
Curriculum Vitae of Nicolas David Rohner

Professional Experience and Positions

- 2015-present Assistant Investigator, Stowers Institute for Medical Research, Kansas City, MO
- 2015-present Assistant Professor, Department of Molecular & Integrative Physiology, KU Medical Center, Kansas City, KS
- 2010-2015 Postdoctoral Fellow, Department of Genetics, Harvard Medical School, Boston, MA

Education

- Postdoc 2010-2015 Department of Genetics, Harvard Medical School, Boston, MA
Advisor: Dr. Cliff Tabin
- Ph.D. 2010 Department of Genetics, Max-Planck-Institute for Developmental Biology, Tübingen, Germany
Advisor: Dr. Christiane Nüsslein-Volhard
Ph.D. Grade: “magna cum laude”
- M.Sc. 2005 Department of Genetics, Friedrich-Alexander University Erlangen, Germany
Advisor: Dr. Georg Fey
Grade: 1.2 (1.0 - 6.0; 1.0 is best)
- B.Sc. 2002 Friedrich-Alexander University Erlangen, Germany
Grade: 1.2 (1.0 – 6.0; 1.0 is best)

Research Interest

My research interest focuses on the interface of developmental biology, genetics and evolution with an interest on understanding the genetic basis and molecular mechanisms of adaptation to novel and extreme environments. I am mostly using the cavefish *Astyanax mexicanus* to address the question of how these fish had to change their metabolism to survive in the nutrient poor cave environment and how they are able to stay healthy despite phenotypes that would be considered pathological in humans.

Research Support

Current

Institutional Funding, Stowers Institute (09/01/2015 - 08/31/2021)	\$403,342 annual direct \$115,000 annual core
NIH 1R01GM127872-01 (co-PI) (05/15/2018 – 05/14/2022)	\$200,000
Edward Mallinckrodt, Jr. Foundation Grant (2019-2021)	\$180,000
Juvenile Diabetes Research Foundation (05/2019-04/2021)	\$300,000

Pending

NSF EDGE grant	\$150,000
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Honors and Fellowships

2014	EMBO Travel and Meeting Award to attend the FEBS EMBO 2014 Meeting in Paris
2014	Young Investigator Travel Award for the SMBE (Society for Molecular Biology & Evolution) Meeting in Puerto Rico
2014	Selected Speaker Prize at the Harvard Medical School Department of Genetics Retreat
2011-2013	Two-year Postdoctoral Fellowship from the German Government (Deutsche Forschungsgemeinschaft- DFG)
2012	Postdoc Research Day Poster Award at Harvard Medical School in recognition of outstanding poster presentation
2012	Elected for the AAAS Program for Excellence in Science
2011	Stipend from the GSO (German Scholars Organization) to travel to Germany and meet the Federal President of the Federal Republic of Germany
2005-2008	Max-Planck Ph.D. Fellowship

2006 Student award for the best poster presentation at the 1st European Meeting of Evolution and Development, Prague

Seminars and Invited Talks

Invited Departmental Seminars

2020 Department of Cell, Developmental, and Regenerative Biology at the Icahn School of Medicine at Mount Sinai, NYC

2020 Barbara Davis Center (BDC) for Diabetes in Denver, Colorado (invited by graduate students)

2019 Sars International Centre for Marine Molecular Biology, Bergen Norway (invited by postdocs)

2019 Institute for Neuro- and Behavioral Biology, University of Muenster, Germany

2019 Department of Pharmacology, Toxicology & Therapeutics, University of Kansas Medical Center, Kansas City, KS

2018 University of Cincinnati, Department of Biological Sciences, Cincinnati OH

2018 University of Wisconsin-Madison, Laboratory of Genetics, Madison WI

2018 George Washington University, Department of Biological Sciences, Washington DC

2018 CMCB Rising Star Seminar Series, Dresden, Germany (invited by postdocs)

2018 Institute of Molecular Life Sciences, University of Zurich

2018 UMKC School of Dentistry Department of Oral and Craniofacial sciences

2017 Carnegie Institution for Science, Washington DC

2017 Institut Pasteur, Department of Developmental & Stem Cell Biology, Paris, France

2017 Iowa State University, Genetics, Development, and Cell Biology Department, Ames, IA

2016 Florida Atlantic University, Department of Biological Sciences, Jupiter, FL

2016 Max-Planck-Institute for Heart and Lung Research, Bad Nauheim, Germany

2015 Kansas University Medical Center, Department of Molecular & Integrative Physiology, Kansas City, KS

Invited Plenary Presentations

- 2019 EMBO Workshop: Beyond the standard: non-model vertebrates in biomedicine, Berlin, Germany
- 2019 78th Society for Developmental Biology Meeting in Boston
- 2019 Developmental Biology Gordon Research Conference, Mt. Holyoke College, Massachusetts
- 2018 1st AsiaEvo Conference, Shenzhen, China
- 2017 Alumnus Speaker Ph.D. Symposium Max-Planck-Institute, Tuebingen
- 2017 10th meeting of the Zebrafish Disease Models Society, San Diego, CA
- 2017 ASBMB special symposium on Evolution and Core Processes in Gene Regulation, Kansas City, MO
- 2017 8th Aquatic Models of Human Disease Conference. Birmingham, AL
- 2016 American Century Championship. Edgewood Tahoe South, NV
- 2016 Harvard's 17th Annual Postgraduate Nutrition Symposium. Boston, MA
- 2016 MBL Embryology course. Woods Hole, MA
- 2015 Epigenomics & Metabolomics Symposia. Cambridge, MA
- 2014 Harvard-LMU Young Scientists' Forum. Cambridge, MA

Selected from abstract submissions (oral)

- 2018 Evolution 2018, Montpellier, France
- 2018 SMBE 2018, Yokohama, Japan
- 2018 7th Euro Evo-Devo, Galway, Ireland
- 2017 Evolution 2017, Portland, OR
- 2016 Ecological Genomics Symposium, Kansas City, MO
- 2016 20th Evolutionary Biology Meeting, Marseille, France
- 2016 SDB 75th Annual Meeting, Boston, MA
- 2016 12th International Conference on Zebrafish Development and Genetics, Orlando, FL
- 2016 International Society for Evolution, Medicine and Public Health Meeting, Durham, NC
- 2016 International conference on Subterranean Biology, Fayetteville, AR
- 2015 4th Astyanax International Meeting, Santiago de Querétaro, Mexico
- 2015 15th ESEB Meeting, Lausanne, Switzerland
- 2014 Society for Molecular Biology & Evolution Annual Meeting, San Juan, Puerto Rico

2014	Cell Symposia Evolution of Modern Humans, Sitges, Spain
2013	36 th meeting of the Society of Craniofacial Genetics and Developmental Biology, Boston, MA
2013	EMBL SYMPOSIUM: New model systems for linking evolution and ecology, Heidelberg, Germany
2013	3 rd Astyanax International Meeting, Ciudad Valles, Mexico
2011	2 nd Astyanax International Meeting, Ciudad Valles, Mexico
2007	5th European Zebrafish Genetics and Development Meeting, Amsterdam, Netherlands

Selected from abstract submissions (poster)

2019	8th Strategic Conference of Zebrafish Investigators, Pacific Grove, CA
2017	EvoDevo PAN-AM. 2nd Biennial Meeting, Calgary, Canada
2017	American Diabetes Association. 77th Scientific Sessions, San Diego, CA
2017	KU Diabetes Institute Research Symposium
2016	7 th EMBO Meeting, Mannheim, Germany
2016	Wellcome Trust Evolutionary Systems Biology Meeting, Hinxton, UK
2015	Ecological and Evolutionary Genomics Gordon Conference, Biddeford, ME
2014	EMBO-FEBS Meeting, Paris, France
2013	Biological Mechanism in Evolution - Gordon conference, Easton, MA
2012	4 th EMBO-Meeting, Nice, France
2012	First Joint Congress on Evolutionary Biology, Ottawa, Canada
2009	16 th International Society of Developmental Biologists Congress, Edinburgh, Scotland
2008	67 th Annual Meeting of the Society for Developmental Biology, Philadelphia, PA
2006	1 st European Meeting of Evolution and Development, Prague, Czech Republic

Service and Committees

2019-21	Member of the Stowers Institute Institutional Animal Care and Use Committee (IACUC)
2018	Co-Editor for <i>Developmental Biology</i> special issue on cavefish
2017-18	Member Accreditation Criterion Group, Stowers Graduate School

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- 2017 Ad-hoc Reviewer for the Emmy Noether Program (DFG)
- 2017 Organizer 5th cavefish meeting in Santiago de Querétaro, Mexico
- 2017-18 Ad-hoc Reviewer for The Research Foundation – Flanders (FWO)
- 2016-18 Member Stowers Graduate School search committee
- 2016 Poster judge at the SDB 75th Annual Meeting, Boston, MA
- 2015-present Implementation and maintenance of the community cavefish website: www.cavefin.org
- 2015 Ad-hoc Reviewer for the German science foundation (DFG)
- 2014-present Reviewer for numerous papers in the following journals:
Nature Ecology & Evolution, Nature Communications, PNAS, Science Advances, eLife, Current Biology, Cell Reports, Development, Developmental Biology, Scientific Reports, G3, Molecular Biology and Evolution, Molecular Ecology, BMC Biology, BMC Evolutionary Biology, Proceedings B, Evolution and Development, Genome Biology and Evolution, Journal of Molecular Evolution, American Journal of Physiology, Aquatic Conservation Marine and Freshwater Ecosystems, Communications, Environmental Biology of Fishes, Frontiers in Zoology, Integrative Zoology, JoVE, JEZ Part B, PLOS ONE. (<https://publons.com/home/>)
- 2010-present Member of the following societies for at least one year: Society for Molecular Biology and Evolution, European Society for Evolutionary Biology, Society for the Study of Evolution, International Society for Evolution, Medicine & Public Health, American Diabetes Association, Genetics Society of America, Society for Developmental Biology, Euro-Evo-Devo Society.

Teaching Experience and Outreach

- 2019 Presentation for a special Darwin-themed Nerd-Nite (a lay audience seminar series on various academic and pop cultural topics), Linda Hall Library, Kansas City
- 2018 Evo-Devo 80-hour module for the Stowers Graduate School Program (co-taught with Dr. Matt Gibson and Dr. Alejandro Sánchez Alvarado)
- 2017 Evo-Devo 40-hour module for the Stowers Graduate School Program
- 2016 Guest lecture for the developmental biology module of the Stowers Graduate School Program
- 2016 Evo-Devo 40-hour module for the Stowers Graduate School Program

2016	Lunch and Learn Lecture, Stowers Institute for Medical Research, Kansas City, MO
2015	Evo-Devo 40-hour module for the Stowers Graduate School Program
2014	Guest Lecture, Human Evolutionary Biology Department, Peabody Museum Cambridge, Harvard, MA
2012	Teaching Assistant position at Boston College for the Fall course: „Investigations in Molecular Cell Biology“
2012	Two-day teaching training and workshop at Boston College about Bloom’s Taxonomy of educational objectives
2011-2014	Mentoring in the Four Directions Summer Research Program at Harvard Medical School and Brigham and Women’s Hospital for undergraduate students with a commitment to the health of Native American communities (Students: Zack MacDonald, Clifford Jacobs, Jennifer Meylor, and Sean Gay)
2009	Co-teaching „Entwicklungsgenetik der Tiere (Developmental Genetics of Animals)“ with Prof Dr. Reuter, University of Tübingen

List of All Students

Postdoctoral Research Associates

2016-present	Robert Peuss
2015-present	Jaya Krishnan

Graduate students

2016-present	Shaolei Xiong
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Graduate student advising

Dissertation Advisory Committees (DAC)

Karla Terrazas
 Shuonan He
 Kyle Patton
 Augusto Ortega Granillo
 Ruohan Zhong

Rotation students

Emma Moore

Sharien Fitriarsi
Khyati Dalal
Hui Qian
Augusto Ortega Granillo
Kyle Patton
Kevin Ramos

Undergraduate Researchers

2018 Teddy Thum
2018 Luisa Felgines
2018 Janice Miller
2017 Alice Bedois
2017 Aubrey Kent
2017 Emily Orr
2016 Abagael Sykes
2016 Rebecca Richmond-Smith
2016 Jennifer Rutkowski
2011-2013 Tam Luong

Field Trips

2017 Caving trip to Pachón and Subterráneo, Sierra del Abra, Mexico
2016 Caving trip to Caballo Moro, Sierra de Guatemala, Mexico
2013 Caving trip to Subterráneo, Sierra del Abra, Mexico
2011 Caving trip to Tinaja, Sierra del Abra, Mexico
2007 Field trip to collect Phoxinellus species, Croatia and Bosnia Herzegovina

Publications (in reverse chronological order)

Total - 1793 citations, h-index 12, i10-index 13
Since 2014 - 1580 citations, h-index 12, i10-index 12

24. Stahl BA, Peuss R, McDole B, Kenzior A, Jaggard JB, Gaudenz K, Krishnan J, McGaugh SE, Duboue ER, Alex C. Keene AC, and Rohner N. *Stable transgenesis in Astyanax mexicanus using the Tol2 transposase system. Dev Dyn.* 2019 Apr 2. [Epub ahead of print]

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23. Rohner N. *Evolution: A dark past*. *Current Biology* 2018 Oct 22;28(20):R1190-R1192).
22. Krishnan J, Rohner N. *Sweet Fish. Fish Models for the Study of Hyperglycemia and Diabetes*. *J Diabetes* 2018 Sep 28. [Epub ahead of print]
21. Herman A, Brandvain Y, Weagley J, Jeffery WR, Keene AC, Kono TJY, Bilandžija H, Borowsky R, Espinasa L, O'Quin K, Ornelas-García CP, Yoshizawa M, Carlson B, Maldonado E, Gross JB, Cartwright RA, Rohner N, Warren WC, McGaugh SE. *The role of gene flow in rapid and repeated evolution of cave related traits in Mexican tetra, Astyanax mexicanus*. *Mol Ecol*. 2018 Sep 25. [Epub ahead of print]
20. Gore AV, Rohner N, Rétaux S, Jeffery WR. *Seeing a bright future for a blind fish*. *Dev Biol*. 2018 Sep 15;441(2):207-208.
19. Xiong S, Krishnan J, Peuß R, and Rohner N. *Early adipogenesis contributes to excess fat accumulation in cave populations of Astyanax mexicanus*. *Dev Biol*. 2018 Sep 15;441(2):297-304. Epub 2018 Jun 5.
18. Tabin JA, Aspiras A, Martineau B, Riddle M, Kowalko J, Borowsky R, Rohner N*, Tabin CJ*. *Temperature preference of cave and surface populations of Astyanax mexicanus*. *Dev Biol*. 2018 Sep 15;441(2):338-344. Epub 2018 Apr 25. * corresponding authors
17. Rohner N. Cavefish as an evolutionary mutant model system for human disease. *Dev Biol*. 2018 Sep 15;441(2):355-357. Epub 2018 Apr 22
16. Riddle M, Aspiras A, Gaudenz K, Peuß R, Sung J, Martineau B, Peavey M, Box AC, Tabin JA, McGaugh SE, Borowsky R, Tabin CJ* and Rohner N*. *Insulin resistance in cavefish as an adaptation to a nutrient-limited environment*. *Nature* 2018 doi:10.1038/nature26136. * corresponding authors
- From the Cover. Recommended Faculty1000. Featured as News and Views in Nature, in Nature Podcast, in National Geographic, New York Times, Harvard Press Release.*
15. Klaassen H, Wang Y, Adamski K, Rohner N, Kowalko JE. *CRISPR mutagenesis confirms the role of oca2 in melanin pigmentation in Astyanax mexicanus*. *Dev Biol*. 2018 Sep 15;441(2):313-318. Epub 2018 Mar 16.
14. Krishnan J, Rohner N. *Cavefish and the basis for eye loss*. *Philos Trans R Soc Lond B Biol Sci*. 2017 Feb 5;372(1713).

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13. Daane JM, **Rohner N**, Konstantinidis P, Djuranovic S, Harris MP. *Phylogenomic evidence for epistasis between fgfr1 and fgf20 in skeletal evolution.* *Mol Biol Evol.* 2016 Jan;33(1):162-73
 12. Aspiras A*, **Rohner N***, Martineau B, Borowsky R, Tabin CJ. *Loss of function mutations in MC4R drive adaptation of Astyanax mexicanus through hyperphagia.* *Proc Natl Acad Sci U S A* 2015 Aug 4;112(31):9668-73
* contributed equally
Featured in National Geographic, Featured on BBC Radio, Featured in the New York Times, Harvard Press Release.
 11. McGaugh SE, Gross JB, Aken B, Blin M, Borowsky RL, Chalopin D, Hinaux H, Jeffery WR, Keene AC, Ma L, Minx P, Murphy D, O'Quin KE, Rétaux S, **Rohner N**, Searle SMJ, Stahl B, Tabin C, Volf JN, Yoshizawa M, Warren WC. *The cavefish genome reveals candidate genes for eye loss.* *Nature Communications* 2014 Oct 20;5:5307.
 10. **Rohner N**, Tschopp P, Tabin CJ. *Facial Makeup Enhancing our Looks.* *Current Biology* 2014 Jan 6;24(1):R36-8
 9. **Rohner N**, Jarosz DF, Kowalko JE, Yoshizawa M, Jeffery WR, Borowsky RL, Lindquist S, Tabin CJ. *Cryptic Variation in Morphological Evolution: HSP90 as a Capacitor for the Adaptive Loss of Eyes in Cavefish.* *Science* 2013 Dec 13;342(6164):1372-5
Editors choice Science, Editors choice Nature Genetics, Featured in National Geographic, Featured in Scientific American, Harvard Press Release and Whitehead-Institute Press release
 8. Kowalko JE, **Rohner N**, Linden TA, Rompani SB, Warren WC, Borowsky R, Tabin CJ, Jeffery WR, Yoshizawa M. *Convergence in feeding posture occurs through different genetic loci in independently evolved cave populations of Astyanax mexicanus.* *Proc Natl Acad Sci U S A* 2013 Oct 15;110(42):16933-8
 7. Kowalko JE, **Rohner N**, Rompani SB, Peterson BK, Linden TA, Yoshizawa M, Kay EH, Weber J, Hoekstra HE, Jeffery WR, Borowsky R, Tabin CJ. *Loss of Schooling Behavior in Cavefish through Sight-Dependent and Sight-Independent Mechanisms.* *Current Biology* 2013 Oct 7; 23(19): 1874-83
Featured as Dispatch in Current Biology
 6. Amemiya CT, Alföldi J, Lee AP, Fan S, Philippe H, Maccallum I, Braasch I, Manousaki T, Schneider I, **Rohner N**, Organ C, Chalopin D, Smith JJ, Robinson M, Dorrington RA, Gerdol M, Aken B, Biscotti MA, Barucca M, Baurain D, Berlin

AM, Blatch GL, Buonocore F, Burmester T, Campbell MS, Canapa A, Cannon JP, Christoffels A, De Moro G, Edkins AL, Fan L, Fausto AM, Feiner N, Forconi M, Gamielien J, Gnerre S, Gnirke A, Goldstone JV, Haerty W, Hahn ME, Hesse U, Hoffmann S, Johnson J, Karchner SI, Kuraku S, Lara M, Levin JZ, Litman GW, Mauceli E, Miyake T, Mueller MG, Nelson DR, Nitsche A, Olmo E, Ota T, Pallavicini A, Panji S, Picone B, Ponting CP, Prohaska SJ, Przybylski D, Saha NR, Ravi V, Ribeiro FJ, Sauka-Spengler T, Scapigliati G, Searle SM, Sharpe T, Simakov O, Stadler PF, Stegeman JJ, Sumiyama K, Tabbaa D, Tafer H, Turner-Maier J, van Heusden P, White S, Williams L, Yandell M, Brinkmann H, Volff JN, Tabin CJ, Shubin N, Schartl M, Jaffe DB, Postlethwait JH, Venkatesh B, Di Palma F, Lander ES, Meyer A, Lindblad-Toh K. *Analysis of the African coelacanth genome sheds light on tetrapod evolution.* **Nature** 2013 Apr 18;496(7445):311-6

From the cover. Featured in BBC News, Scientific American, Harvard and Broad Press Release

5. Smith JJ, Kuraku S, Holt C, Sauka-Spengler T, Jiang N, Campbell MS, Yandell MD, Manousaki T, Meyer A, Bloom OE, Morgan JR, Buxbaum JD, Sachidanandam R, Sims C, Garruss AS, Cook M, Krumlauf R, Wiedemann LM, Sower SA, Decatur WA, Hall JA, Amemiya CT, Saha NR, Buckley KM, Rast JP, Das S, Hirano M, McCurley N, Guo P, **Rohner N**, Tabin CJ, Piccinelli P, Elgar G, Ruffier M, Aken BL, Searle SM, Muffato M, Pignatelli M, Herrero J, Jones M, Brown CT, Chung-Davidson YW, Nanlohy KG, Libants SV, Yeh CY, McCauley DW, Langeland JA, Pancer Z, Fritsch B, de Jong PJ, Zhu B, Fulton LL, Theising B, Flicek P, Bronner ME, Warren WC, Clifton SW, Wilson RK, Li W. *Sequencing of the sea lamprey (*Petromyzon marinus*) genome provides insights into vertebrate evolution.* **Nature Genetics** 2013 Apr;45(4):415-21, 421e1-2
4. Norton WH, Stumpfenhorst K, Fauss-Kessler T, Folchert A, **Rohner N**, Harris MP, Callebert J, and Bally-Cuif L. *Fgf signalling in the brain reveals a genetic basis for an aggression-boldness syndrome.* **Journal of Neuroscience** 2011 Sep 28;31(39):13796-807
3. **Rohner N**, Perathoner S, Frohnhöfer HG, Harris MP. *Enhancing the efficiency of N-ethyl-N-nitrosourea-induced mutagenesis in the zebrafish.* **Zebrafish** 2011 Sep 28;31(39):13796-807
2. **Rohner N***, Bercseny M, Orban L, Kolanczyk ME, Linke D, Brand M, Nüsslein-Volhard C, and Harris MP*. *Duplication of fgfr1 Permits Fgf Signaling to Serve*

as a Target for Selection during Domestication. **Current Biology** 2009 Oct 13;19(19):1642-7 *corresponding authors

Recommended Faculty1000, Editors choice Science, Editors choice Nature, Dispatch Current Biology, Max-Planck-Institute Press Release, Featured on National Public Radio.

1. Harris MP, **Rohner N**, Schwarz H, Perathoner S, Konstantinidis P, and Nüsslein-Volhard C. Zebrafish *eda* and *edar* mutants reveal conserved and ancestral roles of ectodysplasin signaling in vertebrates. **PLoS Genetics** 2008 Oct 3;4(10):e1000206

Book chapters (peer reviewed):

1. 'Out of the Dark' Cavefish are Entering Biomedical Research for "Zebrafish, Medaka, and Other Small Fishes - New Model Animals in Biology, Medicine, and Beyond". published by Springer science. (in press)
2. The role of genome evolution in developmental evolution for "The Encyclopedia of Evolutionary Biology" published by Elsevier. May 06 2016. ISBN: 9780128000496
3. Selection through Standing Genetic Variation in "The evolution and biology of Mexican cavefish" published by Elsevier. Oct 12 2015. ISBN: 978-0-12-802148-4

Press coverage

2018 Blind Cave Fish May Hold Secret to Treating Diabetes (**National Geographic**)

2018 The Blind Fish That Should Have Diabetes, But Somehow Doesn't (**The Atlantic**)

2018 Sweet Surprise (**Harvard Medical School News**)

2017 Blind Cave Fish Beat Back Diabetes Symptoms That Would Kill People (**Scientific American**)

2017 Q&A – A discussion with Nicolas Rohner (**Stowers Report Fall/Winter 2016**)

2016 Changes in cavefish metabolism could lead to new insights into diabetes (**News Medical Life Sciences**)

2016 Blind cave fish may provide insights into human health (**Science in Depth, by Elizabeth Pennisi**)

2016 Why Scientists Are Falling For A Blind, Albino, Binge-Eating Cavefish (**KCUR Public Radio**)

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- 2015 How can you eat, eat, eat—and stay healthy? Ask a blind cavefish. (**National Geographic**)
- 2015 Fat Fish Illuminate Human Obesity: Binge-eating cavefish share mutated gene with some obese people (**Harvard Medical School News**)
- 2015 Insatiable Fish Share Gene With Binge-Eating Humans (**New York Times**)
- 2013 Blind Cave Fish Could Change Our Understanding of Evolution (**Scientific American**)
- 2013 How A Fish Unleashed Its Evolutionary Potential And Went Blind (**National Geographic**)
- 2013 Evolution’s Fast Track: Eyeless cavefish reveal mechanisms of cryptic genetic variation (**HMS News**)