

BIOGRAPHICAL SKETCH
ENRICA STRETTOI, CNR NEUROSCIENCE INSTITUTE, PISA

| NAME Enrica Stretto | | POSITION TITLE Director of Research, CNR Neuroscience Institute, Pisa, Italy | |
|--|----------------------------------|--|----------------------------|
| EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i> | | | |
| INSTITUTION AND LOCATION | DEGREE <i>(if applicable)</i> | MM/YY | FIELD OF STUDY |
| University of Pisa | Laurea | 11/1983 | Biological Sciences |
| University of Pisa | PhD | 1989 | Neuroscience |

A. Personal Statement

I am a Director of Research at the Institute of Neuroscience of the National Research Council of Italy (IN-CNR), in Pisa, where I have been active for over 30 years in the field of retinal neurobiology, contributing to now classical studies of correlations of structure and function in the retina. My scientific approach consists in combining quantitative microscopy with neurobiology, behavioral and molecular techniques to understand the functional role of retinal neurons and their alterations in genetic diseases of the eye.

In the last 20 years, I have dedicated most of my research activity to understand the pathophysiology of inherited photoreceptor degenerations causing genetic disorders leading to blindness. I have revealed fundamental aspects of retinal network remodeling following photoreceptor loss; I have also implemented experimental strategies of photoreceptor rescue based on pharmacological approaches as well as onto manipulation of the environment, with the final goal of developing treatments to delay human retinal diseases. I have collaborations with scientists located in Italy, Europe, the USA and Australia for projects of retinal patho-physiology, biochemistry and study of neuronal circuitry.

I participate to the activities of the University of Pisa where I have been for many years an adjunct Professor of Neurobiology, teaching to Biology and to Neuroscience students. I am a member of the Regional Doctorate School in Neuroscience and I have mentored over 20 graduate students (Italians and international) in my laboratory. I enjoy the part of my research involving training and motivation of future investigators, showing them the various and fascinating aspects of retinal research and of Neuroscience in general. I have a long-term collaboration with Prof. Claudia Gargini, from the Department of Pharmacy of the University of Pisa, with whom I share a strong interest in retinal research. I also interact proficiently with scientists of my Institute and open to collaborations worldwide.

I have authored over 60 articles and contributed to textbooks and encyclopedias. I have been recipient of numerous international grants, including two research projects funded for 10 years by the National Institute of Health, USA. I am presently funded by the EU and by national and international foundations.

For many years, I have been the Director Delegate (RUOS) of the Pisa site of my Institute and I continue to participate to many CNR initiatives at local and national level. I am also involved in international organisms as a member of ARVO (a worldwide Association for Research in Vision and Ophthalmology) where I have been part of the Annual Meeting Program Committee and I am now a component of the Awards Committee.

B. Positions and Honors

Positions and Employment

1988 – 2001: Tenured Researcher, CNR Institute of Neurophysiology, Pisa

2001- 2018: Senior Investigator, CNR Institute of Neuroscience, Pisa

2018 –: Director of Research, CNR Neuroscience Institute, Pisa, Italy

Other Experience and Professional Memberships

2018- present: Adjunct Professor of Physiological Genomics, Neuroscience Degree, Department of Biology, University of Pisa, Italy

2014-2018: Adjunct Professor of Comparative Neurobiology, Neuroscience Degree, Department of Biology, University of Pisa, Italy

2014: National habilitations for the role of Full Professor of Physiology (05-D1) and of Human Anatomy (05-H1)

2013 – present: Faculty Member of the Regional Doctoral School in Neuroscience, Universities of Florence, Pisa and Siena

2001- 2013: Faculty Member of the Doctoral course in Neuroscience, University of Pisa

2004-2010: Faculty Member of the international summer course “Fundamental issues in vision research”, Marine Biological Laboratories, Woods Hole, USA

2004 – 2005: Adjunct Professor of Neurobiology, Faculty of Science, Biology and Biotechnology degrees, University of Pisa

1999- 2001: Adjunct Professor of Physiology, Faculty of Pharmacy, University of Pisa

Institutional (CNR) responsibilities

2005-2015: Director Delegate (RUOS), Head of the Pisa site of the Institute of Neuroscience, Italian National Research Council (CNR), Pisa and of the Florence site of IN-CNR.

2011-2015: Head of the national project “Neuroscience: Molecular bases and clinical applications” of the CNR, Department of Biomedical Sciences

1998-2005: Responsible for animal experimentation, Institute of Neurophysiology (later, Institute of Neuroscience), Italian National Research Council (CNR), Pisa

Honours

2016: International Research Collaborative Award IRCA), University of Sydney, Australia. Award to support a period of research in the laboratories of the Save Sight Institute (Sydney) for studies on the primate retina (July-September 2016).

2011: Mention of the Emory University Eye Center, Atlanta, USA, for “outstanding contributions to the field of Eye Research”.

2010: Mention for outstanding scientific results in the "Highlights 2009/2010" of the CNR.

2009: Award of the “Associazione Toscana Retinopatici ed Ipovedenti onlus”, ATRI, for scientific activities and personal dedication to the cure of retinal diseases.

2004: Mention of the President of the Italian CNR for the publication of a study recognised as excellent contribution to the mission of the CNR.

Commissions of trust (selection)

2018: Ad hoc member, evaluating Committee, NIH Board of Scientific Councilors, Bethesda, USA

2018-: Member of the Short Term Mobility evaluation committee, CNR

2018-2021: Member, International Awards Committee, ARVO (Association for Research in Vision and Ophthalmology), USA

2015-2018: Member, Annual Meeting Program Committee of ARVO (Association for Research in Vision and Ophthalmology), USA

2013: Member, International search committee for the European Research Award recipient

2010: Scientific evaluator, advanced ERC research award, EU

Editorial Boards

2018-present: Editorial board member, Scientific Reports

2014-present: Editorial board member, Frontiers in Neuroanatomy

2014–present: Editorial board member, The Journal of Comparative Neurology, Wiley-LISS, USA

2011–present: Editorial board member, Molecular Vision, USA
2002-2006: Editorial board member, Archives Italiennes de Biologie

I often act as “ad hoc” referee for the European Research Council, the Italian Ministry of Education, the National French Research Agency and various international organisms and non-profit organizations (i.e. Retinitis Pigmentosa Society of UK Countries etc.). She also acts as a referee for numerous scientific journals in the field of vision research, ophthalmology and Neuroscience, including the Journal of Neuroscience, Nature, PNAS, Plos Biology. She has been appointed as a member of committees for the PhD defense of international PhD students and for the evaluation of candidates for international academic positions.

Membership of scientific societies

Member of the Association of Research for Vision and Ophthalmology (ARVO)
Member of the Società Italiana di Neuroscienze (SINS)
Past member of the Society For Neuroscience

Organization of international conferences (selection)

2015-2018: As a member of the Annual Meeting Program Committee of ARVO (Association for Research in Vision and Ophthalmology), I contributed to the scientific organization of 3 annual meetings (12,000 participants) and organized two minisymposia in 2017 (Baltimore) and one plenary symposium in 2018 (Honolulu).

Recent invited oral presentations (selection)

- 2019.** Brain Mind Institute, Lausanne, Switzerland.
- 2019.** Ryan Initiative on Macular Research, RIMR Conference. Irvine, USA.
- 2019.** ARVO-IT Chapter. Catania, Italy.
- 2018.** Monaciano International Symposium on Retinal Degeneration. II. Kellogg Eye Center, University of Michigan. Monaciano (Siena), Italy.
- 2018.** New Horizons in Vision and Hearing Research, University of Tübingen, Germany. International symposium.
- 2018.** Sensory systems in health and disease, University of Oldenburg School. Verona, Italy. 2017. Town University, New York City, NY, USA.
- 2016.** University of Melbourne. Department of Anatomy and Neuroscience.
- 2016.** University of Sydney. Save Sight Institute, Sydney Eye Hospital.
- 2015.** University of Washington, Department of Biological Structure, Seattle.
- 2014.** University of Catania, Italy. Opening lecture. “European Frontiers in Ocular Pharmacology series”,
- 2014.** CNR Institute of Neurobiology, Rome. Director seminar series.
- 2013.** Monaciano International Symposium on Retinal Degeneration. Kellogg Eye Center, University of Michigan. Monaciano (Siena), Italy. Invited participant.
- 2012.** Optogenetics Symposium. Foundation Fighting Blindness and Harvard Medical School, Boston, USA.

C. Selected Peer-reviewed Publications (20 most significant peer-reviewed publications)- from the entire scientific production

Publication highlights : H-index: 34 (Scholar)

Author of 63 peer-reviewed articles, 2 encyclopedia chapters and 6 book chapters, with 6,500 citations total

1. Falasconi A, Biagioni M, Novelli E, Piano I, Gargini C, Strettoi E. Retinal Phenotype in the rd9 Mutant Mouse, a Model of X-Linked RP. *Front Neurosci.* 2019 Sep 19;13:991. eCollection 2019.
2. Guadagni V, Biagioni M, Novelli E, Aretini P, Mazzanti CM, Strettoi E. Rescuing cones and daylight vision in retinitis pigmentosa mice. *FASEB J.* 2019 Sep;33(9):10177-10192. doi: 10.1096/fj.201900414R.
3. Strettoi E, Masri RA, Grünert U. All amacrine cells in the primate fovea contribute to photopic vision. *Sci Rep.* 2018 Nov 6;8(1):16429. doi: 10.1038/s41598-018-34621-2.
4. Ghinia MG, Novelli E, Sajgo S, Badea TC, Strettoi E. Brn3a and Brn3b knockout mice display unvaried retinal fine structure despite major morphological and

- numerical alterations of ganglion cells. *J Comp Neurol.* 2019 Jan 1;527(1):187-211. doi: 10.1002/cne.24072. Epub 2016 Jul 29.
5. Guadagni V, Novelli E, Piano I, Gargini C, Strettoi E. Pharmacological approaches to retinitis pigmentosa: A laboratory perspective. *Prog Retin Eye Res.* 2015 Sep;48:62-81.
 6. Strettoi E. A Survey of Retinal Remodeling. *Front Cell Neurosci.* 2015 Dec 23;9:494. doi: 10.3389/fncel.2015.00494. eCollection 2015. Review.
 7. Damiani D, Novelli E, Mazzoni F, Strettoi E. Undersized dendritic arborizations in retinal ganglion cells of the rd1 mutant mouse: a paradigm of early onset photoreceptor degeneration. *J Comp Neurol.* 2012 May 1;520(7):1406-23.
 8. Barone I, Novelli E, Piano I, Gargini C, Strettoi E. Environmental enrichment extends photoreceptor survival and visual function in a mouse model of retinitis pigmentosa. *PLoS One.* 2012;7(11):e50726.
 9. Strettoi E, Gargini C, Novelli E, Sala G, Piano I, Gasco P, Ghidoni R. Inhibition of ceramide biosynthesis preserves photoreceptor structure and function in a mouse model of retinitis pigmentosa. *Proc Natl Acad Sci U S A.* 2010 Oct 26;107(43):18706-11.
 10. Mazzoni F, Novelli E, Strettoi E. Retinal ganglion cells survive and maintain normal dendritic morphology in a mouse model of inherited photoreceptor degeneration. *J Neurosci.* 2008 Dec 24;28(52):14282-92. doi: 10.1523/JNEUROSCI.4968-08.2008.
 11. Damiani D, Alexander JJ, O'Rourke JR, McManus M, Jadhav AP, Cepko CL, Hauswirth WW, Harfe BD, Strettoi E. Dicer inactivation leads to progressive functional and structural degeneration of the mouse retina. *J Neurosci.* 2008 May 7;28(19):4878-87.
 12. Gargini C, Terzibasi E, Mazzoni F, Strettoi E. Retinal organization in the retinal degeneration 10 (rd10) mutant mouse: a morphological and ERG study. *J Comp Neurol.* 2007 Jan 10;500(2):222-38.
 13. Oh EC, Khan N, Novelli E, Khanna H, Strettoi E, Swaroop A. Transformation of cone precursors to functional rod photoreceptors by bZIP transcription factor NRL. *Proc Natl Acad Sci U S A.* 2007 Jan 30;104(5):1679-84.
 14. Strettoi E, Mears AJ, Swaroop A. Recruitment of the rod pathway by cones in the absence of rods. *J Neurosci.* 2004 Aug 25;24(34):7576-82.
 15. Marc RE, Jones BW, Watt CB, Strettoi E. Neural remodeling in retinal degeneration. *Prog Retin Eye Res.* 2003 Sep;22(5):607-55.
 16. Strettoi E, Porciatti V, Falsini B, Pignatelli V, Rossi C. Morphological and functional abnormalities in the inner retina of the rd/rd mouse. *J Neurosci.* 2002 Jul 1;22(13):5492-504. *Strettoi E, Pignatelli V. Modifications of retinal neurons in a mouse model of retinitis pigmentosa. *Proc Natl Acad Sci U S A.* 2000 Sep 26;97(20):11020-5.
 17. Chierzi S, Strettoi E, Cenni MC, Maffei L. Optic nerve crush: axonal responses in wild-type and bcl-2 transgenic mice. *J Neurosci.* 1999 Oct 1;19(19):8367-76.
 18. Strettoi E, Masland RH. The number of unidentified amacrine cells in the mammalian retina. *Proc Natl Acad Sci U S A.* 1996 Dec 10;93(25):14906-11.
 19. Strettoi E, Masland RH. The organization of the inner nuclear layer of the rabbit retina. *J Neurosci.* 1995 Jan;15(1 Pt 2):875-88.
 20. Strettoi E, Dacheux RF, Raviola E. Synaptic connections of rod bipolar cells in the inner plexiform layer of the rabbit retina. *J Comp Neurol.* 1990 May 15;295(3):449-66.

D. Ongoing Research Support

2019-22: Pharmacological strategies for mutation-independent treatments of Retinitis Pigmentosa. Velux Stiftung Foundation, Switzerland. In collaboration with MC Gargini (Department of Pharmacy, University of Pisa) and A. Cattaneo (Scuola Normale Superiore, Pisa)

2015-19: In the eye of the observer: Visual processing at the heart of the retina (Switchboard). European Union-2020 Innovative Training Network, Marie Curie Action, ETN (Coordinated by Thomas Euler, University of Tubingen, Germany)

Completed Research Support (selection)

2015-2019 Slowing down Retinitis Pigmentosa with a mutation-independent approach: in vivo assessment on

multiple animal models. Fondazione Roma (ITALY) (In collaboration with MC Gargini (Department of Pharmacy, University of Pisa) and R. Ghidoni (San Paolo Medical School, University of Milan, Italy)

2013-2018: Sphingolipid ceramide signaling in retinal degeneration: in vivo targeting.

Macula Vision research Foundation (USA) Fondazione Roma (ITALY) (In collaboration with MC Gargini (Department of Pharmacy, University of Pisa) and R. Ghidoni (San Paolo Medical School, University of Milan, Italy)

2011-13: Environmental Enrichment: a new, non-invasive approach, to slow down photoreceptor degeneration in Retinitis Pigmentosa. **Velux Stiftung Foundation, Switzerland**

2007-2009: Targeting ceramide signaling to prevent photoreceptor degeneration.

British Retinis Pigmentosa Society, London, GB Fondazione Roma (ITALY) (In collaboration with MC Gargini (Department of Pharmacy, University of Pisa) and R. Ghidoni (San Paolo Medical School, University of Milan, Italy)

2006-2010: Inner retinal neurons in normal and degenerating mice (R01 EY12654.II)

National Eye Institute, National Institute of Health NIH, USA

2001-2005: Inner retinal neurons in normal and degenerating mice (R01 EY12654.I)

National Eye Institute, National Institute of Health NIH, USA

1999-2002: Modification of inner retinal neurons in Retinitis Pigmentosa. Telethon project E0.833



Enrica Stretto

Pisa, October 23, 2019