry  
Advisors: Dr. Manfred Schartl, Dr. Jean-Nicolas Volff (ENS Lyon)
- 2004-2005 **Research Assistant**, University of Konstanz – Zoology/Evolutionary Biology  
Advisor: Dr. Axel Meyer
- 2003-2004 **Diploma Student**, University of Konstanz – Zoology/Evolutionary Biology  
Advisor: Dr. Axel Meyer
- 2000-2003 **Student Research Assistant**, University of Konstanz – Zoology/Evolutionary Biology  
Advisor: Dr. Axel Meyer

## PUBLICATIONS

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Citation Indices (GoogleScholar Citations 10/12/2020):    citations 5,005    h-index 32    i10-index 47

- shared first authorship    \* corresponding author    † shared senior authorship

*Mentee contributions:* <sup>a</sup> graduate student, <sup>b</sup> postdoc, <sup>c</sup> undergraduate, <sup>d</sup> technician

62. **Braasch, I.** (2020) Genome Evolution: Domestication of the Allopolyploid Goldfish. *Current Biology* 30, R812-R815.
61. Kang, D., Stöck, M., Kneitz, S., ...(19 authors)..., **Braasch, I.**, Trifonov, V., Warren, W., Meyer, A., Guiguen, Y., and Schartl, M. (2020) An ancient whole genome duplication in a living fossil: the sterlet sturgeon genome sequence and the mechanisms of segmental rediploidization. *Nature Ecology & Evolution* 4, 841-852.
60. **Braasch, I.\***, and McCluskey, B. M. (2020) Zebrafish Taxonomy and Evolution. In: *The Zebrafish in Biomedical Research*, Eds. Cartner, S., Eisen, J. S. Farmer, S., Guillemin, K., Kent, M., and Sanders, G.
59. Postlethwait, J. H., and **Braasch, I.** (2020) Zebrafish Genetics. In: *The Zebrafish in Biomedical Research*, Eds. Cartner, S., Eisen, J. S. Farmer, S., Guillemin, K., Kent, M., Sanders, G.
58. Cal, L.<sup>a</sup>, Suarez-Bregua, P., **Braasch, I.**, Irion, U., Kelsh, R., Cerdá-Reverter, J. M., and Rotllant, J. (2019): Loss-of-function mutations in the melanocortin-1-receptor (Mc1r) cause disruption of dorso-ventral countershading in teleost fish. *Pigment Cell and Melanoma Research* 32, 817-828.



57. Ganz, J., Melancon, E., Wilson, C., Amores, A., Batzel, P., Strader, M., **Braasch, I.**, Diba, P., Kuhlman, J. A., **Postlethwait, J. H.**, and Eisen, J. S. (2019): Epigenetic factors Dnmt1 and Uhrf1 coordinate intestinal development. *Developmental Biology*, 455, 473-484.
56. Darnet, S., Dragalzew, A. C., Amaral, D. B., Sousa, J. F., *Thompson, A. W.*<sup>b</sup>, Cass, A. N., Lorena, J., Pires, E. S., Costa, C. M., Sousa, M. P., Froebisch, N. B., Oliveira, G., Schneider, P. N., Davis, M. C., **Braasch, I.**, and Schneider, I. (2019): Deep evolutionary origin of limb and fin regeneration. *PNAS* 116, 15106-1515. Covered by [MSU Today: Fish reveal limb-regeneration secrets](#); [Nature LabAnimal Research Highlights. Regeneration: Regrowing lobed fins. LabAnimal](#) 48, 262; and others.
55. Wolverson, E., Wong, M., Davis, P. E., Hoglin, B., **Braasch, I.**, and Dores, R. (2019): Analyzing the pharmacological properties of gar (*Lepisosteus oculatus*) melanocortin receptors: Evaluating interactions with MRAP1 and MRAP2. *General and Comparative Endocrinology* 282, 113215.
54. *Cal, L.*<sup>a</sup>, Suarez-Bregua, P., Comesaña, P., Owen, J., **Braasch, I.**, Kelsh, R., Cerdá-Reverter, J. M., and Rotllant, J. (2019): Countershading in zebrafish results from an Asip1 controlled dorsoventral gradient of pigment cell differentiation. *Scientific Reports* 9, 3449.
53. Spiewak, J. E., Bain, E. J., Liu, J., Kou, K., Sturiale, S. L., Patterson, L. B., *Diba, P.*<sup>c</sup>, Eisen, J., **Braasch, I.**, Ganz, J., and Parichy, D. M. (2018): Evolution of Endothelin signaling and diversification of adult pigment pattern in *Danio* fishes. *PLoS Genetics* 14, e1007538. [Recommended by Faculty of 1000.](#)
52. **Braasch, I.**, Bobe, J., Guiguen, Y., and Postlethwait, J. H. (2018): Reply to: Sandve et al.: To sub- or neo-functionalize after whole genome duplication, that is the question. *Nature Genetics* 50, 910-911.
51. Desvignes, T., Carey, A., **Braasch, I.**, Enright, T., and Postlethwait, J. H. (2018): Skeletal development in the heterocercal caudal fin of spotted gar (*Lepisosteus oculatus*) and other Lepisosteiformes. *Developmental Dynamics* 247, 724-740.
50. **Braasch, I.\*** and Postlethwait, J. H.\* (2017): The Spotted Gar: Genomic Journeys into a Lost World. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 328, 593-595.
49. Kawasaki, K., Mikami, M., Nakatomi, M., **Braasch, I.**, Batzel, P., Postlethwait, J. H., Sato, A., Sasagawa, I., and Ishiyama, M. (2017): SSCP Genes and Their Relatives in Gar: Rapid Expansion of Mineralization Genes in Osteichthyans. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 328, 645-665.
48. *Cal, L.*<sup>a</sup>, Megías, M., Cerdá-Reverter, J. M., Postlethwait, J. H., **Braasch I†**, and Rotllant J.† (2017): BAC Recombineering of the Agouti Loci from Spotted Gar and Zebrafish Reveals the Evolutionary Ancestry of Dorsal-Ventral Pigment Asymmetry in Fish. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 328, 697-708. Covered by [MSU CNS News: Gars and Stripes: Research 'flags' evolutionary ancestry of pigment patterns in zebrafish, spotted gar.](#)
47. Pasquier, J., **Braasch, I.**, Batzel, P., Cabau, C., Montfort, J., Nguyen, T., Jouanno, E., Berthelot, C., Klopp, C., Journot, L., Postlethwait, J. H., Guiguen, Y., and Bobe, J. (2017): Evolution of gene expression after whole-genome duplication: New insights from the spotted gar genome. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 328, 709-721.
46. *Cal, L.*<sup>a</sup>, Suarez-Bregua, P., Cerdá-Reverter, J. M., **Braasch, I.†**, and Rotllant, J.† (2017): Fish pigmentation and the melanocortin system. *Comparative Biochemistry and Physiology A: Molecular and Integrative Physiology* 211, 26-33.
45. Suárez-Bregua, P., Torres, E., Saxena, A., Guerreiro, P. M., **Braasch, I.**, Prober, D., Morán, P., Cerda Reverter, J. M., Du, S., Adrio, F., Power, D., Canario, A., Postlethwait, J.H., Bronner, M., Cañestro, C., and Rotllant, J. (2017): Pth4, an ancient Parathyroid Hormone lost in eutherian mammals, reveals a new brain-to-bone signaling pathway. *The FASEB Journal* 31, 569-583.
44. Sukeena, J. M., Galicia, C. A., Wilson, J. D., McGinn, T., Boughman, J. W., Robison, B. D., Postlethwait, J. H., **Braasch, I.**, Stenkamp, D. L., and Fuerst, P. G. (2016): Characterization and Evolution of the Spotted Gar Retina. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 326, 403-421.
43. Askary, A., Smeeton, J., Paul, S., Schindler, S., **Braasch, I.**, Ellis, N. A., Postlethwait, J., Miller, C. T., and Crump, J. G. (2016): Ancient origin of lubricated joints in bony vertebrates. *eLife* 5, e16415. [Recommended by Faculty of 1000.](#)
42. **Braasch, I.\***, Gar Genome Consortium (59 authors including *Sydes, J.*<sup>a</sup>), and Postlethwait, J.H.\* (2016): The spotted gar genome illuminates vertebrate evolution and facilitates human-teleost comparisons. *Nature Genetics* 48, 427-437. [News and Views by D. Parichy \(2016\): The gar is a fish... is a bird... is a mammal? Nature Genetics](#) 48, 344-345. Covered by [MSU Today: Fresh discoveries from an old fish: Gar is the new biomedical friend of zebrafish and human](#) and others.



41. Pasquier, J., Cabau, C., Nguyen, T., Jouanno, Severac, D., **Braasch, I.**, Journot, L., Pontarotti, P., Klopp, C., Postlethwait, J.H., Guiguen, Y., and Bobe, J. (2016): Gene evolution and gene expression after whole genome duplication in fish: The PhyloFish database. *BMC Genomics* 17, 368.
40. **Braasch, I.\***, Peterson, S. M., Desvignes, T., McCluskey, B. M., Batzel, P., and Postlethwait, J. H.\* (2015): A New Model Army: Emerging fish models to study the genomics of vertebrate Evo-Devo. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 324, 316-341. [Recommended by Faculty of 1000.](#)  
39. Gehrke, A. R., Schneider, I., Tena, J.J., Gomez-Marin, C., Nakamura, T., Chandran, M., de la Calle-Mustienes, E., **Braasch, I.**, Postlethwait, J.H., Gomez-Skarmeta, J.L., and Shubin, N.H. (2015): Deep conservation of autopod enhancers in a non-teleost rayfin fish. *Proceedings of the National Academy of Sciences* 112, 803-808. Covered by the [The Washington Post](#) and others. [Recommended by Faculty of 1000.](#) 
38. **Braasch, I.\***, and Schartl, M. (2014): Evolution of endothelin receptors in vertebrates. *General and Comparative Endocrinology* 209, 21-34. [Recommended by Faculty of 1000.](#) 
37. Ganz, J., Kroehne, V., Freudenreich, D., Machate, A., Geffarth, M., **Braasch, I.**, Kaslin, J., and Brand, M. (2014): Subdivisions of the adult zebrafish pallium based on molecular marker analysis. *F1000Research* 3, 308.
36. Santos, M. E., **Braasch, I.**, Boileau, N., Meyer, B. S., Sauter, L., Böhne, A., Belting, H. G., Affolter, M., and Salzburger, W. (2014): The evolution of cichlid fish egg-spots is linked with a *cis*-regulatory change. *Nature Communications* 5, 5149. Covered by [Around the O: UO zebrafish help explain egg-spots on African cichlid's fins.](#)
35. **Braasch, I.**, Guiguen, Y., [Loker, R.<sup>c</sup>](#), Letaw, J. H., Ferrara, A., Bobe, J., and Postlethwait, J. H. (2014): Connectivity of vertebrate genomes: *Paired-related homeobox (Prrx)* genes in spotted gar, basal teleosts, and tetrapods. *Comparative Biochemistry and Physiology C: Toxicology and Pharmacology* 163, 24-36.
34. Meng, F., **Braasch, I.**, Phillips, J. B., Lin, X., Titus, T., Zhang, C., and Postlethwait, J. H. (2013): Evolution of the eye transcriptome under constant darkness in *Sinocyclocheilus* cavefish. *Molecular Biology and Evolution* 30, 1527-1543.
33. Amemiya, C. T., Alföldi, J., Lee A. P., Fan, S., Philippe H., MacCallum, I., **Braasch, I.**, and 84 more authors (2013): Analysis of the African coelacanth genome sheds light on tetrapod evolution. *Nature* 496, 311-316. Covered by [Around the O: UO researchers had role in international study of an ancient fish](#), [Nature News](#), [Current Biology](#), [The New York Times](#), [BBC](#), and others.  
32. Schartl, M., Walter, R. B., Shen, Y., Garcia, T., Catchen, J., Amores, A., **Braasch, I.**, Chalopin, D., Volff, J. N., Lesch, K. P., Bisazza, A., Minx, P., Hillier, L., Wilson, R. K., Fuerstenberg, S., Boore, J., Searle S., Postlethwait, J. H., and Warren, W. C. (2013): The genome of the platyfish, *Xiphophorus maculatus*, provides insights into evolutionary adaptation and several complex traits. *Nature Genetics* 45, 567-572.
31. **Braasch, I.** and Postlethwait, J. H. (2012): Fish polyploidy and the teleost genome duplication. In: *Polyploidy and Genome Evolution*, Eds. Soltis, P. S. and Soltis, D. E.
30. Anderson, J. L., Rodriguez Mari, A., **Braasch, I.**, Amores, A., Hohenlohe, P., Batzel, P., and Postlethwait, J. H. (2012): Multiple Sex-Associated Regions and a Putative Sex Chromosome in Zebrafish Revealed by RAD Mapping and Population Genomics. *PLoS One* 7, e40701.
29. DeLaurier, A., Nakamura, Y., **Braasch, I.**, Khanna, V., Kato, H., Wakitani, S., Postlethwait, J. H., and Kimmel, C. B. (2012): Histone deacetylase-4 is required during early cranial neural crest development for generation of the zebrafish palatal skeleton. *BMC Developmental Biology* 12, 16.
28. Catchen, J. M., **Braasch, I.**, and Postlethwait, J. H. (2011): Conserved synteny and the zebrafish genome. *Methods in Cell Biology* 104, 259-285.
27. **Braasch, I.\*** and Postlethwait, J. H. (2011): The teleost *agouti related protein 2* gene is an ohnolog gene missing from the tetrapod genome. *Proceedings of the National Academy of Sciences* 108, E47-E48.
26. McFarlane, S., Svingen, T., **Braasch, I.**, Koopman, P., Schartl, M., and Wilhelm, D. (2011): Expansion of the *Ago* gene family in the teleost clade. *Development, Genes and Evolution* 221, 95-104.
25. **Braasch, I.\*** and Liedtke, D. (2011): Pigment genes and cancer genes. In: *Encyclopedia of Fish Physiology: From Genome to Environment*, Eds. Farrell, A. P., Cech, J. J., Richards, J. G. and Stevens, E. D.
24. Zhou, Q., **Braasch, I.**, Froschauer A., Böhne A., Schultheis C., Schartl M., and Volff J.N. (2010): A novel marker for the platyfish (*Xiphophorus maculatus*) W chromosome is derived from a Polinton transposon. *Journal of Genetics and Genomics* 37, 181-188.

23. Herpin, A.●, **Braasch, I.●**, Kräussling, M., Schmidt, C., Thoma, E., Nakamura, S., Tanaka, M., and Schartl, M. (2010): Transcriptional rewiring of the sex determining *dmrt1* gene duplicate by transposable elements. *PLoS Genetics* 6, e1000844. Covered by [Nature Research Highlights. Genetics: Male regulator switched. Nature 463, 1003](#)
22. Laisney, J., **Braasch, I.**, Walter, R. B., Meierjohann, S., and Schartl, M. (2010): Lineage-specific co-evolution of the EGFR/EGF ligand signaling system. *BMC Evolutionary Biology* 10, 27.
21. **Braasch, I.\***, Brunet, F., Volff, J. N., and Schartl, M. (2009): Pigmentation pathway evolution after whole genome duplication in fish. *Genome Biology and Evolution* 1, 479-493.
20. **Braasch, I.**, Liedtke, D., Volff, J. N., and Schartl, M. (2009): Pigmentary function and evolution of *tyrp1* gene duplicates in fish. *Pigment Cell and Melanoma Research* 22, 830-850.
19. **Braasch, I.** and Salzburger, W. (2009): *In ovo omnia*: diversification by duplication in fish and other vertebrates. *Journal of Biology* 8, 25.
18. Salzburger, W.●, Steinke, D.●, **Braasch, I.●**, and Meyer, A. (2009): Genome desertification in eutherians: can gene deserts explain the uneven distribution of genes in placental mammalian genomes? *Journal of Molecular Evolution* 69, 207-216.
17. **Braasch, I.**, Volff, J. N., and Schartl, M. (2009): The endothelin system: evolution of vertebrate-specific ligand-receptor interactions by three rounds of genome duplication. *Molecular Biology and Evolution* 26, 783-799.
16. Klüver, N., Herpin, A., **Braasch, I.**, Drießle, J., and Schartl, M. (2009): Regulatory back-up circuit of medaka *wt1* orthologs ensures PGC maintenance. *Developmental Biology* 325, 179-188.
15. **Braasch, I.\***, Volff, J. N., and Schartl, M. (2008): The evolution of teleost pigmentation and the fish-specific genome duplication. *Journal of Fish Biology* 73, 1891-1918.
14. Böhne, A., Schultheis, C., Zhou, Q., Froschauer, A., Schmidt, C., Selz, Y., **Braasch, I.**, Ozouf-Costaz, C., Dettai, A., Séguens, B., Couloux, A., Bernard-Samain, S., Chilmoczyk, S., Gannouni, A., Madani, K., Brunet, F., Galiana-Arnoux, D., Schartl, M., and Volff, J. N. (2008): Identification of new gene candidates on the sex chromosomes of the platyfish *Xiphophorus maculatus*. *Cybiurn* 32, 69-71.
13. Salzburger, W., Renn, S. C., Steinke, D., **Braasch, I.**, Hofmann, H. A., and Meyer, A. (2008): Annotation of expressed sequence tags for the East African cichlid fish *Astatotilapia burtoni* and evolutionary analyses of cichlid ORFs. *BMC Genomics* 9, 96.
12. Salzburger, W.●, **Braasch, I.●**, and Meyer, A. (2007): Adaptive sequence evolution in a color gene involved in the formation of the characteristic egg-dummies of male haplochromine cichlid fishes. *BMC Biology* 5, 51. Covered by [New Scientist](#).
11. Siegel, N.<sup>c</sup>, Hoegg, S., Salzburger, W., **Braasch, I.**, and Meyer, A. (2007): Comparative genomics of ParaHox clusters of teleost fishes: gene cluster breakup and the retention of gene sets following whole genome duplications. *BMC Genomics* 8, 312.
10. **Braasch, I.\***, Schartl, M., and Volff, J. N. (2007): Evolution of pigment synthesis pathways by gene and genome duplication in fish. *BMC Evolutionary Biology* 7, 74.
9. Selz, Y., **Braasch, I.**, Hoffmann, C., Schmidt, C., Schultheis, C., Schartl, M., and Volff, J. N. (2007): Evolution of melanocortin receptors in teleost fish: The melanocortin type 1 receptor. *Gene* 401, 114-122.
8. Schultheis, C., Zhou, Q., Froschauer, A., Nanda, I., Selz, Y., Schmidt, C., Matschl, S., Wenning, M., Veith, A.-M., Naciri, M., Hanel, R., **Braasch, I.**, Dettai, A., Böhne, A., Ozouf-Costaz, C., Chilmoczyk, S., Séguens, B., Couloux, A., Bernard-Samain, S., Schmid, M., Schartl, M., and Volff, J. N. (2006): Molecular analysis of the sex-determining region of the platyfish *Xiphophorus maculatus*. *Zebrafish* 3, 299-303.
7. Froschauer, A., **Braasch, I.**, and Volff, J. N. (2006): Fish genomes, comparative genomics and vertebrate evolution. *Current Genomics* 7, 43-57.
6. **Braasch, I.**, Salzburger, W., and Meyer, A. (2006): Asymmetric evolution in two fish-specifically duplicated receptor tyrosine kinase paralogs involved in teleost coloration. *Molecular Biology and Evolution* 23, 1192-1202.
5. Steinke, D., Salzburger, W., **Braasch, I.**, and Meyer, A. (2006): Many genes in fish have species-specific asymmetric rates of molecular evolution. *BMC Genomics* 7, 20.
4. Lang, M., Miyake, T., **Braasch, I.**, Tinnemore, D., Siegel, N.<sup>c</sup>, Salzburger, W., Amemiya, C. T., and Meyer, A. (2006): A BAC library of the East African haplochromine cichlid fish *Astatotilapia burtoni*. *Journal of Experimental Zoology B: Molecular and Developmental Evolution* 306, 35-44.



3. Taylor, J. S., **Braasch, I.**, Frickey, T., Meyer, A., and Van de Peer, Y. (2003): Genome duplication, a trait shared by 22000 species of ray-finned fish. *Genome Research* 13, 382-390. [Recommended by Faculty of 1000.](#) 
2. Van de Peer, Y., Taylor, J. S., **Braasch, I.**, and Meyer, A. (2001): The ghost of selection past: rates of evolution and functional divergence of anciently duplicated genes. *Journal of Molecular Evolution* 53, 436-446. [Recommended by Faculty of 1000.](#) 
1. Taylor, J. S., Van de Peer, Y., **Braasch, I.**, and Meyer, A. (2001): Comparative genomics provides evidence for an ancient genome duplication event in fish. *Philosophical Transactions of the Royal Society London, Series B: Biological Sciences* 356, 1661-1679.

## PRESENTATIONS

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### Talks • invited

- 2019 *Odyssey of Strange Fish: Investigating 'Ancient Fish' Genomes and Development to Illuminate Vertebrate Evolution.* 3<sup>rd</sup> Meeting of the Pan-American Society for Evolutionary Developmental Biology, Miami, FL
- 2019 *Gene regulatory evolution in fishes in relation to vertebrate biodiversity.* Am. Society for Biochemistry and Molecular Biology Special Symposium: Evolution and Core Processes in Gene Expression, East Lansing, MI •
- 2018 *Fresh insights from old fish: 'Ancient fishes' illuminate the genomic basis of vertebrate evolution, development and disease.* Japanese Zebrafish and Medaka Meeting, Nagoya, Japan • *International Keynote Speaker*
- 2018 *Life in technicolor: Evolution of pigmentary pathways in vertebrates.* Euro Evo Devo 2018, Galway, Ireland •
- 2017 *Ancient fish genomes illuminate vertebrate genome and gene regulatory evolution.* Am. Society for Biochemistry and Molecular Biology Special Symposium: Evolution and Core Processes in Gene Expression, Kansas City, MO
- 2017 *The spotted gar genome links biomedical fish models to human biology.* 8<sup>th</sup> Aquatic Animal Models for Human Disease Conference, Birmingham, AL
- 2016 *Fresh Insights from an Old Fish: Spotted Gar Illuminates the Genomic Basis of Vertebrate Evolution and Development.* NSF Beacon Center Congress, East Lansing, MI
- 2015 *The spotted gar genome links biomedical fish models to human biology.* Genomics in Action, Eugene, OR •
- 2015 *Spotted gar: Darwin's "Living Fossil" as a new model to study the genomic basis of vertebrate evolution and development.* Aquaculture America 2015, New Orleans, LA •
- 2015 *Sequencing the spotted gar provides connectivity among vertebrate genomes and insights into evolution by genome duplication in fish.* Plant and Animal Genome XXIII Conference, San Diego, CA •
- 2014 *A user's perspective on next generation genome annotation: the example of the spotted gar.* 7<sup>th</sup> Aquatic Animal Models of Human Disease Conference, Austin, TX •
- 2014 *Darwin's "Living Fossil" as a new model: Spotted Gar and the genomic basis of vertebrate Evo-Devo.* 5<sup>th</sup> Meeting of the European Society for Evolutionary Developmental Biology, Vienna, Austria
- 2014 *New insights from an old fish: The spotted gar provides connectivity among vertebrate genomes and uncovers evolutionary novelties after the teleost genome duplication.* Volkswagen Foundation Status Symposium – The Evolution of German Evolutionary Biology, Hannover, Germany
- 2014 *Less is more: Are gene function losses a driving force of vertebrate evolution?* EVO-WIBO Meeting 2014, Port Townsend, WA
- 2014 *Fresh insights from an old fish: Spotted gar connects vertebrate genomes and links teleost to human biology.* Northwest Regional Society of Developmental Biology Conference, Friday Harbor, WA
- 2013 *Zebrafish connects to human biology through the spotted gar genome.* 8<sup>th</sup> European Zebrafish Meeting, Barcelona, Spain •
- 2013 *Spotted gar provides connectivity among vertebrate genomes and links teleost to human biology.* 6<sup>th</sup> Aquatic Animal Models of Human Disease Conference, Milwaukee, WI •
- 2012 *Emergence of new cis-regulatory modules in fish and their role in the evolution of innovation after genome duplication.* 1<sup>st</sup> Joint Congress in Evolutionary Biology, Ottawa, Canada
- 2012 *Emergence of new cis-regulatory modules in fish and their role in the evolution of innovation after genome duplication.* Society of Molecular Biology & Evolution Meeting, Dublin, Ireland
- 2010 *Pigmentation pathway evolution after genome duplication in fish.* Evolution 2010, Portland, WA
- 2008 *Evolutionary developmental genomics of pigmentation pathways in fish.* Society of Molecular Biology & Evolution Meeting, Barcelona, Spain

## Posters

- 2018 *Of Fish and Men: What 'ancient fishes' can tell us about the genomic basis of our evolution, development, and diseases.* 9<sup>th</sup> Aquatic Animal Models for Human Disease Conference, Woods Hole, MA
- 2018 *Ancient fishes illuminate vertebrate evolution and connect zebrafish to human biology.* 13<sup>th</sup> International Zebrafish Conference, Madison, WI
- 2017 *Ancient fishes illuminate the genomic basis of vertebrate Evo-Devo.* 2<sup>nd</sup> Meeting of the Pan-American Society for Evolutionary Developmental Biology, Calgary, Canada
- 2017 *The spotted gar genome links biomedical fish models to human biology.* 8<sup>th</sup> Aquatic Animal Models for Human Disease Conference, Birmingham, AL
- 2015 *Fresh insights from an old fish: spotted gar illuminates the genomic basis of vertebrate evo-devo.* 1<sup>st</sup> Meeting of the Pan-American Society of Evolutionary Developmental Biology, Berkeley, CA
- 2014 *Using the spotted gar genome to infer the ancestry of vertebrate gene functions.* Society of Molecular Biology & Evolution Meeting, San Juan, Puerto Rico
- 2012 *Emergence of new cis-regulatory modules in fish and their role in the evolution of innovation after genome duplication.* The Future of Evo-Devo, Portland, WA
- 2011 *Emergence of new cis-regulatory modules in fish and their role in the evolution of innovation after genome duplication.* Volkswagen Foundation Status Symposium - Evolution at the Sea, Sylt, Germany
- 2007 *Evolution of pigmentation pathways by gene and genome duplication in fish.* ESEB Meeting, Uppsala, Sweden
- 2006 *Evolution of pigmentation pathways by gene and genome duplication in fish.* 1<sup>st</sup> Meeting of the European Society for Evolutionary Developmental Biology, Prague, Czech Republic
- 2005 *Comparative genomic investigation of the *pdgfrb-csf1r* locus in cichlid and other teleost fishes and its implications for the evolution of teleost coloration.* ESEB Meeting, Krakow, Poland
- 2005 *Expression and adaptive evolution of the receptor tyrosine kinase *csf1ra* in egg-mimicking color patterns of East African cichlid fishes.* 4<sup>th</sup> European Zebrafish Meeting, Dresden, Germany
- 2005 *Evolution of pigmentation by gene and genome duplication in fish.* 4<sup>th</sup> European Zebrafish Meeting, Dresden
- 2004 *Genome evolution of cichlid fishes – insights from receptor tyrosine kinases.* Genomes & Evolution 2004 (SMBE/AGA meeting), Pennsylvania State University, PA

## Invited Seminars

- 2020 Boston College, Department of Biology. Boston, MA
- 2020 Zoological Research Museum Alexander Koenig - Leibniz Institute for Animal Biodiversity. Bonn, Germany (deferred due to COVID)
- 2020 University at Buffalo, Department of Biological Sciences. Buffalo, NY
- 2019 University of Akron, Integrated Bioscience. Akron, OH
- 2019 University of Illinois at Urbana-Champaign, Program in Ecology, Evolution & Conservation Biology
- 2019 University of Denver, Department of Biological Sciences. Denver, CO
- 2019 University of Oklahoma, Department of Biology. Norman, OK
- 2018 Federal University of Pará, Center for Genomics and Systems Biology. Belém, Brazil
- 2018 Michigan State University, [Board of Trustees Meeting](#)
- 2018 Tohoku University, Graduate School of Agricultural Science. Sendai, Japan
- 2017 Western Michigan University, Department of Biological Sciences. Kalamazoo, MI
- 2017 Michigan State University, Ecology, Evolutionary Biology, and Behavior (EEBB) Program
- 2016 Michigan State University, Genetics Program
- 2016 Michigan State University, Kellogg Biological Station
- 2015 University of Washington, Department of Biology. Seattle, WA
- 2015 University of Basel, Department of Environmental Sciences. Basel, Switzerland
- 2015 Michigan State University, Department of Zoology. East Lansing, MI
- 2013 University of Chicago, Department of Organismal Biology and Anatomy. Chicago, IL
- 2009 Fred Hutchinson Cancer Research Center, Basic Science Division. Seattle, WA
- 2009 University of Oregon, Institute of Neuroscience. Eugene, OR
- 2008 University of Basel, Institute of Zoology. Basel, Switzerland

- 2004 University of Cologne, Institute of Genetics. Cologne, Germany  
 2004 University of Würzburg, Department of Physiological Chemistry. Würzburg, Germany

## EXTERNAL FUNDING

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- 2020-2024 NSF EDGE FGT# 2029216 - *Functional Genomics in Gar: Discovery Tools for Major Vertebrate Transitions*  
 PI: Ingo Braasch; Co-PIs Allyse Ferrara, Solomon David (Nicholls State University) \$ 1,621,900
- 2018-2020 NSF BEACON#1284 - *Genome duplications and their effect on brain complexity and its rapid diversification*  
 Co-PIs: Ingo Braasch, Julia Ganz, Arend Hintze \$83,000
- 2018-2020 NSF BEACON#1233 - *Developing methods to detect functional evolutionary change in expression profiles of rapidly evolving killifishes*  
 Co-PIs: Ingo Braasch, Andrew W. Thompson, Arjun Krishnan \$82,700
- 2016-2021 NIH R01OD011116 - *Resources for Teleost Gene Duplicates and Human Disease*  
 PI: John H. Postlethwait (U Oregon); Subaward to I. Braasch \$727,300 Covered by [MSU Today](#).
- 2011-2013 Initiative Evolutionary Biology Grant, Volkswagen Foundation (Germany)  
 PI: Ingo Braasch (University of Oregon/University of Würzburg) \$201,000
- 2010-2011 Feodor Lynen Postdoctoral Fellowship from the Alexander von Humboldt Foundation (Germany) \$110,000
- 2010 Postdoctoral Fellowship from the German Exchange Service DAAD (gratefully declined)
- 2008 Grant from the German Science Foundation DFG - *Functional evolution of pigment synthesis pathways in teleost fish through gen(om)e duplication*. Co-PIs: M. Scharl, J.N. Volff, and I. Braasch \$57,500

## TEACHING AND MENTORING

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### Courses

- 2021- *Fundamental Genetics* (IBIO341, Michigan State University)
- 2019- *Comparative Animal Genomics* (IBIO890/GEN800, Michigan State University)
- 2017- *Comparative Anatomy and Biology of the Vertebrates* (IBIO328, Michigan State University)
- 2013-2015 *Genome Evolution* (lectures, Summer Program in Undergraduate Research, University of Oregon)
- 2011-2013 *Evolution of Development* (lectures and exercises for biology students, University of Oregon)
- 2011 *Bioinformatics* class term project for computer science students (University of Oregon)
- 2010-2012 *Vertebrate Evolution and Development* (lectures for biology students, University of Oregon)
- 2009-2010 *Biochemistry & Molecular Biology* (seminar series for medical students, University of Würzburg)
- 2005-2008 *Biochemistry & Molecular Biology* (Teaching Assistant, lab exercises for medical students, U Würzburg)
- 2003 *Zoological Dissection Course* for biology student (Teaching Assistant, University of Konstanz)

### Mentoring

#### Postdocs

- 2016- Dr. Andrew Thompson  
 2017 Dr. Solomon David (now: Assistant Professor TT, Nicholls State University, LA)

#### Ph.D. Students

- 2019- Olivia Fitch (MSU IBIO and EEBB Program, Michigan State University)  
 2019 Emmaline Kepp (MSU BMS/Genetics and Genome Science Program rotation)  
 2014-2017 Laura Cal Delgado (visiting PhD Student from Institute of Marine Research, Vigo, Spain; now: teacher)  
 2013 Dylan R. Farnsworth (Biochemistry PhD Program rotation, University of Oregon; now: postdoc, U Oregon)  
 2011-2012 Jason Sydes (Computer Science PhD Student, University of Oregon; now: bioinformatician, U Oregon)

#### Technicians

- 2020- Taylor Lawrence (Fish Facility Manager)  
 2019-2020 Chuhao Nie (Technical Aide)  
 2018- Camilla Peabody (Lab Manager/Research Technician)  
 2018-2020 Theresa Gunn (Fish Facility Manager; now: Fish Facility Manager, Schumer Lab, Stanford University)  
 2018 Helen Rueckert (Interim Fish Facility Manager; now: Research Technician, Ganz Lab)  
 2017- Brett Racicot (Gar Facility Manager/Research Technician)  
 2017-2018 Carrie Kozel (Fish Facility Manager; now: Sea Lamprey Research Program, Great Lakes Fishery Commission)  
 2016-2017 Gabriela Saldana de Jimenez (Fish Facility/Lab Manager; now: Research Technician, MSU IQ)

### *Undergraduates*

2020- Rachel Alcorn (Student Research Assistant, MSU IBIO)  
2020 Sophie Snow (Student Research Assistant, MSU Animal Science)  
2020 Jack Dales (Student Fish Room Assistant, MSU IBIO)  
2019- Allison Abicht (Emerging Scholar Program, MSU IBIO)  
2019- Treasure Irvin (Emerging Scholar Program, MSU IBIO)  
2019- Harrison Wojtas (Student Research Assistant, MSU IBIO)  
2019-2020 Jon Schafer (Student Fish Room Assistant, MSU IBIO)  
2019 Myles Davoll (MSU SROP Summer Student, Clemson University)  
2019 Irene Hopping (Student Fish Room Assistant, MSU IBIO; now: graduate school)  
2019 David Wojciechowski (Student Fish Room Assistant, MSU IBIO)  
2018- Cameron Bennett (Student Research Assistant, MSU Lyman-Briggs College & MSU SROP Summer Student)  
2018-2019 Fiona Brewer (Student Research Assistant, MSU Neuroscience Program)  
2018-2019 Taylor Lawrence (Student Fish Room Assistant, MSU IBIO; Fish Facility Manager, Braasch & Ganz Labs)  
2018-2019 Nick Stants (Student Research Assistant, MSU IBIO; now: industry laboratory technician, Charles River)  
2018-2019 Sean Cannon (Student Research Assistant, MSU Lyman Briggs College)  
2018 Sarah Minamyer (Student Fish Room Assistant, MSU IBIO; now: graduate school)  
2018 Halley Taddonio (Student Fish Room Assistant, MSU IBIO)  
2018 Aja Edwards (Emerging Scholar Program, MSU IBIO)  
2018 Granger Hanks (visiting Student Research Assistant, Nicholls State University)  
2017-2018 Madison Kraus (Student Research Assistant, MSU Lyman Briggs College, now: graduate school, UC Boulder)  
2017-2018 Nora Straquadine (Student Fish Room Assistant, MSU IBIO; now: graduate school, Stony Brook University)  
2017-2018 Kennedy Cogswell (Student Fish Room Assistant, MSU IBIO)  
2017-2018 Jake Wier (Student Fish Room Assistant, MSU IBIO)  
2017 Brett Racicot (Student Research Assistant, IBIO; now: Research Technician, Braasch Lab)  
2012-2014 Ryan Loker (Biology Honors Thesis, University of Oregon; now: Ph.D. student, Columbia University)  
2011 Henri Bunting, Jason Sydes (Computer Science class project, University of Oregon)  
2010-2013 Colt Hoepfner, Margo Werner, Alex Titus, and Sarah Lusk (Student Research Assistants, U Oregon)  
2005-2006 Michael Fackelmann, Christopher Untucht (Undergraduate research projects, University of Würzburg)  
2004-2005 Nicol Siegel (Student Research Assistant, University of Konstanz; now: postdoc EMBL)

### *High School Interns*

2020 Caitlyn Byrne (High School Intern, DeWitt High School)  
2019 Juliana Carey (High School Intern, DeWitt High School; now: Pharmacology student, Ferris State University)  
2019 Nick Wiesner (High School Intern, East Lansing High School; now: Biochemistry student, U Michigan)  
2018 Carleigh Robinson (High School Intern, DeWitt High School; now: Molecular Biology student, Hope College)  
2018 Molly McCarthy (High School Intern, DeWitt High School; now: Kalamazoo College)

### **Graduate Committees**

MSU IBIO/EEBB Olivia Fitch (PhD, chair), Mauricio Losilla (PhD), Lauren Koenig (PhD), Seth Smith (PhD), Samantha Westcott (PhD), Acacia Ackles (PhD), Kevin McCormick (PhD), Brielle Dominguez (MS)

MSU BMS/CMB Robin Seay (PhD)

MSU EES Ryan McKeeby (PhD)

External Peyton Blount (PhD, Indiana State University)

## **PROFESSIONAL SERVICE AND ACTIVITIES**

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### **Conference Organization**

2021 Co-organizer: 10<sup>th</sup> Aquatic Animal Models for Human Disease Conference, Marine Biological Laboratory, Woods Hole  
2019 Co-organizer: ASBMB Special Symposium – Evolution and Core Processes in Gene Expression, East Lansing, MI  
2014 Session Co-Organizer: 5<sup>th</sup> European Society for Evolutionary Developmental Biology Meeting, Vienna, Austria  
2014 Session Co-Organizer: Society for Molecular Biology & Evolution Meeting (SMBE2014), San Juan, Puerto Rico  
2014 Session Chair: EVO-WIBO Meeting 2014, Port Townsend, WA  
2013 Session Chair: 8<sup>th</sup> European Zebrafish Meeting, Barcelona, Spain  
2012 Session Chair: 1<sup>st</sup> Joint Congress in Evolutionary Biology, Ottawa, Canada

### **Editorial Service**

Editorial Board Member: *Journal of Experimental Zoology B: Molecular and Developmental Evolution* (since 2018)



Associate Editor: *Gene* 2013-2016

Review Editorial Board: *Frontiers in Evolutionary and Population Genetics* (since 2011)

Guest Editor: *Journal of Experimental Zoology B: Molecular and Developmental Evolution*; Special Issue: *The Spotted Gar Genome & Vertebrate Evolution* (November 2017, Volume 328, Issue 7)

### **Reviewing Service**

Funding Agencies: *National Science Foundation, Swiss National Science Foundation, Israel Science Foundation, KAUST Saudi Arabia*

Journals: *BMC Evolutionary Biology, BMC Genomics, Comparative Biochemistry and Physiology C, Current Biology, Current Molecular Medicine, Developmental Biology, Fish and Fisheries, Frontiers in Endocrinology, Frontiers in Genetics, Gene, Gene Expression Patterns, Genome Biology, Genome Biology and Evolution, Genome Dynamics, Genome Research, GigaScience, G3: Genes/Genomes/Genetics, Heredity, International Journal of Evolutionary Biology, Journal of Experimental Zoology B: Molecular and Developmental Evolution, Journal of Fish Biology, Molecular and Cellular Endocrinology, Molecular Biology and Evolution, Molecular Ecology Resources, Nature, Nature Genetics, Nature Ecology & Evolution, Nature Communications, PeerJ, Philosophical Transactions of the Royal Society B: Biological Sciences, Physiological Genomics, Pigment Cell and Melanoma Research, PLoS Biology, PLoS One, PNAS, Proceedings of the Royal Society B: Biological Sciences, Science Advances, Scientific Reports*

### **UNIVERSITY COMMITTEE SERVICE**

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- 2016- MSU Graduate Committees (details above)
- 2017- MSU BioMolecular Science Graduate Program (evaluation and interview of applicants)
- 2017 MSU CMSE Bioinformatics Coordinator Search (evaluation of applicants)
- 2018 MSU IBIO Strategic Hiring Committee
- 2018 MSU EEBB Evolution Curriculum Committee (chair)
- 2018 MSU CNS Recruiting Fellowship Nomination Evaluations
- 2018- MSU IBIO Seminar Committee (chair 2020)
- 2018- MSU EEBB Seminar Committee
- 2019 MSU IBIO Strategic Plan Committee
- 2020- MSU IBO Chair Search Committee

### **PROFESSIONAL MEMBERSHIPS**

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Pan-American Society for Evolutionary Developmental Biology	Society for Molecular Biology and Evolution (SMBE)
European Society for Evolutionary Developmental Biology (EED)	Society for Developmental Biology (SDB)
Society for Integrative & Comparative Biology (SICB)	International Zebrafish Society (IZFS)
European Society for Evolutionary Biology (ESEB)	Society for the Study of Evolution (SSE)
Alexander von Humboldt Network	