



er

Current position:

Associate professor of Physiology (part-time) at Scuola Normale Superiore (SNS), Pisa, Italy;

Additional position

Research group leader (part-time), Leibniz Institute on Aging Fritz Lipmann Institute, Jena

Electronic identifiers:

Scopus Author ID: 7004248548

ORCID: 0000-0003-3834-0097

Google Scholar: nB0ZfBgAAAAJ

Key Performance Indicators							
papers	citations	h-index	PhD students	grants	Funds raised	patents	Start-ups
128	8765*	52*	14	18	2.9 Mio €	4	1

\*Google Scholar, 25/07/2023

## Scientific Biosketch

---

I am a neurophysiologist by training with a strong research background focused on the study of neurotrophins in neural development and plasticity, primarily using the rodent visual system obtained during my PhD and postdoctoral studies. After securing a tenured position, my research trajectory shifted towards pioneering the development of the annual fish *Nothobranchius furzeri* as a novel model organism for aging research.

During the early years of my tenure, my research group extensively characterized various aging phenotypes in *N. furzeri*, demonstrating that this model accurately recapitulates key aspects of aging at cellular and behavioral levels. Additionally, we investigated the impact of non-genetic interventions on lifespan and aging marker expression, effectively showcasing the malleability of aging in this species. Furthermore, our investigation into different populations of *N. furzeri* revealed intriguing differences in lifespan evolution in response to habitat humidity, providing vital information for analyzing the *N. furzeri* genome and identifying genomic adaptations associated with lifespan.

Subsequently, the sequencing of the *N. furzeri* genome and the establishment of transgenic techniques elevated the status of this species as a game-changer for the study of adult phenotypes. As a result, a collaborative international community has emerged around *N. furzeri*, leveraging its unique attributes to test the effects of experimental manipulations on aging-associated phenotypes. Notably, scientists who were trained as graduate students in my group made significant and valuable contributions to the widespread adoption and dissemination of this model organism.

My research approach seamlessly blends experimental, genetic, and computational techniques, yielding several groundbreaking findings in the field of aging research, including:

- Identification of resveratrol as a compound capable of retarding vertebrate aging.
- Identification of complex I of the respiratory chain as a modulator of vertebrate longevity.
- Identification of the microRNA miR-29 as a key regulator controlling age-dependent processes in the vertebrate brain.
- Discovery of mechanisms underlying proteostasis collapse in the aging brain.
- Creation of a multi-tissue, multi-species transcriptomic clock.

These novel insights shed new light on the mechanisms of vertebrate aging and will continue to guide my future research endeavors and I am committed to mentor a new generation of scholars in the field of aging research.

### Independent reviews on the topic:

J. Prickel (2003) Flash in the pond. *Science* 301(5631), 305.

Wang, A.M., Promislow, D.E., and Kaeberlein, M. (2015). Fertile waters for aging research. *Cell* 160, 814-815.

Lakhina, V., and Murphy, C.T. (2015). Genome Sequencing Fishes out Longevity Genes. *Cell* 163, 1312-1313.

Callaway, E. (2015). Short-lived fish may hold clues to human ageing. *Nature* 528, 175.

Lieben, L. (2015). Fishing for the ageing secret. *Nature Reviews Genetics* 17, 69.

Dance A. (2016) Live fast, die young; *Nature* 535(7612):453-5.

Nowogrodzki, A. (2016). Short-lived fish hints at genetic secrets of longevity. *New Scientist*. Epub 24 Feb 2016

## Studies and qualifications

---

- Habilitation:  
31/12/2014: National Scientific Habilitation (Abilitazione Scientifica Nazionale) for full professor (professore di prima fascia) in Physiology (BIO-09)
- Post-graduate studies:  
20/12/1995, PhD cum laude  
Thesis: The physiological roles of the neurotrophins NGF and BDNF in the development of the visual system. Supervisor: Prof. L. Maffei, external referee: Prof. H. Thoenen (Max-Planck Institut für Psychiatrie, Martinsried, Germany)  
1994 Max-Planck Institut für Psychiatrie, Martinsried, Germany, (Prof. Y.-A. Barde), visiting student  
1992-1994 PhD student Scuola Normale Superiore, Pisa, Italy, Neurobiology
- Pre-graduate studies:  
17/10/1991 Graduation (Laurea) *cum laude* in Biology, University of Pisa
- Other:  
Qualification for project leader in animal experiments FELASA functions A,B,C,D

## Working experience

---

### Postodoc:

- 08/1995-12/1997: University of Tübingen, Forschungsstelle für experimentelle Ophthalmologie, (P.I. Dr. K. Kohler) and Max-Planck Institut für Entwicklungsbiologie (P.I. Prof. M. Bähr)
- 01.1995-06.1995: Max-Planck Institut für Psychiatrie, Martinsried, Germany, (P.I. Prof. Y.-A. Barde)

### Positions:

- 01/11/2020-present Senior Group Leader (part-time) Leibniz Institute for Age Research. Jena, Germany
- 07/2016-present Associate professor for Physiology (BIO-09), Scuola Normale Superiore, Pisa, Italy
- 01/2010-06/2016 Assistant professor for Physiology (BIO-09), Scuola Normale Superiore, Pisa, Italy
- 09/2007-11/2009: Junior Group Leader, Leibniz Institute for Age Research. Jena, Germany (On sabbatical leave from SNS)
- 07/2006-09/2007: Visiting Scientist, Leibniz Institute for Age Research. Jena, Germany (On sabbatical leave from SNS)
- 01/2000-06/2006: tenured Researcher in Physiology. Scuola Normale Superiore, Pisa, Italy.
- 01/1998-12/1999: fixed-time Researcher, CNR, Institute of Neurophysiology, Pisa, Italy

## Honours

---

- 2019: Leibniz Chair of the Leibniz Association, Germany
- 2018: Thuringen Forschungspreis for sequencing the *N. furzeri* Genome (shared with K. Reichwals, P. Koch, A. Petzold, M. Platzer, C. Englert)

- 2010: Max-Buerger Prize of the Deutsche Gesellschaft für Gerontologie und Geriatrie (German Gerontological Society) for establishing *N. furzeri* as a new model system (shared with M. Platzer and C. Englert)
- 2001: Prize “Liceo Enrico Fermi” for science writing
- 1998: Prize “Bruno Ceccarelli” for junior scientists in the Neuroscience
- 1995: Human Capital Mobility fellowship from the EU
- 1987-1991: Scholarship from Scuola Normale Superiore, Pisa

### Official roles in international events

---

- 03-04/06/2021 Leuven, member of the scientific committee 4rth International Nothobranchius Symposium. Organized by KU Leuven
- 15-16/06/2022 Potsdam, invited speaker, Workshop Extending the Health Span: Molecular Mechanisms of Cardiovascular Aging
- 03-04/06/2021 Brno (online), member of the scientific committee 4rth International Nothobranchius Symposium. Organized by the Czech Academy of Science
- 11/01/2019 Jena, invited speaker, Symposium on Microbiome and aging
- 7-9/06/2018 Cologne, invited speaker, 3rd International Nothobranchius Symposium, organized by the Max Planck Institute on Aging
- 25-28/10/2017 Groningen, selected speaker 2nd Molecular Biology of Ageing Meeting 2017
- 18-22/06/2017 Singapore, invited speaker, 18th International Congress of Developmental Biology
- 21/08/2016-25/08/2016 Lueven, invited speaker, 28th Conference of European Comparative Endocrinologists
- 13-16/06/2016 Brussel, invited speaker, Federation for Laboratory Animal Science Associations (FELASA) conference
- 02-05/06 Jena, organizer 2nd International Nothobranchius Symposium. Organized by the Leibniz Institute on Ageing
- 03-05/04/2016 Cologne, Selected speaker, 2nd Cologne Ageing Conference
- 18-20/05/2015, Hinxton (UK), selected speaker, Healthy Ageing: From Molecules to Organisms, organized by the Wellcome Trust
- 13-18/12/2014: Austin, TX, invited session chair “Seventh Aquatic Animal Models of Human Diseases Conference” organized by the Texas State University
- 27/9/2014: Frankfurt a.M., invited speaker “Symposium: Aging is it a disease?” organized by the IBSA Foundation
- 8-9/9/2014: Jena, invited speaker “Workshop on Systems Biology of Aging” organized by the Jena Center for Systems Biology of Aging
- 6-8/2/2014: Pisa, organizer “Symposium: From Bush to Bench: 10 Years of Nothobranchius furzeri as model System in Biology”. Organized by the Scuola Normale Superiore
- 10-13/08/2010: London, Keynote speaker “Young Investigator’s Workshop for members of ‘LifeSpan’ and ‘LINK-AGE’ projects”. Organized by University College London
- 9-12/6/2009: Bergen, invited speaker. “Fish models of human diseases” Summer school organized by the Sars International Centre for Marine Molecular Biology
- 29-30/05/2009 Bethesda, MA invited speaker “Workshop on Alternative Animal Models for Aging Research”. Organized by the National Institute on Aging
- 19/5/2008: Providence, RI, invited speaker. “Brown University Colloquium on the Biology of Human Aging”. Organized by the Brown University
- 13-15/04/2008 Dresden, keynote speaker “Retreat of PhD Students of the Dresden International Graduate School”. Organized by the Max Planck Institute for Molecular Cell Biology and Genetics

- 23-28/7/2006 Bregenz, invited speaker “International Symposium on Neurobiology and Neuroendocrinology of Aging” organized by the National Institute of Health

### Institutional responsibilities

---

- 2019-2020 Coordinator, PhD course in Neuroscience, Scuola Normale Superiore, Pisa
- 2018-2019 Elected member of the Scuola Normale Superiore Senate
- 2017-2020 Faculty member, PhD course in Data Science, Scuola Normale Superiore, Pisa
- 2016-2018 Faculty member, Master of Science in “Neuroscience”, University of Pisa
- 2011-present Faculty member, PhD course in Neuroscience, Scuola Normale Superiore, Pisa, Italy

### Supervision of PhD students

---

- 2023- : Davide Lorenzo Drago, Scuola Normale Superiore, Pisa. Thesis topic: Brain aging in the longest-lived vertebrate, the Greenland shark
- 2022- : Sezin Eyüpustaoglu, Scuola Normale Superiore, Pisa and Leibniz Institute on Aging, Jena. Thesis topic: Common mechanisms of diapause and brain aging
- 2022- : Roberta Camera, Scuola Normale Superiore, Pisa. Thesis topic: Evolution of neurotrophin function in basal vertebrates
- 2020 – 2023: Chiara Giannuzzi, Scuola Normale Superiore, Pisa and Leibniz Institute on Aging, Jena. Thesis topic: Multiomics longitudinal analysis of aging in *N. furzeri*.
- 2020 – 2023: Letizia Brogi, Scuola Normale Superiore, Pisa. Thesis topic: Ex-vivo aging of the *N. furzeri* brain
- 2018-2022: Elisa Ferrari (Data Science). Thesis topic: Integration of activity-based and gene-expression based connectomes in autism
- 2018-2023: Aurelia Viglione Thesis topic: MicroRNA-29 and age-dependent cognitive decay
- 2017 – 2021: Sara Bagnoli, Scuola Normale Superiore, Pisa. Thesis topic: *N. furzeri* as a model for age-related neurodegenerative diseases
- 2016 – 2020: Mariateresa Mazzetto, Scuola Normale Superiore, Pisa and Leibniz Institute on Aging, Jena. Thesis topic: Identification of evolutionary conserved processes that control aging by RNA-seq and proteomics.
- 2015 – 2019: Cinzia Caterino, Scuola Normale Superiore, Pisa and Leibniz Institute on Aging, Jena. Thesis topic: Aging effects on synaptic proteome and transcriptome.
- 2012-2015: Luca Dolfi, Scuola Normale Superiore, Pisa. Thesis topic: Investigations on diapause and cell cycle regulation in annual fishes.
- 2012-2015: Roberto Ripa, Scuola Normale Superiore, Pisa. Thesis topic: MicroRNA-29 regulates iron homeostasis during aging.
- 2009-2012: Enoch Ng’Oma, Fritz Lipmann Institute, Jena. Thesis: Identification of gene loci responsible for age-related pathologies in *Nothobranchius furzeri*.
- 2004-2006: Dario Riccardo Valenzano, Scuola Normale Superiore, Pisa. Thesis: the annual fish *Nothobranchius furzeri* as a new model system for ageing research.

### Supervision of Master students (University of Pisa)

---

- 2023: Davide Lorenzo Drago: “Comparative analysis of adult neurogenesis in cartilaginous fishes”

- 2019: Martino Ugolini. “High-throughput analysis of the synaptic transcriptome and its regulation during aging”.
- 2017: Giorgio Bianchini “Analysis of the applicability of miRNA clusters as phylogenetic markers, through the development of a method to identify the sequences that best predict a cladogram “.
- 2015: Valeria Arcucci “Micro-RNA-mediated regulation of iron homeostasis: post-transcriptional control of *ireb2* by miR-29”
- 2014: Aurora Savino “Gene expression analysis during aging of the annual fish *Nothobranchius furzeri*”
- 2013: Giorgia Battistoni “piRNAs in regeneration and diapause”.
- 2012: Chiara Priami “MicroRNAs associated with ageing induce neuronal differentiation in vivo”.

### Contribution to the early career of scientists

---

The oldest pupils and postdocs have obtained independent positions and/or funding taking advantage of their experience in using *N. furzeri* as a model:

- Dario Riccardo Valenzano: Director (from 2024) of the Leibniz Institute on Ageing, Jena.
- Mario Baumgart: project leader and recipient of a starting grant (“Erstantrag”) from the Deutsche Forschungsgemeinschaft
- Eva Terzibasi Tozzini: tenured researcher at Stazione Zoologica “Anton Dohrn”, Napoli
- Enoch Ng’Oma: assistant professor University of Missouri

Younger pupils have obtained PhD or postdoctoral positions in elite international Institutions

- Elisa Ferrari CEO QuantaBrain S.r.L., Pisa
- Sara Bagnoli, Postdoctoral Researcher Scuola Normale Superiore, Pisa.
- Mariateresa Mazzetto, Postdoctoral Researcher Yale University, USA
- Roberto Ripa, Head of fish Facility and Postdoctoral Researcher. Max Planck Institute, Cologne
- Martino Ugolini. PhD candidate University of Lausanne
- Giorgio Bianchini Research Associate university of Bristol.
- Valeria Arcucci Research Officer University of Melbourne
- Aurora Savino Postdoctoral Fellow Human Technopole, Milano
- Giorgia Battistoni Research Associate Cancer Research UK Cambridge
- Chiara Priami Postdoctoral Fellow, European Oncology Institute (IEO), Milano

### Teaching activity

---

- 2014 - present Neurogenomics (40 hours), PhD students, Scuola Normale Superiore, Pisa.
- 2014 - 2022 Module (10 hours): Evolution, 2nd semester students, Scuola Normale Superiore, Pisa
- 2011 - present Biology of aging (20 hours), Master students, Scuola Normale Superiore, Pisa

## Textbooks

---

- Chapter “Invecchiamento” (Ageing) in “Fisiologia Medica” Fiorenzo Conti editor Edi. Ermes, Milano. ISBN 978-8870513462
- Monography “Transcriptome analysis. Introduction and applications in the Neurosciences”. A. Cellerino and M. Sanguanini. Edizioni della Scuola Normale. Distributed by Springer Verlag <https://www.springer.com/gp/book/9788876426414> ISBN 978-8876426421

## Grants

---

### **Total fund raised: 2 913 000 €**

- 2023: Ministero dell’Università e Ricerca (MUR) Collaborative grant “Sharkage: evolution of longevity in sharks” national coordinator duration 24 months 80 000 €
- 2023: Deutsche Forschungs Gemeinschaft (DFG) “Phenotypic and molecular correlates of the parallel evolution of lifespan and diapause in killifishes” duration 36 months 263 350 €
- 2022: Ministero dell’Università e Ricerca (MUR) Large collaborative project “Tuscany Health Ecosystem”, head of a research unit duration 36 months 89 000 €
- 2022: Deutsche Forschungs Gemeinschaft (DFG) “Multidimensional longitudinal study of lifespan predictors in the short-lived killifish *Nothobranchius furzeri*” duration 36 months 384 660 € + 144 904 € (sequencing costs)
- 2021: Ministero dell’Università e Ricerca (MUR) Large collaborative project “PRO3”, head of a research unit duration 36 months 64 000 €
- 2020: Regione Toscana: Collaborative project “Innate Immune response in demented patients” duration 36 months, head of a research unit 130 000 €
- 2017: Fondazione Pisa: Collaborative project “Engineered theranostics for heart and brain ageing”, head of a research unit 100 000€
- 2017: SNS intramural grants: „Functional study of protein variants evolved in association with short lifespan “duration 24 months 56 000 €
- 2015: Deutsche Forschungs Gemeinschaft (DFG) “Functional study of novel genes in adult neurogenesis in the annual fish *Nothobranchius furzeri*” co-PI duration 36 months 407 800 €
- 2015: SNS intramural grants: „Genomic substrates for evolution of aging in annual fishes“ duration 24 months 56 000 €
- 2014: Research agreement with Actial Farmaceutica SA duration 18 months 20 000 €
- 2013: SNS intramural grants: „Impact of miRNA-mediated translational inhibition on gene regulatory networks in embryonic and adult neurogenesis“ 24 months 48 000 €
- 2012: SNS intramural grants: „A molecular study of diapause in annual fish“ duration 12 months 25 000 €
- 2011: SNS intramural grants: „Functional analysis of brain microRNAs dysregulated during aging“ duration 12 months 25 000 €
- 2011: ANR (Agence National de la Recherche) „Ageing and functional integrity: modulation by Lifeextending treatments in a Vertebrate model with extremely short lifespan (ALIVE)“ (subcontractor) duration 24 months 25 000 €
- 2009: BMBF (Bundes Ministerium für Bildung und Forschung), GerontoSys „JenAge systems biology of mild stress and healthy ageing, a multispecies approach“ duration 60 months 655 000 €
- 2007: DFG (Deutsche Forschung Gemeinschaft) „Role of SIRT1 and TOR in regulation of vertebrate longevity“ duration 36 months 269 000 €

- 2003: FIRB 2001 „development on non-viral transfection techniques in the retina“ duration: 36 months 71 000 €

## Patents

---

- 2023: A METHOD TO PREDICT LIFESPAN AND HEALTHSPAN co-inventor E. Ferrari PCT/EP2023/069608
- 2022: A METHOD FOR ANALYSIS OF IMAGES OF FUNCTIONAL RESONANCE co-inventors E. Ferrari, D. Bacciu, A. Retico PCT/EP 2023/057150.
- 2006: USE OF NOTHOBRANCHIUS FURZERI AS A MODEL SYSTEM FOR THE CHARACTERIZATION OF GENES THAT CONTROL AGEING PCT/IT2006/000238
- 2005: USE OF NOTHOBRANCHIUS FURZERI AS A MODEL SYSTEM FOR THE CHARACTERIZATION OF DRUGS THAT CONTROL AGEING PCT/IT2005/000753

## Start-ups

---

- 2023: Quantabrain S.r.l. Pisa. Co-founders: E. Ferrari, A. Cellerino, D. Bacciu, A. Retico, H. Teichmann Prisco. Funded via SAFE cap value 3 Mio €

The objective of QuantaBrain (Quantitative Analysis of Brain) is to improve the diagnosis process of psychiatric disorders using quantitative criteria by applying artificial intelligence algorithms to brain imaging data.

## Publications

---

### Ten Selected publications

1. Mazzetto M, Caterino C, Groth M, Ferrari E, Reichard M, Baumgart M, **A Cellerino**, RNAseq Analysis of Brain Aging in Wild Specimens of Short-Lived Turquoise Killifish: Commonalities and Differences With Aging Under Laboratory Conditions. *Mol Biol Evol.* 2022 39(11):msac219 IF = 10.7 # citations = 3<sup>a</sup>
2. Kelmer Sacramento E, Kirkpatrick JM, Mazzetto M, Baumgart M, Bartolome A, Di Sanzo S, Caterino C, Sanguanini M, Papaevgeniou N, Lefaki M, Childs D, Bagnoli S, Terzibasi Tozzini E, Di Fraia D, Romanov N, Sudmant PH, Huber W, Chondrogianni N, Vendruscolo M, **Cellerino A\***, Ori A\*. Reduced proteasome activity in the aging brain results in ribosome stoichiometry loss and aggregation. *Mol Syst Biol.* 2020 16(6):e9596. \* = co-senior authors IF = 9.9 # citations = 109<sup>a</sup>
3. Ripa R, Dolfi L, Terrigno M, Pandolfini L, Savino A, Arcucci V, Groth M, Terzibasi Tozzini E, Baumgart M, **A. Cellerino**, MicroRNA miR-29 controls a compensatory response to limit neuronal iron accumulation during adult life and aging. *BMC Biology*, 2017 15: p. 9 reviewed in Nature (Live fast die young, Nature 535, 453–455) IF = 5.4 # citations = 82<sup>a</sup>



4. Baumgart, M., S. Priebe, M. Groth, N. Hartmann, U. Menzel, L. Pandolfini, P. Koch, M. Felder, M. Ristow, C. Englert, R. Guthke, M. Platzer, and **A. Cellerino**, Longitudinal RNA-Seq analysis of vertebrate aging identifies mitochondrial complex I as a small-molecule-sensitive modifier of lifespan. *Cell Systems*, 2016. 2(2): p. 122-132 reviewed in *New Scientist*, *Nature* IF = 9.2 # citations = 126<sup>a</sup>
5. Reichwald, K., A. Petzold, P. Koch, B.R. Downie, N. Hartmann, S. Pietsch, M. Baumgart, D. Chalopin, M. Felder, M. Bens, A. Sahm, K. Szafranski, S. Taudien, M. Groth, I. Arisi, A. Weise, S.S. Bhatt, V. Sharma, J.M. Kraus, F. Schmid, S. Priebe, T. Liehr, M. Grolach, M.E. Than, M. Hiller, H.A. Kestler, J.N. Volf, M. Schartl, **A. Cellerino\***, C. Englert\*, and M. Platzer\*, Insights into Sex Chromosome Evolution and Aging from the Genome of a Short-Lived Fish. *Cell*, 2015. 163(6): p. 1527-38. \* =co-last authors. reviewed in *Cell*, *Nature*, *Nature Genetics* IF = 64 # citations = 254<sup>a</sup>
6. Baumgart, M., M. Groth, S. Priebe, A. Savino, G. Testa, A. Dix, R. Ripa, F. Spallotta, C. Gaetano, M. Ori, E. Terzibasi Tozzini, R. Guthke, M. Platzer, **A. Cellerino** RNA-seq of the aging brain in the short-lived fish *N. furzeri* - conserved pathways and novel genes associated with neurogenesis. *Aging Cell*, 2014 13(6):965-74 IF = 7,8 # citations = 140<sup>aa</sup>
7. Tozzini, E.T., M. Baumgart, G. Battistoni, and **A. Cellerino**, Adult neurogenesis in the short-lived teleost *Nothobranchius furzeri*: localization of neurogenic niches, molecular characterization and effects of aging. *Aging Cell*, 2012. 11(2): p. 241-51. Recommended by F1000 Prime IF = 7,8 # citations = 123<sup>a</sup>
8. Terzibasi E, Lefrançois C, Domenici P, Hartmann N, Graf M, **Cellerino A.**, Effects of dietary restriction on mortality and age-related phenotypes in the short-lived fish *Nothobranchius furzeri*. *Aging Cell*. 2009 Apr;8(2):88-99 IF = 7,8 # citations = 125<sup>a</sup>
9. Valenzano, D.R., E. Terzibasi, T. Genade, A. Cattaneo, L. Domenici, and A. Cellerino, Resveratrol prolongs lifespan and retards the onset of age-related markers in a short-lived vertebrate. *Curr Biol*, 2006. 16(3): p. 296-300 Recommended by F1000 Prime, presented in *BBC Radio 4* (The leading edge, 09 Feb 2006) IF = 9,2 # citations = 1000<sup>a</sup>
10. Valdesalici, S. and A. Cellerino, Extremely short lifespan in the annual fish *Nothobranchius furzeri*. *Proc R Soc Lond B Biol Sci*, 2003. 270 Suppl 2: p. S189-91. reviewed in *Science* (Flash in the pond, 301 p.305), *Current Biology* (Life in the fast lane, 13 R584), *The New York Times* (Swim fast die young, 15 Jul 2003) IF = 3,4 # citations = 194<sup>a</sup>

<sup>a</sup> Google Scholar on 24/07/2023

### **Recent preprints**

Elisa Ferrari, Kathrin Reichwald, Philipp Koch, Marco Groth, Mario Baumgart, Alessandro Cellerino, A deep neural network provides an ultraprecise multi-tissue transcriptomic clock for the short-lived fish *Nothobranchius furzeri* and identifies predictive genes translatable to human aging Biorxiv doi: <https://doi.org/10.1101/2022.11.26.517610>

Domenico Di Fraia, Antonio Marino, Jae Ho Lee, Erika Kelmer Sacramento, Mario Baumgart, Sara Bagnoli, Pedro Tomaz da Silva, Amit Kumar Sahu, Giacomo Siano, Max Tiessen, Julien Gagneur, View ORCID Profile Judith Frydman, Alessandro Cellerino, Alessandro Ori A comprehensive atlas of the aging vertebrate brain reveals signatures of progressive proteostasis dysfunction Biorxiv doi: <https://doi.org/10.1101/2023.07.20.549210>

**Bibliometric key indicators**

Database	# citations	h-index
Google Scholar	8765	52
Researchgate	7600	51
Scopus	6210	46
Web of Science	5823	44

**Complete publication list (Pubmed)**

- 1: Chiavacci E, Bagnoli S, Cellerino A, Terzibasi Tozzini E. Distribution of Brain-Derived Neurotrophic Factor in the Brain of the Small-Spotted Catshark *Scyliorhinus canicula* and Evolution of Neurotrophins in Basal Vertebrates. *Int J Mol Sci.* 2023 May 30;24(11):9495. doi: 10.3390/ijms24119495. PMID: 37298444; PMCID: PMC10253963.
  
- 2: Montenegro-Rojas I, Yañez G, Skog E, Guerrero-Calvo O, Andaur-Lobos M, Dolfi L, Cellerino A, Cerda M, Concha ML, Bertocchi C, Rojas NO, Ravasio A, Rudge TJ. A computational framework for testing hypotheses of the minimal mechanical requirements for cell aggregation using early annual killifish embryogenesis as a model. *Front Cell Dev Biol.* 2023 Mar 20;11:959611. doi: 10.3389/fcell.2023.959611. PMID: 37020464; PMCID: PMC10067630.
  
- 3: Bagnoli S, Terzibasi Tozzini E, Cellerino A. Whole-Brain Clearing and Immunofluorescence in *Nothobranchius furzeri*. *Cold Spring Harb Protoc.* 2023 Mar 6. doi: 10.1101/pdb.prot107793. Epub ahead of print. PMID: 36878646.
  
- 4: Bagnoli S, Terzibasi Tozzini E, Cellerino A. Immunofluorescence and Aggresome Staining of *Nothobranchius furzeri* Cryosections. *Cold Spring Harb Protoc.* 2023 Mar 6. doi: 10.1101/pdb.prot107791. Epub ahead of print. PMID: 36878645.
  
- 5: Bagnoli S, Chiavacci E, Cellerino A, Terzibasi Tozzini E. Localization and

Characterization of Major Neurogenic Niches in the Brain of the Lesser-Spotted Dogfish *Scyliorhinus canicula*. *Int J Mol Sci*. 2023 Feb 11;24(4):3650. doi: 10.3390/ijms24043650. PMID: 36835066; PMCID: PMC9967623.

6: Sansevero G, Consorti A, Di Marco I, Terzibasi Tozzini E, Cellerino A, Sale A. Antioxidants Prevent the Effects of Physical Exercise on Visual Cortical Plasticity. *Cells*. 2022 Dec 22;12(1):48. doi: 10.3390/cells12010048. PMID: 36611842; PMCID: PMC9818657.

7: Mazzetto M, Caterino C, Groth M, Ferrari E, Reichard M, Baumgart M, Cellerino A. RNAseq Analysis of Brain Aging in Wild Specimens of Short-Lived Turquoise Killifish: Commonalities and Differences With Aging Under Laboratory Conditions. *Mol Biol Evol*. 2022 Nov 3;39(11):msac219. doi: 10.1093/molbev/msac219. PMID: 36318827; PMCID: PMC9641980.

8: Bagnoli S, Terzibasi Tozzini E, Cellerino A. EdU and Immunofluorescence Staining of *Nothobranchius furzeri* Organotypic Cultures. *Cold Spring Harb Protoc*. 2023 Mar 1;2023(3):107790-pdb.prot. doi: 10.1101/pdb.prot107790. PMID: 36180211.

9: Bagnoli S, Brogi L, Fronte B, Bibbiani C, Terzibasi Tozzini E, Cellerino A. Long-Term Brain Organotypic Cultures of the Turquoise Killifish *Nothobranchius furzeri*. *Cold Spring Harb Protoc*. 2022 Dec 1;2022(12):624-629. doi: 10.1101/pdb.prot107746. Erratum in: *Cold Spring Harb Protoc*. 2023 Jun 30;; PMID: 36167677.

10: Bagnoli S, Fronte B, Bibbiani C, Terzibasi Tozzini E, Cellerino A. Quantification of noradrenergic-, dopaminergic-, and tectal-neurons during aging in the short-lived killifish *Nothobranchius furzeri*. *Aging Cell*. 2022 Sep;21(9):e13689. doi: 10.1111/accel.13689. Epub 2022 Aug 19. PMID: 35986561; PMCID: PMC9470901.

- 11: Reichard M, Blažek R, Žák J, Cellerino A, Polačik M. The sources of sex differences in aging in annual fishes. *J Anim Ecol.* 2022 Mar;91(3):540-550. doi: 10.1111/1365-2656.13656. Epub 2022 Jan 10. PMID: 34954818.
- 12: Louka A, Bagnoli S, Rupert J, Esapa B, Tartaglia GG, Cellerino A, Pastore A, Terzibasi Tozzini E. New lessons on TDP-43 from old *N. furzeri* killifish. *Aging Cell.* 2022 Jan;21(1):e13517. doi: 10.1111/accel.13517. Epub 2021 Dec 23. PMID: 34939315; PMCID: PMC8761016.
- 13: Almada-Pagan PF, Lucas-Sanchez A, Martinez-Nicolas A, Terzibasi E, de Lama MAR, Cellerino A, Mendiola P, de Costa J. Membrane lipids and maximum lifespan in clownfish. *Fish Physiol Biochem.* 2022 Feb;48(1):53-65. doi: 10.1007/s10695-021-01037-1. Epub 2021 Dec 4. PMID: 34862943; PMCID: PMC8844168.
- 14: Holtze S, Gorshkova E, Braude S, Cellerino A, Dammann P, Hildebrandt TB, Hoeflich A, Hoffmann S, Koch P, Terzibasi Tozzini E, Skulachev M, Skulachev VP, Sahm A. Alternative Animal Models of Aging Research. *Front Mol Biosci.* 2021 May 17;8:660959. doi: 10.3389/fmolb.2021.660959. PMID: 34079817; PMCID: PMC8166319.
- 15: Brogi L, Marchese M, Cellerino A, Licitra R, Naef V, Mero S, Bibbiani C, Fronte B.  $\beta$ -Glucans as Dietary Supplement to Improve Locomotion and Mitochondrial Respiration in a Model of Duchenne Muscular Dystrophy. *Nutrients.* 2021 May 12;13(5):1619. doi: 10.3390/nu13051619. PMID: 34065946; PMCID: PMC8151547.
- 16: Terzibasi Tozzini E, Cellerino A. *Nothobranchius* annual killifishes. *Evodevo.* 2020 Dec 15;11(1):25. doi: 10.1186/s13227-020-00170-x. PMID: 33323125; PMCID: PMC7739477.
- 17: Napoli D, Lupori L, Mazziotti R, Sagona G, Bagnoli S, Samad M, Sacramento

EK, Kirkpartick J, Putignano E, Chen S, Terzibasi Tozzini E, Tognini P, Baldi P, Kwok JC, Cellerino A, Pizzorusso T. MiR-29 coordinates age-dependent plasticity brakes in the adult visual cortex. *EMBO Rep.* 2020 Nov 5;21(11):e50431. doi: 10.15252/embr.202050431. Epub 2020 Oct 7. PMID: 33026181; PMCID: PMC7645255.

18: Kelmer Sacramento E, Kirkpatrick JM, Mazzetto M, Baumgart M, Bartolome A, Di Sanzo S, Caterino C, Sanguanini M, Papaevgeniou N, Lefaki M, Childs D, Bagnoli S, Terzibasi Tozzini E, Di Fraia D, Romanov N, Sudmant PH, Huber W, Chondrogianni N, Vendruscolo M, Cellerino A, Ori A. Reduced proteasome activity in the aging brain results in ribosome stoichiometry loss and aggregation. *Mol Syst Biol.* 2020 Jun;16(6):e9596. doi: 10.15252/msb.20209596. PMID: 32558274; PMCID: PMC7301280.

19: Baumgart M, Barth E, Savino A, Groth M, Koch P, Petzold A, Arisi I, Platzer M, Marz M, Cellerino A. Correction to: A miRNA catalogue and ncRNA annotation of the short-living fish *Nothobranchius furzeri*. *BMC Genomics.* 2019 Nov 27;20(1):898. doi: 10.1186/s12864-019-6312-y. Erratum for: *BMC Genomics.* 2017 Sep 5;18(1):693. PMID: 31775605; PMCID: PMC6880417.

20: Dolfi L, Ripa R, Antebi A, Valenzano DR, Cellerino A. Cell cycle dynamics during diapause entry and exit in an annual killifish revealed by FUCCI technology. *Evodevo.* 2019 Nov 8;10:29. doi: 10.1186/s13227-019-0142-5. PMID: 31728179; PMCID: PMC6842169.

21: Cencioni C, Heid J, Krepelova A, Rasa SMM, Kuenne C, Guenther S, Baumgart M, Cellerino A, Neri F, Spallotta F, Gaetano C. Aging Triggers H3K27 Trimethylation Hoarding in the Chromatin of *Nothobranchius furzeri* Skeletal Muscle. *Cells.* 2019 Sep 28;8(10):1169. doi: 10.3390/cells8101169. PMID: 31569376; PMCID: PMC6829443.

22: Irizar PA, Schäuble S, Esser D, Groth M, Frahm C, Priebe S, Baumgart M,

Hartmann N, Marthandan S, Menzel U, Müller J, Schmidt S, Ast V, Caliebe A, König R, Krawczak M, Ristow M, Schuster S, Cellerino A, Diekmann S, Englert C, Hemmerich P, Sühnel J, Guthke R, Witte OW, Platzer M, Ruppin E, Kaleta C. Publisher Correction: Transcriptomic alterations during ageing reflect the shift from cancer to degenerative diseases in the elderly. *Nat Commun.* 2019 May 31;10(1):2459. doi: 10.1038/s41467-019-10559-5. Erratum for: *Nat Commun.* 2018 Jan 30;9(1):327. PMID: 31150008; PMCID: PMC6544640.

23: Leggieri A, Attanasio C, Palladino A, Cellerino A, Lucini C, Paolucci M, Terzibasi Tozzini E, de Girolamo P, D'Angelo L. Identification and Expression of Neurotrophin-6 in the Brain of *Nothobranchius furzeri*: One More Piece in Neurotrophin Research. *J Clin Med.* 2019 Apr 30;8(5):595. doi: 10.3390/jcm8050595. PMID: 31052296; PMCID: PMC6571927.

24: Sahm A, Almáida-Pagán P, Bens M, Mutalipassi M, Lucas-Sánchez A, de Costa Ruiz J, Görlach M, Cellerino A. Analysis of the coding sequences of clownfish reveals molecular convergence in the evolution of lifespan. *BMC Evol Biol.* 2019 Apr 11;19(1):89. doi: 10.1186/s12862-019-1409-0. PMID: 30975078; PMCID: PMC6460853.

25: Montesano A, Baumgart M, Avallone L, Castaldo L, Lucini C, Tozzini ET, Cellerino A, D'Angelo L, de Girolamo P. Age-related central regulation of orexin and NPY in the short-lived African killifish *Nothobranchius furzeri*. *J Comp Neurol.* 2019 May 15;527(9):1508-1526. doi: 10.1002/cne.24638. Epub 2019 Feb 13. PMID: 30666646.

26: Vrtílek M, Žák J, Blažek R, Polačik M, Cellerino A, Reichard M. Limited scope for reproductive senescence in wild populations of a short-lived fish. *Naturwissenschaften.* 2018 Nov 22;105(11-12):68. doi: 10.1007/s00114-018-1594-5. PMID: 30467626.

27: Terrigno M, Bertacchi M, Pandolfini L, Baumgart M, Calvello M, Cellerino A, Studer M, Cremisi F. The microRNA miR-21 Is a Mediator of FGF8 Action on Cortical COUP-TFI Translation. *Stem Cell Reports*. 2018 Sep 11;11(3):756-769. doi: 10.1016/j.stemcr.2018.08.002. Epub 2018 Aug 30. PMID: 30174317; PMCID: PMC6135738.

28: Api M, Notarstefano V, Olivotto I, Cellerino A, Carnevali O. Breeders Age Affects Reproductive Success in *Nothobranchius furzeri*. *Zebrafish*. 2018 Dec;15(6):546-557. doi: 10.1089/zeb.2018.1631. Epub 2018 Aug 28. PMID: 30153095.

29: Terzibasi Tozzini E, Savino A, Ripa R, Battistoni G, Baumgart M, Cellerino A. Corrigendum: Regulation of microRNA expression in the neuronal stem cell niches during aging of the short-lived annual fish *Nothobranchius furzeri*. *Front Cell Neurosci*. 2018 Aug 6;12:227. doi: 10.3389/fncel.2018.00227. Erratum for: *Front Cell Neurosci*. 2014 Feb 21;8:51. PMID: 30116176; PMCID: PMC6090146.

30: Naef V, Monticelli S, Corsinovi D, Mazzetto MT, Cellerino A, Ori M. The age-regulated zinc finger factor ZNF367 is a new modulator of neuroblast proliferation during embryonic neurogenesis. *Sci Rep*. 2018 Aug 7;8(1):11836. doi: 10.1038/s41598-018-30302-2. PMID: 30087422; PMCID: PMC6081467.

31: Sahm A, Bens M, Szafranski K, Holtze S, Groth M, Görlach M, Calkhoven C, Müller C, Schwab M, Kraus J, Kestler HA, Cellerino A, Burda H, Hildebrandt T, Dammann P, Platzer M. Long-lived rodents reveal signatures of positive selection in genes associated with lifespan. *PLoS Genet*. 2018 Mar 23;14(3):e1007272. doi: 10.1371/journal.pgen.1007272. PMID: 29570707; PMCID: PMC5884551.

32: Aramillo Irizar P, Schäuble S, Esser D, Groth M, Frahm C, Priebe S, Baumgart M, Hartmann N, Marthandan S, Menzel U, Müller J, Schmidt S, Ast V, Caliebe A, König R, Krawczak M, Ristow M, Schuster S, Cellerino A, Diekmann S, Englert C,

Hemmerich P, Sühnel J, Guthke R, Witte OW, Platzer M, Ruppin E, Kaleta C.

Transcriptomic alterations during ageing reflect the shift from cancer to degenerative diseases in the elderly. *Nat Commun.* 2018 Jan 30;9(1):327. doi:

10.1038/s41467-017-02395-2. Erratum in: *Nat Commun.* 2019 May 31;10(1):2459.

PMID: 29382830; PMCID: PMC5790807.

33: Api M, Biondi P, Olivotto I, Terzibasi E, Cellerino A, Carnevali O. Effects of Parental Aging During Embryo Development and Adult Life: The Case of *Nothobranchius furzeri*. *Zebrafish.* 2018 Apr;15(2):112-123. doi:

10.1089/zeb.2017.1494. Epub 2018 Jan 5. PMID: 29304310.

34: Heid J, Cencioni C, Ripa R, Baumgart M, Atlante S, Milano G, Scopece A, Kuenne C, Guenther S, Azzimato V, Farsetti A, Rossi G, Braun T, Pompilio G, Martelli F, Zeiher AM, Cellerino A, Gaetano C, Spallotta F. Age-dependent increase of oxidative stress regulates microRNA-29 family preserving cardiac health. *Sci Rep.* 2017 Dec 4;7(1):16839. doi: 10.1038/s41598-017-16829-w. PMID: 29203887; PMCID: PMC5715159.

35: Sahm A, Cellerino A. (Anti-)parallel evolution of lifespan. *Aging (Albany NY).* 2017 Oct 26;9(10):2018-2019. doi: 10.18632/aging.101314. PMID: 29074821; PMCID: PMC5680550.

36: Baumgart M, Barth E, Savino A, Groth M, Koch P, Petzold A, Arisi I, Platzer M, Marz M, Cellerino A. A miRNA catalogue and ncRNA annotation of the short-living fish *Nothobranchius furzeri*. *BMC Genomics.* 2017 Sep 5;18(1):693. doi: 10.1186/s12864-017-3951-8. Erratum in: *BMC Genomics.* 2019 Nov 27;20(1):898. PMID: 28874118; PMCID: PMC5584509.

37: Mazzatenta A, Carluccio A, Robbe D, Giulio CD, Cellerino A. The companion dog as a unique translational model for aging. *Semin Cell Dev Biol.* 2017 Oct;70:141-153. doi: 10.1016/j.semcdb.2017.08.024. Epub 2017 Aug 11. PMID:



28803893.

38: Cellerino A, Terzibasi Tozzini E. Biology of aging: New models, new methods. *Semin Cell Dev Biol.* 2017 Oct;70:98. doi: 10.1016/j.semcdb.2017.07.024. Epub 2017 Jul 19. PMID: 28734772.

39: Cellerino A, Ori A. What have we learned on aging from omics studies? *Semin Cell Dev Biol.* 2017 Oct;70:177-189. doi: 10.1016/j.semcdb.2017.06.012. Epub 2017 Jun 16. PMID: 28630026.

40: Sahm A, Bens M, Platzer M, Cellerino A. Parallel evolution of genes controlling mitonuclear balance in short-lived annual fishes. *Aging Cell.* 2017 Jun;16(3):488-496. doi: 10.1111/accel.12577. Epub 2017 Mar 11. PMID: 28295945; PMCID: PMC5418189.

41: Ripa R, Dolfi L, Terrigno M, Pandolfini L, Savino A, Arcucci V, Groth M, Terzibasi Tozzini E, Baumgart M, Cellerino A. MicroRNA miR-29 controls a compensatory response to limit neuronal iron accumulation during adult life and aging. *BMC Biol.* 2017 Feb 13;15(1):9. doi: 10.1186/s12915-017-0354-x. PMID: 28193224; PMCID: PMC5304403.

42: Blažek R, Poláčik M, Kačer P, Cellerino A, Řežucha R, Methling C, Tomášek O, Syslová K, Terzibasi Tozzini E, Albrecht T, Vrtílek M, Reichard M. Repeated intraspecific divergence in life span and aging of African annual fishes along an aridity gradient. *Evolution.* 2017 Feb;71(2):386-402. doi: 10.1111/evo.13127. Epub 2016 Dec 7. PMID: 27859247.

43: Sahm A, Platzer M, Cellerino A. Outgroups and Positive Selection: The *Nothobranchius furzeri* Case. *Trends Genet.* 2016 Sep;32(9):523-525. doi: 10.1016/j.tig.2016.06.002. Epub 2016 Jul 13. PMID: 27423541.

44: Marthandan S, Baumgart M, Priebe S, Groth M, Schaer J, Kaether C, Guthke R, Cellerino A, Platzer M, Diekmann S, Hemmerich P. Conserved Senescence Associated Genes and Pathways in Primary Human Fibroblasts Detected by RNA-Seq. PLoS One. 2016 May 3;11(5):e0154531. doi: 10.1371/journal.pone.0154531. PMID: 27140416; PMCID: PMC4854426.

45: Baumgart M, Priebe S, Groth M, Hartmann N, Menzel U, Pandolfini L, Koch P, Felder M, Ristow M, Englert C, Guthke R, Platzer M, Cellerino A. Longitudinal RNA-Seq Analysis of Vertebrate Aging Identifies Mitochondrial Complex I as a Small-Molecule-Sensitive Modifier of Lifespan. Cell Syst. 2016 Feb 24;2(2):122-32. doi: 10.1016/j.cels.2016.01.014. Epub 2016 Feb 24. PMID: 27135165.

46: Mazzatenta A, Cellerino A, Origlia N, Barloscio D, Sartucci F, Di Giulio C, Domenici L. Olfactory phenotypic expression unveils human aging. Oncotarget. 2016 Apr 12;7(15):19193-200. doi: 10.18632/oncotarget.8393. PMID: 27027240; PMCID: PMC4991375.

47: D'Angelo L, Avallone L, Cellerino A, de Girolamo P, Paolucci M, Varricchio E, Lucini C. Neurotrophin-4 in the brain of adult *Nothobranchius furzeri*. Ann Anat. 2016 Sep;207:47-54. doi: 10.1016/j.aanat.2016.02.005. Epub 2016 Mar 9. PMID: 26970500.

48: Chiavacci E, D'Aurizio R, Guzzolino E, Russo F, Baumgart M, Groth M, Mariani L, D'Onofrio M, Arisi I, Pellegrini M, Cellerino A, Cremisi F, Pitto L. MicroRNA 19a replacement partially rescues fin and cardiac defects in zebrafish model of Holt Oram syndrome. Sci Rep. 2015 Dec 14;5:18240. doi: 10.1038/srep18240. PMID: 26657204; PMCID: PMC4677400.

49: Reichwald K, Petzold A, Koch P, Downie BR, Hartmann N, Pietsch S, Baumgart M, Chalopin D, Felder M, Bens M, Sahm A, Szafranski K, Taudien S, Groth M, Arisi

I, Weise A, Bhatt SS, Sharma V, Kraus JM, Schmid F, Priebe S, Liehr T, Görlach M, Than ME, Hiller M, Kestler HA, Volff JN, Scharl M, Cellerino A, Englert C, Platzer M. Insights into Sex Chromosome Evolution and Aging from the Genome of a Short-Lived Fish. *Cell*. 2015 Dec 3;163(6):1527-38. doi: 10.1016/j.cell.2015.10.071. PMID: 26638077.

50: Marthandan S, Priebe S, Baumgart M, Groth M, Cellerino A, Guthke R, Hemmerich P, Diekmann S. Similarities in Gene Expression Profiles during In Vitro Aging of Primary Human Embryonic Lung and Foreskin Fibroblasts. *Biomed Res Int*. 2015;2015:731938. doi: 10.1155/2015/731938. Epub 2015 Aug 3. PMID: 26339636; PMCID: PMC4538583.

51: Reichard M, Cellerino A, Valenzano DR. Turquoise killifish. *Curr Biol*. 2015 Aug 31;25(17):R741-2. doi: 10.1016/j.cub.2015.05.009. PMID: 26325129.

52: Cellerino A, Valenzano DR, Reichard M. From the bush to the bench: the annual *Nothobranchius* fishes as a new model system in biology. *Biol Rev Camb Philos Soc*. 2016 May;91(2):511-33. doi: 10.1111/brv.12183. Epub 2015 Apr 28. PMID: 25923786.

53: Priami C, De Michele G, Cotelli F, Cellerino A, Giorgio M, Pelicci PG, Migliaccio E. Modelling the p53/p66Shc Aging Pathway in the Shortest Living Vertebrate *Nothobranchius furzeri*. *Aging Dis*. 2015 Mar 10;6(2):95-108. doi: 10.14336/AD.2014.0228. PMID: 25821638; PMCID: PMC4365960.

54: Limoncin E, Ciocca G, Gravina GL, Carosa E, Mollaioli D, Cellerino A, Mennucci A, Di Sante S, Lenzi A, Jannini EA. Pregnant Women's Preferences for Men's Faces Differ Significantly from Nonpregnant Women. *J Sex Med*. 2015 May;12(5):1142-51. doi: 10.1111/jsm.12849. Epub 2015 Mar 5. PMID: 25754377.

55: Cellerino A, Bally-Cuif L, Pizzorusso T. Editorial for "Regulatory RNAs in

the nervous system". *Front Cell Neurosci.* 2015 Feb 10;9:38. doi:

10.3389/fncel.2015.00038. PMID: 25713514; PMCID: PMC4322715.

56: Baumgart M, Di Cicco E, Rossi G, Cellerino A, Tozzini ET. Comparison of captive lifespan, age-associated liver neoplasias and age-dependent gene expression between two annual fish species: *Nothobranchius furzeri* and

*Nothobranchius korthause*. *Biogerontology.* 2015 Feb;16(1):63-9. doi:

10.1007/s10522-014-9535-y. Epub 2014 Oct 15. PMID: 25315356.

57: Dorn A, Musilová Z, Platzer M, Reichwald K, Cellerino A. The strange case of East African annual fishes: aridification correlates with diversification for a savannah aquatic group? *BMC Evol Biol.* 2014 Oct 14;14:210. doi:

10.1186/s12862-014-0210-3. PMID: 25311226; PMCID: PMC4209228.

58: Dolfi L, Ripa R, Cellerino A. Transition to annual life history coincides with reduction in cell cycle speed during early cleavage in three independent clades of annual killifish. *Evodevo.* 2014 Sep 22;5:32. doi:

10.1186/2041-9139-5-32. PMID: 25276337; PMCID: PMC4177712.

59: Ng'oma E, Groth M, Ripa R, Platzer M, Cellerino A. Transcriptome profiling of natural dichromatism in the annual fishes *Nothobranchius furzeri* and

*Nothobranchius kadleci*. *BMC Genomics.* 2014 Sep 2;15(1):754. doi:

10.1186/1471-2164-15-754. PMID: 25183398; PMCID: PMC4168119.

60: Ng'oma E, Reichwald K, Dorn A, Wittig M, Balschun T, Franke A, Platzer M, Cellerino A. The age related markers lipofuscin and apoptosis show different

genetic architecture by QTL mapping in short-lived *Nothobranchius* fish. *Aging (Albany NY).* 2014 Jun;6(6):468-80. doi: 10.18632/aging.100660. PMID: 25093339;

PMCID: PMC4100809.

61: Ciocca G, Limoncin E, Cellerino A, Fisher AD, Gravina GL, Carosa E,

Mollaioli D, Valenzano DR, Mennucci A, Bandini E, Di Stasi SM, Maggi M, Lenzi A, Jannini EA. Gender identity rather than sexual orientation impacts on facial preferences. *J Sex Med.* 2014 Oct;11(10):2500-7. doi: 10.1111/jsm.12633. Epub 2014 Jul 27. PMID: 25066178.

62: Baumgart M, Groth M, Priebe S, Savino A, Testa G, Dix A, Ripa R, Spallotta F, Gaetano C, Ori M, Terzibasi Tozzini E, Guthke R, Platzer M, Cellerino A. RNA-seq of the aging brain in the short-lived fish *N. furzeri* - conserved pathways and novel genes associated with neurogenesis. *Aging Cell.* 2014 Dec;13(6):965-74. doi: 10.1111/accel.12257. Epub 2014 Jul 25. PMID: 25059688; PMCID: PMC4326923.

63: D'Angelo L, Castaldo L, Cellerino A, de Girolamo P, Lucini C. Nerve growth factor in the adult brain of a teleostean model for aging research: *Nothobranchius furzeri*. *Ann Anat.* 2014 Jul;196(4):183-91. doi: 10.1016/j.aanat.2014.02.004. Epub 2014 Mar 10. PMID: 24731749.

64: Gatta C, Castaldo L, Cellerino A, de Girolamo P, Lucini C, D'Angelo L. Brain derived neurotrophic factor in the retina of the teleost *N. furzeri*. *Ann Anat.* 2014 Jul;196(4):192-6. doi: 10.1016/j.aanat.2014.01.002. Epub 2014 Feb 6. PMID: 24629406.

65: Terzibasi Tozzini E, Savino A, Ripa R, Battistoni G, Baumgart M, Cellerino A. Regulation of microRNA expression in the neuronal stem cell niches during aging of the short-lived annual fish *Nothobranchius furzeri*. *Front Cell Neurosci.* 2014 Feb 21;8:51. doi: 10.3389/fncel.2014.00051. Erratum in: *Front Cell Neurosci.* 2018 Aug 06;12:227. PMID: 24600353; PMCID: PMC3930850.

66: Bartáková V, Reichard M, Janko K, Polačik M, Blažek R, Reichwald K, Cellerino A, Bryja J. Strong population genetic structuring in an annual fish, *Nothobranchius furzeri*, suggests multiple savannah refugia in southern Mozambique. *BMC Evol Biol.* 2013 Sep 12;13:196. doi: 10.1186/1471-2148-13-196.

PMID: 24028633; PMCID: PMC4231482.

67: D'Angelo L, De Girolamo P, Lucini C, Terzibasi ET, Baumgart M, Castaldo L, Cellerino A. Brain-derived neurotrophic factor: mRNA expression and protein distribution in the brain of the teleost *Nothobranchius furzeri*. J Comp Neurol. 2014 Apr 1;522(5):1004-30. doi: 10.1002/cne.23457. PMID: 23983038.

68: Tozzini ET, Dorn A, Ng'oma E, Polačik M, Blažek R, Reichwald K, Petzold A, Watters B, Reichard M, Cellerino A. Parallel evolution of senescence in annual fishes in response to extrinsic mortality. BMC Evol Biol. 2013 Apr 3;13:77. doi: 10.1186/1471-2148-13-77. PMID: 23551990; PMCID: PMC3623659.

69: Ng'oma E, Valdesalici S, Reichwald K, Cellerino A. Genetic and morphological studies of *Nothobranchius* (Cyprinodontiformes) from Malawi with description of *Nothobranchius wattersi* sp. nov. J Fish Biol. 2013 Jan;82(1):165-88. doi: 10.1111/jfb.12001. Epub 2012 Dec 17. PMID: 23331144.

70: Bertacchi M, Pandolfini L, Murenu E, Viegi A, Capsoni S, Cellerino A, Messina A, Casarosa S, Cremisi F. The positional identity of mouse ES cell-generated neurons is affected by BMP signaling. Cell Mol Life Sci. 2013 Mar;70(6):1095-111. doi: 10.1007/s00018-012-1182-3. Epub 2012 Oct 16. PMID: 23069989; PMCID: PMC3578729.

71: Baumgart M, Groth M, Priebe S, Appelt J, Guthke R, Platzer M, Cellerino A. Age-dependent regulation of tumor-related microRNAs in the brain of the annual fish *Nothobranchius furzeri*. Mech Ageing Dev. 2012 May;133(5):226-33. doi: 10.1016/j.mad.2012.03.015. Epub 2012 Apr 6. PMID: 22487494.

72: Kirschner J, Weber D, Neuschl C, Franke A, Böttger M, Zielke L, Powalsky E, Groth M, Shagin D, Petzold A, Hartmann N, Englert C, Brockmann GA, Platzer M, Cellerino A, Reichwald K. Mapping of quantitative trait loci controlling

lifespan in the short-lived fish *Nothobranchius furzeri*--a new vertebrate model for age research. *Aging Cell*. 2012 Apr;11(2):252-61. doi: 10.1111/j.1474-9726.2011.00780.x. Epub 2012 Jan 13. PMID: 22221414; PMCID: PMC3437503.

73: Tozzini ET, Baumgart M, Battistoni G, Cellerino A. Adult neurogenesis in the short-lived teleost *Nothobranchius furzeri*: localization of neurogenic niches, molecular characterization and effects of aging. *Aging Cell*. 2012 Apr;11(2):241-51. doi: 10.1111/j.1474-9726.2011.00781.x. Epub 2012 Jan 13. PMID: 22171971; PMCID: PMC3437507.

74: D'Angelo L, De Girolamo P, Cellerino A, Tozzini ET, Varricchio E, Castaldo L, Lucini C. Immunolocalization of S100-like protein in the brain of an emerging model organism: *Nothobranchius furzeri*. *Microsc Res Tech*. 2012 Apr;75(4):441-7. doi: 10.1002/jemt.21075. Epub 2011 Oct 22. PMID: 22021149.

75: Dorn A, Ng'oma E, Janko K, Reichwald K, Polačik M, Platzer M, Cellerino A, Reichard M. Phylogeny, genetic variability and colour polymorphism of an emerging animal model: the short-lived annual *Nothobranchius* fishes from southern Mozambique. *Mol Phylogenet Evol*. 2011 Dec;61(3):739-49. doi: 10.1016/j.ympev.2011.06.010. Epub 2011 Jun 25. PMID: 21708276.

76: D'Angelo L, de Girolamo P, Cellerino A, Tozzini ET, Castaldo L, Lucini C. Neurotrophin Trk receptors in the brain of a teleost fish, *Nothobranchius furzeri*. *Microsc Res Tech*. 2012 Jan;75(1):81-8. doi: 10.1002/jemt.21028. Epub 2011 Jun 15. PMID: 21678525.

77: Hartmann N, Reichwald K, Wittig I, Dröse S, Schmeisser S, Lück C, Hahn C, Graf M, Gausmann U, Terzibasi E, Cellerino A, Ristow M, Brandt U, Platzer M, Englert C. Mitochondrial DNA copy number and function decrease with age in the short-lived fish *Nothobranchius furzeri*. *Aging Cell*. 2011 Oct;10(5):824-31. doi:

10.1111/j.1474-9726.2011.00723.x. Epub 2011 Jun 27. PMID: 21624037.

78: Di Cicco E, Tozzini ET, Rossi G, Cellerino A. The short-lived annual fish *Nothobranchius furzeri* shows a typical teleost aging process reinforced by high incidence of age-dependent neoplasias. *Exp Gerontol.* 2011 Apr;46(4):249-56. doi: 10.1016/j.exger.2010.10.011. Epub 2010 Nov 3. PMID: 21056099.

79: Reichard M, Watters BR, Wildekamp RH, Sonnenberg R, Nagy B, Polacik M, Valdesalici S, Cellerino A, Cooper BJ, Hengstler H, Rosenstock J, Sainthouse I. Potential negative impacts and low effectiveness in the use of African annual killifish in the biocontrol of aquatic mosquito larvae in temporary water bodies. *Parasit Vectors.* 2010 Sep 16;3:89. doi: 10.1186/1756-3305-3-89. PMID: 20846414; PMCID: PMC2945331.

80: Graf M, Cellerino A, Englert C. Gender separation increases somatic growth in females but does not affect lifespan in *Nothobranchius furzeri*. *PLoS One.* 2010 Aug 3;5(8):e11958. doi: 10.1371/journal.pone.0011958. PMID: 20689818; PMCID: PMC2914755.

81: Valenzano DR, Kirschner J, Kamber RA, Zhang E, Weber D, Cellerino A, Englert C, Platzer M, Reichwald K, Brunet A. Mapping loci associated with tail color and sex determination in the short-lived fish *Nothobranchius furzeri*. *Genetics.* 2009 Dec;183(4):1385-95. doi: 10.1534/genetics.109.108670. Epub 2009 Sep 28. PMID: 19786620; PMCID: PMC2787427.

82: Hartmann N, Reichwald K, Lechel A, Graf M, Kirschner J, Dorn A, Terzibasi E, Wellner J, Platzer M, Rudolph KL, Cellerino A, Englert C. Telomeres shorten while Tert expression increases during ageing of the short-lived fish *Nothobranchius furzeri*. *Mech Ageing Dev.* 2009 May;130(5):290-6. doi: 10.1016/j.mad.2009.01.003. Epub 2009 Jan 22. PMID: 19428446.



- 83: Terzibasi E, Lefrançois C, Domenici P, Hartmann N, Graf M, Cellerino A. Effects of dietary restriction on mortality and age-related phenotypes in the short-lived fish *Nothobranchius furzeri*. *Aging Cell*. 2009 Apr;8(2):88-99. doi: 10.1111/j.1474-9726.2009.00455.x. PMID: 19302373.
- 84: Reichwald K, Lauber C, Nanda I, Kirschner J, Hartmann N, Schories S, Gausmann U, Taudien S, Schilhabel MB, Szafranski K, Glöckner G, Schmid M, Cellerino A, Scharl M, Englert C, Platzer M. High tandem repeat content in the genome of the short-lived annual fish *Nothobranchius furzeri*: a new vertebrate model for aging research. *Genome Biol*. 2009 Feb 11;10(2):R16. doi: 10.1186/gb-2009-10-2-r16. PMID: 19210790; PMCID: PMC2688266.
- 85: Terzibasi E, Valenzano DR, Benedetti M, Roncaglia P, Cattaneo A, Domenici L, Cellerino A. Large differences in aging phenotype between strains of the short-lived annual fish *Nothobranchius furzeri*. *PLoS One*. 2008;3(12):e3866. doi: 10.1371/journal.pone.0003866. Epub 2008 Dec 4. PMID: 19052641; PMCID: PMC2585814.
- 86: Arango-González B, Cellerino A, Kohler K. Exogenous brain-derived neurotrophic factor (BDNF) reverts phenotypic changes in the retinas of transgenic mice lacking the BDNF gene. *Invest Ophthalmol Vis Sci*. 2009 Mar;50(3):1416-22. doi: 10.1167/iovs.08-2244. Epub 2008 Nov 7. PMID: 18997090.
- 87: Terzibasi E, Calamusa M, Novelli E, Domenici L, Strettoi E, Cellerino A. Age-dependent remodelling of retinal circuitry. *Neurobiol Aging*. 2009 May;30(5):819-28. doi: 10.1016/j.neurobiolaging.2007.08.017. Epub 2007 Oct 24. PMID: 17920161.
- 88: Calamusa M, Pattabiraman PP, Pozdeyev N, Iuvone PM, Cellerino A, Domenici L. Specific alterations of tyrosine hydroxylase immunopositive cells in the retina of NT-4 knock out mice. *Vision Res*. 2007 May;47(11):1523-36. doi:

10.1016/j.visres.2007.01.017. Epub 2007 Mar 9. PMID: 17350071.

89: Cellerino A, Borghetti D, Valenzano DR, Tartarelli G, Mennucci A, Murri L, Sartucci F. Neurophysiological correlates for the perception of facial sexual dimorphism. *Brain Res Bull.* 2007 Mar 15;71(5):515-22. doi:

10.1016/j.brainresbull.2006.11.007. Epub 2006 Dec 11. PMID: 17259021.

90: Terzibasi E, Valenzano DR, Cellerino A. The short-lived fish *Nothobranchius furzeri* as a new model system for aging studies. *Exp Gerontol.* 2007 Jan-Feb;42(1-2):81-9. doi: 10.1016/j.exger.2006.06.039. Epub 2006 Oct 17. PMID: 17049789.

91: Valenzano DR, Terzibasi E, Cattaneo A, Domenici L, Cellerino A. Temperature affects longevity and age-related locomotor and cognitive decay in the short-lived fish *Nothobranchius furzeri*. *Aging Cell.* 2006 Jun;5(3):275-8. doi: 10.1111/j.1474-9726.2006.00212.x. PMID: 16842500.

92: Valenzano DR, Cellerino A. Resveratrol and the pharmacology of aging: a new vertebrate model to validate an old molecule. *Cell Cycle.* 2006 May;5(10):1027-32. doi: 10.4161/cc.5.10.2739. Epub 2006 May 15. PMID: 16687936.

93: Valenzano DR, Terzibasi E, Genade T, Cattaneo A, Domenici L, Cellerino A. Resveratrol prolongs lifespan and retards the onset of age-related markers in a short-lived vertebrate. *Curr Biol.* 2006 Feb 7;16(3):296-300. doi: 10.1016/j.cub.2005.12.038. PMID: 16461283.

94: Valenzano DR, Mennucci A, Tartarelli G, Cellerino A. Shape analysis of female facial attractiveness. *Vision Res.* 2006 Apr;46(8-9):1282-91. doi: 10.1016/j.visres.2005.10.024. Epub 2005 Dec 13. PMID: 16356527.

95: Cellerino A, Jannini EA. Why humans need type 5 phosphodiesterase

inhibitors. *Int J Androl*. 2005 Dec;28 Suppl 2:14-7. doi: 10.1111/j.1365-2605.2005.00582.x. PMID: 16236058.

96: Genade T, Benedetti M, Terzibasi E, Roncaglia P, Valenzano DR, Cattaneo A, Cellerino A. Annual fishes of the genus *Nothobranchius* as a model system for aging research. *Aging Cell*. 2005 Oct;4(5):223-33. doi: 10.1111/j.1474-9726.2005.00165.x. PMID: 16164422.

97: Surace EM, Domenici L, Cortese K, Cotugno G, Di Vicino U, Venturi C, Cellerino A, Marigo V, Tacchetti C, Ballabio A, Auricchio A. Amelioration of both functional and morphological abnormalities in the retina of a mouse model of ocular albinism following AAV-mediated gene transfer. *Mol Ther*. 2005 Oct;12(4):652-8. doi: 10.1016/j.ymthe.2005.06.001. PMID: 16023414.

98: Cellerino A. On the possible use of annual killifishes as models for aging research: a comment on Herrera and Jagadeeswaran. *J Gerontol A Biol Sci Med Sci*. 2005 Jun;60(6):679. doi: 10.1093/gerona/60.6.679. PMID: 15983167.

99: Cellerino A, Jannini EA. Male reproductive physiology as a sexually selected handicap? Erectile dysfunction is correlated with general health and health prognosis and may have evolved as a marker of poor phenotypic quality. *Med Hypotheses*. 2005;65(1):179-84. doi: 10.1016/j.mehy.2004.10.020. PMID: 15893137.

100: Rex TS, Allocca M, Domenici L, Surace EM, Maguire AM, Lyubarsky A, Cellerino A, Bennett J, Auricchio A. Systemic but not intraocular Epo gene transfer protects the retina from light-and genetic-induced degeneration. *Mol Ther*. 2004 Nov;10(5):855-61. doi: 10.1016/j.ymthe.2004.07.027. PMID: 15509503.

101: Cellerino A, Borghetti D, Sartucci F. Sex differences in face gender recognition in humans. *Brain Res Bull*. 2004 Jul 15;63(6):443-9. doi: 10.1016/j.brainresbull.2004.03.010. PMID: 15249109.

- 102: Mazzatenta A, Pelosi P, Cellerino A. Cloning of an olfactory sensory neuron-specific protein in the land snail (*Eobania vermiculata*). Proc Biol Sci. 2004 Feb 7;271 Suppl 3(Suppl 3):S46-9. doi: 10.1098/rsbl.2003.0093. PMID: 15101416; PMCID: PMC1809978.
- 103: Valdesalici S, Cellerino A. Extremely short lifespan in the annual fish *Nothobranchius furzeri*. Proc Biol Sci. 2003 Nov 7;270 Suppl 2(Suppl 2):S189-91. doi: 10.1098/rsbl.2003.0048. PMID: 14667379; PMCID: PMC1809958.
- 104: Cellerino A, Arango-González B, Pinzón-Duarte G, Kohler K. Brain-derived neurotrophic factor regulates expression of vasoactive intestinal polypeptide in retinal amacrine cells. J Comp Neurol. 2003 Dec 1;467(1):97-104. doi: 10.1002/cne.10908. PMID: 14574682.
- 105: Cellerino A. Psychobiology of facial attractiveness. J Endocrinol Invest. 2003;26(3 Suppl):45-8. PMID: 12834020.
- 106: Isenmann S, Kretz A, Cellerino A. Molecular determinants of retinal ganglion cell development, survival, and regeneration. Prog Retin Eye Res. 2003 Jul;22(4):483-543. doi: 10.1016/s1350-9462(03)00027-2. PMID: 12742393.
- 107: Cellerino A, Bähr M, Isenmann S. Apoptosis in the developing visual system. Cell Tissue Res. 2000 Jul;301(1):53-69. doi: 10.1007/s004410000178. PMID: 10928281.
- 108: Cellerino A, Galli-Resta L, Colombaioni L. The dynamics of neuronal death: a time-lapse study in the retina. J Neurosci. 2000 Aug 15;20(16):RC92. doi: 10.1523/JNEUROSCI.20-16-j0002.2000. PMID: 10924529; PMCID: PMC6772594.
- 109: Cellerino A, Novelli E, Galli-Resta L. Retinal ganglion cells with NADPH-

diaphorase activity in the chick form a regular mosaic with a strong dorsoventral asymmetry that can be modelled by a minimal spacing rule. *Eur J Neurosci*. 2000 Feb;12(2):613-20. doi: 10.1046/j.1460-9568.2000.00944.x. PMID: 10712641.

110: Cellerino A, Arango-González BA, Kohler K. Effects of brain-derived neurotrophic factor on the development of NADPH-diaphorase/nitric oxide synthase-positive amacrine cells in the rodent retina. *Eur J Neurosci*. 1999 Aug;11(8):2824-34. doi: 10.1046/j.1460-9568.1999.00690.x. PMID: 10457179.

111: Isenmann S, Cellerino A, Gravel C, Bähr M. Excess target-derived brain-derived neurotrophic factor preserves the transient uncrossed retinal projection to the superior colliculus. *Mol Cell Neurosci*. 1999 Jul;14(1):52-65. doi: 10.1006/mcne.1999.0763. PMID: 10433817.

112: Cellerino A, Michaelidis T, Barski JJ, Bähr M, Thoenen H, Meyer M. Retinal ganglion cell loss after the period of naturally occurring cell death in *bcl-2*<sup>-/-</sup> mice. *Neuroreport*. 1999 Apr 6;10(5):1091-5. doi: 10.1097/00001756-199904060-00034. PMID: 10321489.

113: Cellerino A, Pinzón-Duarte G, Carroll P, Kohler K. Brain-derived neurotrophic factor modulates the development of the dopaminergic network in the rodent retina. *J Neurosci*. 1998 May 1;18(9):3351-62. doi: 10.1523/JNEUROSCI.18-09-03351.1998. PMID: 9547243; PMCID: PMC6792644.

114: Klöcker N, Cellerino A, Bähr M. Free radical scavenging and inhibition of nitric oxide synthase potentiates the neurotrophic effects of brain-derived neurotrophic factor on axotomized retinal ganglion cells *In vivo*. *J Neurosci*. 1998 Feb 1;18(3):1038-46. doi: 10.1523/JNEUROSCI.18-03-01038.1998. PMID: 9437024; PMCID: PMC6792783.

115: Cellerino A, Kohler K. Brain-derived neurotrophic factor/neurotrophin-4 receptor TrkB is localized on ganglion cells and dopaminergic amacrine cells in the vertebrate retina. *J Comp Neurol*. 1997 Sep 15;386(1):149-60. PMID: 9303531.

116: Cellerino A, Carroll P, Thoenen H, Barde YA. Reduced size of retinal ganglion cell axons and hypomyelination in mice lacking brain-derived neurotrophic factor. *Mol Cell Neurosci*. 1997;9(5-6):397-408. doi: 10.1006/mcne.1997.0641. PMID: 9361277.

117: Cellerino A, Maffei L, Domenici L. The distribution of brain-derived neurotrophic factor and its receptor trkB in parvalbumin-containing neurons of the rat visual cortex. *Eur J Neurosci*. 1996 Jun;8(6):1190-7. doi: 10.1111/j.1460-9568.1996.tb01287.x. PMID: 8752589.

118: Cellerino A, Maffei L. The action of neurotrophins in the development and plasticity of the visual cortex. *Prog Neurobiol*. 1996 May;49(1):53-71. doi: 10.1016/0301-0082(96)00008-1. Erratum in: *Prog Neurobiol* 1996 Oct;50(2-3):333. PMID: 8817698.

119: Cellerino A. Expression of messenger RNA coding for the nerve growth factor receptor trkA in the hippocampus of the adult rat. *Neuroscience*. 1996 Feb;70(3):613-16. doi: 10.1016/s0306-4522(96)83001-6. PMID: 9045075.

120: Marty S, Carroll P, Cellerino A, Castrén E, Staiger V, Thoenen H, Lindholm D. Brain-derived neurotrophic factor promotes the differentiation of various hippocampal nonpyramidal neurons, including Cajal-Retzius cells, in organotypic slice cultures. *J Neurosci*. 1996 Jan 15;16(2):675-87. doi: 10.1523/JNEUROSCI.16-02-00675.1996. PMID: 8551351; PMCID: PMC6578634.

121: Domenici L, Cellerino A, Berardi N, Cattaneo A, Maffei L. Antibodies to nerve growth factor (NGF) prolong the sensitive period for monocular deprivation

in the rat. *Neuroreport*. 1994 Oct 27;5(16):2041-4. doi: 10.1097/00001756-199410270-00013. PMID: 7865740.

122: Berardi N, Cellerino A, Domenici L, Fagiolini M, Pizzorusso T, Cattaneo A, Maffei L. Monoclonal antibodies to nerve growth factor affect the postnatal development of the visual system. *Proc Natl Acad Sci U S A*. 1994 Jan 18;91(2):684-8. doi: 10.1073/pnas.91.2.684. PMID: 8290581; PMCID: PMC43013.

123: Domenici L, Cellerino A, Maffei L. Monocular deprivation effects in the rat visual cortex and lateral geniculate nucleus are prevented by nerve growth factor (NGF). II. Lateral geniculate nucleus. *Proc Biol Sci*. 1993 Jan 22;251(1330):25-31. doi: 10.1098/rspb.1993.0004. PMID: 8094562.

124: Berardi N, Domenici L, Parisi V, Pizzorusso T, Cellerino A, Maffei L. Monocular deprivation effects in the rat visual cortex and lateral geniculate nucleus are prevented by nerve growth factor (NGF). I. Visual cortex. *Proc Biol Sci*. 1993 Jan 22;251(1330):17-23. doi: 10.1098/rspb.1993.0003. PMID: 8094561.

125: Cellerino A, Siciliano R, Domenici L, Maffei L. Parvalbumin immunoreactivity: a reliable marker for the effects of monocular deprivation in the rat visual cortex. *Neuroscience*. 1992 Dec;51(4):749-53. doi: 10.1016/0306-4522(92)90514-3. PMID: 1488119.