

Claudio Punzo, Ph.D.

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Education

- Ph.D., (Cell Biology), University of Basel, Basel, BS, Switzerland 2001
Thesis Title: Functional analysis of *Pax-6* genes during eye development and evolution.
Advisor: Dr. Walter J. Gehring
- B.S., (Cell Biology), Biozentrum University of Basel, Basel, Switzerland 1997
Thesis Title: Regulation of temperature-induced heat shock reaction of *Drosophila ambigua* and *Drosophila melanogaster*.
Advisor: Dr. Walter J. Gehring

Postdoctoral Training

- Postdoctoral Fellow/Scholar 2002-2010
Supervisor: Constance L. Cepko
Department of Genetics, Harvard Medical School, Boston, MA

Academic Appointments

- Associate Professor 6/2021-present
Vice Chair of Research
Department Ophthalmology & Visual Sciences
University of Massachusetts Medical School, Worcester, MA
- Tenure Promotion April 2021
Department Ophthalmology & Visual Sciences
University of Massachusetts Medical School, Worcester, MA
- Affiliation: Horae Gene Therapy Center 2019-present
University of Massachusetts Medical School
- Associate Professor 2017-present
Department Ophthalmology & Visual Sciences
University of Massachusetts Medical School, Worcester, MA
- Affiliation: Department of Neurobiology 2015-present
University of Massachusetts Medical School
- Assistant Professor 2010-2017
Department Ophthalmology & Visual Sciences,
University of Massachusetts Medical School, Worcester, MA

Honors and Awards

- Recipient of Research to Prevent Blindness / American Macular Degeneration Foundation Catalyst Award for Innovative Research Approaches for AMD 2023
- Long-Term Fellowship (EMBO: European Molecular Biology Organization) 2002-2004

Updated:

Award for best Poster presentation (USGEB Young Investigator Meeting, Lausanne, Switzerland) 2001

Educational Activities

Educational Leadership, Administration and Service

- Course Coordinator, BBS 782: Tutorial: Bases of Brain Diseases. 2018-present
- Course Coordinator, Ophthalmology: Vision Seminar Series. 2016-present

Teaching Activities in Programs and Courses

- BBS 602: Prep for QE course. Small Group discussion leader (3-4 students) for 4 sessions of 2 hours per session. 2025
- BBS 820: System and Circuit Neuroscience. Role 3 classes of 90 min. each as part of a full semester course. Approximately 10 students per year. 2022-present
- Foundation Class (Gene Therapy Course). Role: Paper discussion ~ 1.5h 2022,
- BBS 760: Introduction into Neuroscience. Role: One hour lecture on visual processing from retina to brain with approximately 10-15 students. Session Title: Visual Processing. (Course is held yearly) 2014-2021
- FM 201: Brain Course for 2nd year medical students. Role: One lecture of 1 hour on the visual system for the entire medical student class. 2014
- Summer RAPS: Two hours of paper discussion for new incoming students. Approximately 10-15 students per session. 2012, 2013
- BBS 782 Tutorial: Bases of Brain Diseases. Role: One two hours session with approximately 10-15 students. Session Title: 2011-2019: Retinitis Pigmentosa; 2020-present: AMD 2011-present
- Summer Course on Gene Therapy held at the Gene Therapy Center. Role: Annual lecture on Ocular Gene Therapy: 15 students/post-docs. 2011-2014
- University of Basel (Basel, Switzerland): Teaching assistant: Lab instructor for upper division undergraduate biology course. Led course discussion section, held review sessions, designed laboratory experiments, corrected exams, held lectures for Dr. W.J. Gehring. Class size: 40 students. 1998-2000

Research Education

Graduate Student Education

- Member, Neuroscience Program 2010-present
- Member, Interdisciplinary Graduate Program 2010-present

-Qualifier Exam Committee

- Benjamin Chang (Ph.D.) 05/2026
- Anoushka Lotun (Ph.D.; Chair) 04/2025
- Ruixuan Xiao (Ph.D.; Chair) 03/2024
- Motahareh Arjomandnejad (Ph.D.; Chair) 01/2024
- Abigail McElroy (Ph.D.; Chair) 04/2023
- Mohona Gupta (Ph.D.) 70/2020
- Jillian Gallagher (Ph.D.; Chair) 06/2020
- Huang Wenjia (Ph.D.) 06/2020
- Dominic Gessler (Ph.D.) 10/2018
- Neda Baniasadi (Ph.D.) (UMass Lowell) 09/2016
- Leticia Fridman (Ph.D.) 06/2013

- Ozge Yildiz (Ph.D.) 04/2013
- Alisha Gruntman (Ph.D.) 03/2012
- Subhadeep Ray (Ph.D.) 06/2011
- Michael Whalen (M.S.) 05/2011

-Thesis Defense Exam Committee (DEC):

- Motahareh Arjomandnejad (Ph.D.; Chair) 12/2025
- Thomas Leland (Ph.D., Chair) 12/2025
- Mohona Gupta (Ph.D., Chair) 03/2024
- Anastasia Schultz (Ph.D) 08/2023
- Dominic Gessler (Ph.D.) 10/2020
- Ozge Yildiz (Ph.D) 03/2019
- Neda Baniasadi (Ph.D.) (Umass Lowell) 02/2017
- Alisha Gruntman (Ph.D.) 11/2016
- Diane Golebiowski (Ph.D) 10/2016
- Sourav Chouhury (Ph.D.) 01/2016
- Rory Coffey (Ph.D.) (Brandeis University) 08/2015
- Michael Whalen (M.S.) 06/2011

-Thesis TRAC committee:

- Priya Hegde (Ph.D.; Chair) 2026-present
- Anoushka Lotun (Ph.D.; Chair) 2025-present
- Ruixuan Xiao (Ph.D.; Chair) 2024-present
- Motahareh Arjomandnejad (Ph.D.; Chair) 2024-2025
- Abigail McElroy (Ph.D.; Chair) 2023-present
- Thomas Leland (Ph.D.; Chair) 2021-2025
- Colin King (M.S.), (Montana State University) 2021-2023
- Anastasia Schultz (Ph.D.), (Montana State University) 2021-2023
- Mohona Gupta (Ph.D.; Chair) 2021-2024
- Dominic Gessler (Ph.D.) 2018-2020
- Ozge Yildiz (Ph.D.) 2013-2019
- Diane Golebiowski (Ph.D.) 2012-2016
- Alisha Gruntman (Ph.D.) 2012-2016

External Educational Activities

- **University of Houston** (Houston, TX, USA): Retinal Vascular Pathologies and potential long-term treatments. Guest lecturer (Drug Delivery and Design course; ~10 students) 03/2022
- **University of Houston** (Houston, TX, USA): Metabolism of the retina and the RPE in health and disease. Guest lecturer (Bioe 4311-01; ~15 students) 09/2020
- **University of Connecticut** (Storrs, CT, USA): The discovery of ectopic eyes: A retrospective view. Role: Invited speaker for lecture within a course. 11/2013
- **Becker College** (Leicester, MA, USA): Use of animals in research. Role: One 45 min lecture on the use of animals in research. 04/2013

- **Harvard Medical School** (Boston, MA, USA): Ocular Gene Therapy. 12/2010
Role: Invited speaker for a 2 hour lecture on the use of gene therapy for eye diseases within a course that focuses on gene therapy.

Advising and Mentoring

Students

-Ph.D. students GSBS Program (Role: Mentor)

- Delaney Giguere, GSBS Ph.D. Student 2025-present
- Shun-Yun Cheng (Michelle), GSBS Ph.D. Student 2016-2021
- Aditya Venkatesh, GSBS Ph.D. Student (Recipient of GSBS student mentoring award in 2013; GSBS Class speaker at graduation ceremony in 2016) 2011-2016
- Shan Ma, Ph.D., Exchange student from China who did Ph.D. work in my lab and graduated in May 2015. 2011-2016

-Rotation Students GSBS Program (Role: Mentor)

- Benjamin Chang Spring 2025
- YiHan Lee Fall 2021
- Jarin Snyder Spring 2021
- Jonathan Jung Winter 2020
- Jiang Min Fall 2019
- MeenakshiSundaram Kumar Fall 2017
- Shun-Yun Cheng Summer 2016
- Monika Chitre Summer 2015
- Yung Hwang Winter 2013
- Maeve Tischbein Summer 2012
- William Monis Spring 2011
- Aditya Venkatesh Spring 2011

-Research Pathway for UMass Med Students:

- Adrial Wong 2025
- Isreal Adam 2024
- WenTing Zhang 2024
- Adrienne Conza 2023
- Ilana Silverstein 2023

- Visiting summer high school student: Aditi Dosi (Role: Mentor) 2022
- Visiting student: Samson Jolly (M.D./Ph.D), working 3 months in lab 2021-2022
- Visiting M.D. student: Nicholas Belizaire (Role: Mentor) 2021-2022
- Course: Medical Student Summer Research Program: Olivia Mallari (Role: Mentor). 06-08/2018
- Course: Medical Student Summer Research Program: Viswanath Ramaswamy. (Role mentor) 06-08/2014
- Course MDP 740B: Individual Student Mentoring: Eric Schmidt. (Role: Mentor) 03-04/2014

- Harvard Medical School: 2003-2007
 - Student Mentoring for BBS graduate Program: Knatokie Ford, Huchung Chung
 - Student Mentoring for HHMI Summer student Program: Danielle Andrews-Lovell
 - Student Mentoring for Harvard Work Study Program: Soledad Jorge

Postdoctoral Trainees

- Shun-Yun Cheng, Ph.D.; Role: Mentor 2021-2025
- Lolita Petit, Ph.D.; Role: Mentor 2014-2017
- Marina Zieger, Ph.D.; Role: Mentor 2013-2016
- Fernanda Langelotto, Ph.D.; Role: Mentor 2010-2012

Research Associates

- Disha Khanna; Role Mentor 2025-2026
- San Kim; Role: Mentor 2024-2025
- Delaney Giguere; Role: Mentor 2023-2025
- Anneliese Malachi; Role: Mentor 2019-2023
- Joris Cipi; Role: Mentor 2017-2019
- Chantelle LaFond; Role: Mentor 2010-2012

Investigation

Grants

Current

- Research to Prevent Blindness/American Macular Degeneration Catalyst Award 2023-2027
 Claudio Punzo (Role: PI, Anastasia Khvorova, Co-PI)
 Title: Development of Stable siRNA therapeutics for the treatment of neovascular AMD
 Total direct costs: US\$ 300,000 (Total direct cost for Punzo Lab 156,448)
 Role: PI
- 1R01EY032461-01, NEI 2021-2026
 Claudio Punzo (Role: PI)
 Title: Identifying the cause for photoreceptor-mediated retinal-pigmented epithelium atrophy.
 Total direct costs: US\$ 1,250,000

Completed

- Kang Hong Pharmaceutical 2021-2023
 Claudio Punzo (Role: Co-Pi with Guangping Gao)
 Title: AAV vector based in vivo delivery of therapeutic genes to retina for the treatment of ophthalmic disorders.
 Total direct cost: US\$ 790,010 (Total direct cost for Punzo Lab: US\$ 113,070)
- M2020016, BrightFocus Foundation for Macular Degeneration 2020-2022
 Claudio Punzo (Role: PI)
 Title: Elucidating how smoking contributes to AMD
 Total direct costs: US\$ 185,000

1R21EY031130-01, NEI Frances Lefcort (Role: Co-PI; Total direct cost for Punzo Lab: US\$ ~40,000) Title: Therapeutic strategies for mitigating loss of retinal ganglion cells in familial dysautonomia. Total direct costs: US\$ 275,000	2020-2022
1R21EY030166-01, NEI Claudio Punzo (Role: PI) Title: Testing the role of glucose deprivation during secondary cone death in retinitis pigmentosa. Total direct costs: US\$ 275,000	2019-2021
Kang Hong Pharmaceutical Claudio Punzo (Role: Co-Pi with Guangping Gao) Title: AAV vector based in vivo delivery of therapeutic genes to retina for the treatment of ophthalmic disorders. Total direct cost: US\$ 2,041,093 (Total direct cost for Punzo Lab: US\$ 435,930)	2018-2021
M2017071, BrightFocus Foundation for Macular Degeneration Claudio Punzo (Role: PI) Title: Role of photoreceptors in age-related macular degeneration Total direct costs: US\$ 160,000	2017-2019
Massachusetts Lions Eye Research Fund Inc. Claudio Punzo (Role: PI) Title: Prolonging vision in Age-related Macular degeneration Total, direct & indirect costs: \$ 15,333	2015-2016
International Retinal Research Foundation (IRRF) Claudio Punzo (PI) Title: Modulation of the mTOR pathway: A novel approach to extend vision in dry Age-related macular degeneration. Total, direct & indirect costs: \$99,685 Role: PI	2014-2015
International Retinal Research Foundation (IRRF) Claudio Punzo (PI) Title: Modulation of the mTOR pathway: A novel approach to extend vision in dry Age-related macular degeneration. Total, direct & indirect costs: \$96,450 Role: PI	2013-2014
1R01EY023570, NEI Claudio Punzo (Role: PI) Title: Delaying cone death in retinitis pigmentosa. Total direct costs: US\$ 1,250,000	2013-2019

Scholarship

Peer-reviewed publications

- Cheng S.Y., Giguere D., Kim S., Seddon J.M., Caiazzi J., Gross K., McHugh N., Echeverria D., Alterman J.F., Gray-Edwards H., Benatti H.R., Renner L., Woolard H., Stoddard J., McGill T.J., Neuringer M., Brush R.S., Agbaga M.P., Khvorova A., **Punzo C.** (2026) A siRNA targeting *S6k1* identifies photoreceptor phospholipid metabolism as a contributor to lipid buildup in age-related macular degeneration. *Molecular Therapy Nucleic Acids*: 37, (2), [102878](#).
- Cui M., Cheng S.Y., Liang J., McGowan J., Xu M., Xu G., Luo L., Wu J., Harman C.D., Jacobson A.L., Kapeller L.E., Mayes M.A., Namkung S., Sharma T., Leland T.B., Zhang F., Yip M., Rossmiller B., Xue T., Chen X., Boonying W., Lotun A., Wang D., Su Q., Xie J., Wei Y., Rothstein A.M., Gregory-Ksander M.S., Komaromy A., Tian B., Lin H., **Punzo C.**, Tai P.W.L., Gao G. (2026). Modification of the VP1u region boosts transduction of adeno-associated virus vectors for ocular gene therapy. *Molecular Therapy*: 34 (5) (PMID: 41618563)

3. Lonfat N., Moreno-Leon L., **Punzo C.**, Khanna H. (2025). Update on Gene Therapy Clinical Trials for Eye Diseases. **Human Gene Therapy**: 46, (19-20), 1283-1286.
4. Cheng S.Y., Giguere D., Silverstein I., Conza A., Seddon J.M., Kim S., Iwata T., Mueller C., **Punzo C.** (2025). Role of alpha-1 antitrypsin in Bruch's membrane integrity. **Scientific Reports**: 15, Article number: 12223.
5. Wang J.H., Cui M., Liu H., Guo P., McGowan J., Cheng S.Y., Gessler D., Xie J., **Punzo C.**, Tai P.W.L., Gao G. (2025). Cell-penetrating peptide-grafted AAV2 capsids for improved retinal delivery via intravitreal injection. **Molecular Therapy Methods & Clinical Development**: 33, (1) 1-12.
6. Cui M., Su Q., Yip M., McGowan J., **Punzo C.**, Gao G., Tai P.W.L. (2024). The AAV2.7m8 capsid packages a higher degree of heterogeneous genomes than AAV2. **Gene Therapy**: 31, 489-498 <https://doi.org/10.1038/s41434-024-00477-7>.
7. Cheng S.Y., **Punzo C.** (2024). New Insights into AMD Pathogenesis. In: Prakash, G., Iwata, T. (eds) *Advances in Vision Research, Volume IV. Essentials in Ophthalmology*. Springer, Singapore. https://doi.org/10.1007/978-981-99-4436-1_12.
8. Seddon J.M., De. D., Casazza W., Cheng S.Y., **Punzo C.**, Daly M., Zhou D., Coss S.L., Atkinson J.P., Yu C.Y. (2024). Risk and protection of different protein coding variants of complement component C4A in age-related macular degeneration. **Frontiers in Genetics**: 14: 1274743
9. Cheng S.Y., Caiazzi J., Biscans A., Alterman J.F., Echeverria D., McHugh N., Hassler M., Jolly S., Giguere D., Cipi J., Khvorova A., **Punzo C.** (2023). Single intravitreal administration of a tetravalent siRNA exhibits robust and efficient gene silencing in rodent and swine photoreceptors. **Molecular Therapy Nucleic Acid**: 35, (1), 102088.
10. Schultz A., Cheng S.Y., Kirchner E., Costello S., Miettien H., Chaverra M., King C., George L., Zhao X., Narasimhan J., Weetall M., Slangenaupt S., Morini E., **Punzo C.**, Lefcort F. (2023). Reduction of retinal ganglion cell death in mouse model of familial dysautonomia using AAV-mediated gene therapy and splicing modulators. **Scientific Reports**: 13: 186000.
11. Huan T., Cheng S.Y., Tian B., **Punzo C.**, Lin H., Daly M., Seddon J.M. (2023). Identifying Novel Genes and Variants in Immune and Coagulation Pathways Associated with Macular Degeneration. **Ophthalmology Science**: 3 (1): 100206
12. Cheng S.Y, **Punzo C.** (2022). Update on Viral gene Therapy Trials for Retinal Diseases. **Human Gene Therapy**: 33 (17-18): 865-878.
13. Wang Y., **Punzo C.**, Ash J.D., Lobanova E.S. (2022). Tsc2 knockout counteracts ubiquitin-proteasome system insufficiency and delays photoreceptor loss in retinitis pigmentosa. **PNAS**: 119 (11): 2118479119.
14. Cheng S.Y, **Punzo C.** (2021). Ocular Inflammation with Anti-Vascular Endothelial Growth Factor Treatments. **Human Gene Therapy**: 32 (13-14): 639-641.
15. Cheng S.Y, Luo Y., Malachi A., Ko J., Su Q., Xie J., Tian B., Lin H., Ke X., Zheng Q., Tai P.L.W., Gao G., **Punzo C.** (2021). Low-Dose Recombinant Adeno-Associated Virus-Mediated Inhibition of Vascular Endothelial Growth Factor Can Treat Neovascular Pathologies Without Inducing Retinal Vasculitis. **Human Gene Therapy**: 32 (13-14): 649-666.
16. Cheng S.Y., Malachi A., Cipi J., Ma S., Brush R.S., Agbaga M.P., **Punzo C.** (2021). HK2 mediated glycolytic metabolism in mouse photoreceptors is not required to cause late stage age-related macular degeneration-like pathologies. **Biomolecules**: 2021, 11, 871.
17. Cheng S.Y., Cipi J., Ma S., Hafler B.P., Kanadia R.N., Brush R.S., Agbaga M.P., **Punzo C.** (2020). Altered photoreceptor metabolism in mouse causes late stage age-related macular degeneration like pathologies. **PNAS**: 117 (23): 13094-13104 (2020).
18. Li H., Li Q., Dang K., Ma S., Cotton J.L., Yang S., Zhu L.J., Deng A.C., Ip Y.T., Johnson R.L. Wu X., **Punzo C.**, Mao J. (2019). YAP/TAZ activation drives uveal melanoma initiation and progression. **Cell Reports**: 29(10): 3200-3211.
19. Petit L., Ma S., Cipi J., Cheng S.Y., Zieger M., Hay N., **Punzo C.** (2018). Aerobic glycolysis is essential for normal rod function and control secondary cone death in retinitis pigmentosa. **Cell Reports**: 23(9): 2629-2642.
20. Venkatesh A., Cheng S.Y., **Punzo C.** Loss of the cone-enriched caspases-7 does not affect secondary cone death in retinitis pigmentosa. **Molecular Vision**: 23: 944-951 (2017).

21. Petit L., Ma S., Cheng S.Y., Gao G., **Punzo C.** (2017). Rod outer segment development influences AAV-mediated photoreceptor transduction after subretinal injection. *Human Gene Therapy*: 28 (6): 464-481 (2017).
22. Petit L. & **Punzo C.** (2016). Gene Therapy Approaches for the Treatment of Retinal Disorders. *Discovery Medicine*: 22 (121).
23. Camacho E.T., **Punzo C.**, Wirkus S.A. Quantifying the metabolic contribution to photoreceptor death in retinitis pigmentosa via a mathematical model. *Journal of Theoretical Biology*: 408: 75-87 (2016).
24. Venkatesh A., Ma S., **Punzo C.** TSC but not PTEN loss in starving cones of retinitis pigmentosa mice leads to an autophagy defect and mTORC1 dissociation from the lysosome. *Cell Death & Disease*: 7 (6): e2279 (2016)
25. Petit L., Khanna H., **Punzo C.** Advances in gene Therapy for Diseases of the Eye. *Human Gene Therapy*: 27 (8): 563-579 (2016).
26. Choudhury S.R., Fitzpatrick Z., Harris A.F., Maitland S.A., Ferreira J.S., Zhang Y., Ma S., Sharma R.B., Gray-Edwards H.L., Johnson J.A., Johnson A.K., Alonso L.C., **Punzo C.**, Wagner K.R., Maguire C.A., Kotin R.M., Martin D.R., Sena-Esteves M. (2016) *In vivo* selection yields AAV-B1 capsid for CNS and muscle gene therapy. *Molecular Therapy*: 24 (7): 1247-1257 (2016).
27. Zieger M. & **Punzo C.** Improved cell metabolism prolongs photoreceptor survival upon retinal-pigmented epithelium loss in the sodium iodate induced model of geographic atrophy. *Oncotarget*: 7 (9): 9620-9633 (2016).
28. Petit L. & **Punzo C.** mTORC1 sustains vision in retinitis pigmentosa. *Oncotarget*: 6 (19): 16786-16787 (2015).
29. Cepko C.L. & **Punzo C.** Sugar for Sight. *Nature*: 522 (7557): 428-29 (2015).
30. Ma S., Venkatesh A., Langellotto F., Le Y. Z., Hall M. N., Ruegg M. A., **Punzo C.** Loss of mTOR signaling affects cone function, cone structure and expression of cone specific proteins without affecting cone survival. *Exp. Eye Res*: 135: 1-13 (2015).
31. Venkatesh A., Ma S., Le Y. Z., Hall M. N., Ruegg M. A., **Punzo C.** Activated mTORC1 promotes long-term cone survival in retinitis pigmentosa mice. *J of Clin. Inves.*: 125 (4): 1446-58 (2015).
32. Banday A.R., Baumgartner M., Al Seesi S., Karunakaran D.K., Venkatesh A., Congdon S., Lemoine C., Kilcollins A.M., Mandoiu I., **Punzo C.**, Kanadia R.N. Replication-dependent histone genes are actively transcribed in differentiating and aging retinal neurons. *Cell Cycle*: 13 (16): 2526-2541 (2014).
33. Venkatesh A., Ma S., Langellotto F., Gao G., **Punzo C.** Retinal gene delivery by rAAV and DNA electroporation. *Current Protocol*: Chapter 14: Unit 14D.4 (2013).
34. Molnar T., Barabas P., Birnbaumer L., **Punzo C.**, Kefalov V., Krizaj D. Store-operated channels regulate intracellular calcium in mammalian rods. *J. of Physiol.*: 590 (15): 3465-3481 (2012).
35. Hafler B.P., Surzenko N., Beier K.T., **Punzo C.**, Trimarchi J.M., Kong J.H., Cepko C.L. (2012) Transcription factor Olig2 defines subpopulations of retinal progenitor cells biased toward specific cell fates. *Proc. Natl. Acad. Sci.*: 109 (20): 7882-7887 (2012).
36. **Punzo C.**, Xiong W, Cepko C.L. Loss of daylight vision in retinal degeneration: are oxidative stress and metabolic dysregulation to blame? *J. of Bio. Chem.*: 287 (3): 1642-1648 (2012).
37. Huang W, Xing W, Ryskamp DA, **Punzo C**, Krizaj D. Localization and phenotype-specific expression of ryanodine calcium release channels in C57BL6 and DBA/2J mouse strains. *Exp. Eye Res.*: 93 (5): 700-709 (2011).
38. Krizaj D., Huang W., Furukawa T., **Punzo C.**, Xing W. Plasticity of TRPM1 expression and localization in the wild type and degenerating mouse retina. *Vision Res.*: 50 (23): 2460-2465 (2010).
39. **Punzo C.**, Kornacker K., Cepko C.L. Stimulation of the insulin/mTOR pathway delays cone death in a mouse model of Retinitis Pigmentosa. *Nature Neuroscience*: 12 (1): 44-52 (2009).
40. Kanadia R.N., Clark V.E., **Punzo C.**, Trimarch J., Cepko C.L. Temporal requirement of the alternative splicing factor Sfrs1 for the survival of retinal neurons. *Development*: 135: 3922-33 (2008).
41. Plaza S., Prince F., Adachi Y., **Punzo C.**, Cribbs D., Gehring W.J. Cross-regulatory Protein-Protein Interactions between Hox and Pax Transcription factors. (2008) *Proc. Natl. Acad. Sci*: 13439-44 (2008).

42. **Punzo C.**, and Cepko C.L. (2008) Ultrasound-guided *in utero* injections allow studies of ocular development and function. ***Developmental Dynamics***: 237 (4): 1034-42 (2008).
43. Liu F., Jenssen T.K., Trimarchi J., **Punzo C.**, Cepko C.L., Ohno-Machado L., Hovig E., Patrick Kuo W. Comparison of hybridization-based and sequencing-based gene expression technologies on biological replicates. ***BMC Genomics***: 8: 153 (2007).
44. **Punzo C.**, and Cepko C.L. Cellular responses to photoreceptor death in the rd1 mouse model of retinal degeneration. ***Invest Ophthalmol Vis Sci***: 48 (2): 849-857 (2007).
45. Kuo W.P., Liu F., Trimarchi J., **Punzo C.**, Lombardi M., Sarang J., Whipple M.E., Maysuria M., Serikawa K., Lee S.Y., McCrann D., Kang J., Shearstone J.R., Burke J., Park D.J., Wang X., Rector T.L., Ricciardi-Castagnoli P., Perrin S., Choi S., Bumgarner R., Kim J.H., Short G.F. 3rd, Freeman M.W., Seed B., Jensen R., Church G.M., Hovig E., Cepko C.L., Park P., Ohno-Machado L., Jenssen T.K. A sequence-oriented comparison of gene expression measurements across different hybridization-based technologies. ***Nat Biotechnol***: 24 (7): 832-840 (2006).
46. **Punzo C.**, Plaza S., Seimiya M., Schnupf P., Kurata S., Jaeger J., and Gehring W.J. Functional divergence between *eyeless* and *twine of eyeless* in *Drosophila melanogaster*. ***Development***: 131 (16): 3943-53 (2004).
47. **Punzo C.**, Seimiya M., Gehring W.J., and Plaza S. (2002) Differential interaction of *eyeless* and *twine of eyeless* with the *sine oculis* enhancer. ***Development***: 129 (3): 625-34 (2002).
48. **Punzo C.**, Kurata S., and Gehring W.J. (2001) The *eyeless* homeodomain is dispensable for eye development in *Drosophila*. ***Genes & Development***: 15: 1716-1723 (2001).

Books & Chapters

1. **Punzo C.** Gene Therapy in Animal Models. (Book Chapter; Book title: genetics and Genomic of eye diseases). Publisher: **Elsevier**. ISBN: 978012816222-4. Published: 09/13/2019.
2. Cheng S.Y., **Punzo C.** (2024). New Insights into AMD Pathogenesis. In: Prakash, G., Iwata, T. (eds) *Advances in Vision Research, Volume IV. Essentials in Ophthalmology*. Springer, Singapore. https://doi.org/10.1007/978-981-99-4436-1_12.

Patents

Identification of VEGFA target sequences for the treatment of neovascular eye pathologies by siRNA	2025
Use of modified siRNA chemistry for efficient targeting of genes expressed in different cell types of the eye.	2022
Oligonucleotides targeting S6K1	2022
Adeno-Associated virus for delivery of KH902 and uses thereof (US63/179,700)	2021
Inhibition of S6K1 for the treatment and prevention of AMD.	2020
Adeno-associated virus vector platform for delivery of KH902	2019
Methods for inhibiting starvation of a cell (US2010/031211)	2010

Invited Presentations

International

- Role of photoreceptors in AMD pathogenesis. ISER Biennial Meeting, Gold Coast, Queensland, Australia. 02/20/2023
- siRNA-mediated Therapy for the prevention of age-related macular degeneration. ARVO meeting: Revolutionary Eye and Vision Research (on Zoom). Speaker in SIG (Special Interest Group): New Drug Therapeutics for Inherited Retinal Degeneration Diseases (IRDs). 05/04/2021
- Unraveling Age-related macular degeneration. Wet AMD & DME Drug Development Summit (Organizer: Hasonwade; Online). Premeeting workshop on "Developing Preclinical Models for Wet AMD & DME". 04/13/2021

- Role of aerobic glycolysis in photoreceptors. ISER Biennial Meeting, Belfast, Northern Ireland, UK. 09/12/2018
- The duality of mTORC1 in promoting cone survival in Retinitis Pigmentosa. ISER Biennial Meeting, Tokyo, Japan. 09/29/2016
- Prolonging Cone survival in Retinitis Pigmentosa. ISER Biennial Meeting, San Francisco, California, USA. 07/20/2014
- The mechanism of disease pathogenesis in Retinitis Pigmentosa. Meeting on Evolution of Vision, Les Treilles, France. 06/09/2009
- Starvation: A new mechanism for cone death in Retinitis Pigmentosa. ARVO meeting: Reducing disparities in eye disease and treatment. Florida, Fort Lauderdale USA. 05/07/2009
- Understanding rod mediated cone death. Twelfth annual Vision Research conference: Mechanism of macular degeneration. Florida, Fort Lauderdale, USA. 05/01/2009
- Rod toxin and rod trophic factor in Retinitis Pigmentosa. ARVO meeting: Visual Prostheses Research. Florida, Fort Lauderdale USA. 05/14/2008
- The rod toxin and rod trophic factor hypothesis in Retinitis Pigmentosa. University of Basel, Basel, Switzerland. 12/17/2007
- *Pax-6* function during development and evolution. IDAC Summer Workshop on Developmental Biology, Sendai, Japan. 07/14/2001

National

- New insights into the progression of Age-related Macular Degeneration. Kellogg Eye Center, Ann Arbor, Michigan, USA. 04/02/2026
- Photoreceptor phospholipids in AMD disease progression. Metabolism data club, Zoom presentation 11/12/2025
- Understanding Disease Progression in AMD. Cole Eye Institute at Cleveland Clinic, Cleveland, OH, USA. 12/12/2024
- Age-related Macular Degeneration: From Humans to mice. University of Texas at San Antonio (UTSA), San Antonio, TX, USA. 11/14/2024
- The role of Photoreceptor in AMD Pathogenesis. Oakland University, Rochester, MI, USA. In person and over Zoom. 12/12/2023
- Photoreceptor Metabolism in AMD Pathogenesis. National Eye Institute, Bethesda, USA. Retinal Disease Interest Group (RDIG) seminar series in person and over Zoom. 12/15/2022
- Role of Photoreceptor Metabolism in Retinal Diseases. Online Zoom; University of Iowa, USA 11/04/2021
- Photoreceptor metabolism in AMD. Online Zoom presentation to Metabolic data club during Covid-19 Pandemic in lieu of meetings. 05/18/2020
- Aerobic Glycolysis in retinal diseases. University of Florida, Gainesville, Florida, USA. 10/16/2019
- Aerobic Glycolysis in retinal diseases. FASEB Meeting, Steamboat Springs, Colorado, USA. 06/25/2019
- Mechanism of cone protection in Retinitis Pigmentosa. FASEB Meeting, Big Sky, Montana, USA. 06/18/2015
- Prolonging cone survival in Retinitis Pigmentosa. Department of Ophthalmology, University of Oklahoma Health and Science Center, Oklahoma City, OK, USA 11/21/2013
- Mechanism of disease pathogenesis in Retinitis Pigmentosa. National Eye Institute, Bethesda, MD, USA. 06/23/2009
- Mechanism of disease pathogenesis in Retinitis Pigmentosa. University of North Carolina, Chapel Hill, NC, USA. 05/11/2009
- Mechanism of disease pathogenesis in Retinitis Pigmentosa. Yale Eye Center, New Haven, CT, USA. 02/25/2009

- Retinitis Pigmentosa: The mechanism of disease pathogenesis. Wright State University, Dayton, OH, USA. 02/20/2009
- Prolonging vision in Retinitis Pigmentosa by saving cones. Washington University School of Medicine, St Louis, MO, USA 06/26/2008
- Prolonging vision in Retinitis Pigmentosa by saving cones. Moran Eye Center, Salt Lake City, UT, USA. 06.03/2008
- From light to genetic inherited eye diseases. 41st SBAO (Swiss Ophthalmology Association) Conference. Bern, Switzerland. 03/19/2001

Regional

- Understanding and Treating Age-related Macular Degeneration. University of Connecticut, Department of Physiology and Neurobiology, Storrs, CT, USA 03/25/2026
- Photoreceptor phospholipids in AMD disease progression. Tufts University, Dept. of Ophthalmology, Boston, MA, USA. Grand Rounds 11/13/2025
- Insulin signaling in rods and cones: Lessons for diabetic retinopathy and age-related macular degeneration. Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA, USA, 07/26/2016
- Mechanism of disease pathogenesis in Retinitis Pigmentosa. Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA, USA. 03/27/2009
- The *eyeless* homeodomain is dispensable for eye development in *Drosophila*. Swiss Drosophila Meeting, Fribourg, Switzerland. 03/31/2001
- The *eyeless* homeodomain is dispensable for eye development in *Drosophila*. Regional Meeting, Freiburg, Germany). 03/02/2001

Local

- A new treatment Paradigm for Age-related Macular Degeneration. Department of Genetics and cellular Medicine, UMass Chan Medical School, Worcester, MA, USA. 03/23/2026
- How to tackle Age-related Macular Degeneration. Neurobiology Seminar Series, Department of Neurobiology, UMass Chan Medical School, Worcester, MA 05/22/2025
- Understanding Age-related Macular Degeneration. Vision Seminar Series, Department of Ophthalmology, UMass Chan Medical School, Worcester, MA, USA. 01/16/2025
- Unraveling Photoreceptor Metabolism in AMD pathogenesis. Vision Seminar Series, Department of Ophthalmology, UMass Chan Medical School, Worcester, MA, USA. 01/12/2023
- Unraveling the underlying cause for blindness in retinitis pigmentosa. Neuroscience of Disease Forum seminar series, UMass Medical School, Worcester, MA, USA. 10/25/2018
- The Theory of everything: Why, where and what causes Age-related Macular Degeneration to develop. Albert Biology Colloquium (ABC seminar series), UMass Medical School, Worcester, MA USA 02/09/2018
- Retinitis Pigmentosa: from disease to treatment. UMass Neuroscience Seminar Series 09/08/2016
- Insulin signaling in rods and cones: Lessons for diabetic retinopathy and age-related macular degeneration. UMass Vision Seminar Series, Worcester, MA, USA. 08/18/2016
- Delaying Vision loss in Retinitis Pigmentosa. Albert Biology Colloquium (ABC seminar series), UMass Medical School, Worcester, MA USA. 11/14/2014

Other Presentations, Posters & Abstracts

International

- Conza A., Silverstein I., Giguere D., Cheng S.Y., **Punzo C.** Role of Alpha-1 antitrypsin in ocular health. ARVO: 2024, Seattle Washington. Revolutionary (Investigative Ophthalmology & Visual Science 65 (7), 1296-1296). 05/05/2024

- Cheng S.Y., Echeverria D., Giguere D., Alterman A., Agbaga M.P., Seddon J., Khvorova A., **Punzo C.** Genetic and pharmacological reduction of S6K1 alleviates pathologies in the mouse model of age-related macular degeneration (AMD). ARVO: 2024, Seattle Washington. Revolutionary (Investigative Ophthalmology & Visual Science 65 (7), 6519-6519). 05/09/2024
- Silverstein I., Conza A., Giguere D., Alterman A., Echeverria D., Gross K., Cheng S.Y., Khvorova A., **Punzo C.** siRNA mediated gene silencing of Vasculae Endothelial Growth Factor (VEGF) for the treatment of neovascular pathologies of the eye. ARVO: 2024 Seattle, Washington (Investigative Ophthalmology & Visual Science 65 (7), 236-236). 05/05/2024
- Cheng S.Y., Tai P., Malachi A., Zheng Q., Ke X., Tian B., Lin H., Gao G., **Punzo C.** Low-dose rAAV-mediated inhibition of VEGF can treat neovascular pathologies without inducing retinal vasculitis. ARVO: Revolutionary Eye and Vision Research. (Investigative Ophthalmology & Visual Science 62 (8), 1201-1201). 05/05/2021
- Cheng S.Y., Lou Y., Malachi A., Ko J., Su Q., Xie J., Tian B., Lin H., Ke X., Zheng Q., Tai P., Gao G., **Punzo C.** rAAV-mediated inhibition of Vascular Endothelial Growth Factor for the treatment of retinal vascular pathologies without causing vasculitis. ASGCT Meeting. (Molecular Therapy: 29 (4): 161-162). 404/27/2021
- Cheng S.Y., Ma S., Agbaga M.P., **Punzo C.** Elucidating the role of photoreceptors in AMD pathogenesis. ARVO: From Bench to bedside and back. Vancouver, Canada. (Investigative Ophthalmology & Visual Science 60 (15), 1220-1220) 04/28/2019
- Petit L., Ma S., Cheng S.Y., Gao G., **Punzo C.** Rod outer segments influence the efficiency of AAV-mediated rod transduction. ARVO: Imaging in the eye conference. Baltimore, Maryland, USA. (Investigative Ophthalmology & Visual Science 58 (13), 4094-4094). 05/10/2017
- Venkatesh A., Ma S., **Punzo C.** Activation of mTORC1 is sufficient for long-term cone survival in retinitis pigmentosa. ARVO: Leading eye and vision research. Orlando, Florida, USA. (Investigative Ophthalmology & Visual Science 55 (13), 3985-3985). 04/30/2014
- Ma S., Venkatesh A., **Punzo C.** Loss of mTORC1 & mTORC2 but not mTORC1 or mOTRC2 leads to reduction in cone function. ARVO: Leading eye and vision research. Orlando, Florida, USA. (Investigative Ophthalmology & Visual Science 55 (13), 378-378). 04/30/2014
- Molnar T., Barabas P., **Punzo C.**, Krizaj D. Store-operated Calcium Entry Regulates Intracellular Calcium Homeostasis In Mouse Rod Photoreceptors. ARVO: Visionary Genomics. Fort Lauderdale, Florida, USA (Investigative Ophthalmology & Visual Science 52 (14), 6581-6581). 04/22/2011
- Krizaj D., Witkovsky P., Barabas P., **Punzo C.**, Renteria R. C., Liedtke W., Huang W. H. Expression and Function of TRPV4 Channels in the Vertebrate Retina. ARVO: The Future of Eye & Vision Research. Fort Lauderdale, Florida, USA (Investigative Ophthalmology & Visual Science 51 (13), 1860-1860). 04/17/2010
- Krizaj D., Huang W., Zou J., **Punzo C.**, Birnbaumer L., Barabas P. The Canonical Trpc1 Channel Modulates Rod Signals in the Mammalian Retina. ARVO: Reducing disparities in eye disease and treatment. Fort Lauderdale, Florida, USA (Investigative Ophthalmology & Visual Science 50 (13), 5177-5177). 04/28/2009
- Roesch K., Jadhav A., **Punzo C.**, Sun B., Cepko C.L. Muller glia cell response to retinal degeneration. ARVO: The aging eye. Florida, Fort Lauderdale USA (Investigative Ophthalmology & Visual Science 48 (13), 2948-2948). 05/10/2007
- **Punzo C.**, Cepko C. L. Ultrasound guided in utero gene delivery: A tool to manipulate early born retinal cell types. ARVO: The aging eye. Fort Lauderdale, Florida, USA (Investigative Ophthalmology & Visual Science 48 (13), 4603-4603). 05/10/2007
- **Punzo C.**, Cepko C. L. Distinct cellular responses to rod and cone death in the rd1 mouse model of retinal degeneration. ARVO: Building international collaborations. Fort Lauderdale, Florida, USA (Investigative Ophthalmology & Visual Science 47 (13), 5774-5774). 05/01/2006

National

- Venkatesh A., Ma S., **Punzo C.**, Applying m'TORC'1 to prolong vision in Retinitis Pigmentosa. American Society for Cell Biology (ASCB). San Diego, California, USA. 12/2015
- Venkatesh A., Ma S., **Punzo C.** mTOR signaling and autophagy in retinal disease. Autophagy Keystone Symposium. Breckenridge, Colorado, USA. 06/2015

Regional

- **Punzo C.** Preventing blindness in retinitis pigmentosa: One size fits all. inKNOWvation Gene Therapy. Cambridge, Massachusetts, USA. 05/2016

Local

- Cheng S.Y., Ma S., **Punzo C.** A paradigm-shifting hypothesis for the development of age-related macular degeneration. UMass Metabolic Meeting at Pfizer. Cambridge Massachusetts, USA. 05/2017
- Cheng S.Y., Ma S., **Punzo C.** A paradigm-shifting hypothesis for the development of age-related macular degeneration. UMass Basic Sciences Retreat 10/2016
- Venkatesh A., Ma S., **Punzo C.** Applying m'TORC'1 to prolong vision in Retinitis Pigmentosa. UMass Basic Sciences Retreat. 10/2015
- Venkatesh A., Ma S., Le Y. Z., Hall M. N., Rüegg M. A., **Punzo C.** Activation of mTORC1 is sufficient for long-term cone survival in Retinitis Pigmentosa. UMass Basic Sciences Retreat (Venkatesh: Poster Award winner). 07/2014
- Venkatesh A., **Punzo C.** Apoptotic cone cell death in retinitis pigmentosa. UMass Basic Science Retreat. 01/2013

Academic Service

Internal Administration and Service

Department

- Ophthalmology: Chair of Departmental Personnel Action Committee (DPAC) 2023-present
- Ophthalmology: Vice Chair of research appointment 2021-present
- Ophthalmology: Training and maintenance of Ophthalmology research equipment 2019-present
- Ophthalmology: Interviewed applicants for residency program 2019-2023
- Ophthalmology: Reviewed application for residency program 2019-2023
- Ophthalmology: Interviewed Faculty candidates 2017-present
- Ophthalmology: Member of Departmental Personnel Action Committee (DPAC) 2019-present
- Gene Therapy Center: Webpage design, development & maintenance 2014-2018
- Gene Therapy Center: Training & Maintenance of microscope facility of GTC. 2012-2018

School

- Multiple Mini Interviews (MMI) for prospective Medical School Students 2014-2020
- Interviews of prospective M.D./Ph.D. and Ph.D. Students for GSBS Program 2011-present
- Interviews with prospective Faculty Candidates 2010-present

Professional Memberships and Activities

- ASGCT (American Society of Gene and Cell Therapy). Member 2016-present
- ISER (International Society for Eye Research). Member 2014-present
- AAAS (American Association for the Advancement of Science). Member 2010-present
- ARVO (Association for Research in Vision and Ophthalmology). Member 2004-present

Editorial Responsibilities

- Proceedings National Academy of Sciences (PNAS), Guest Editor 2020-present
- Visual Neuroscience, Reviewer 2019-present
- Molecular Therapy, Reviewer 2018-present

NeuroReport, Reviewer	2018-present
American Journal of Physiology, Reviewer	2018-present
Science Signaling, Reviewer	2017-present
Cellular and Molecular life Science, Reviewer	2016-present
FASEB Journal, Reviewer	2016-present
Cell Death & Disease, Reviewer	2016-present
Experimental Eye Research, Reviewer	2015-present
Cell Report, Reviewer, Reviewer	2015-present
Human Gene Therapy, Reviewer	2013-present
BMC Ophthalmology, Associate Editor	2012-2022
Cold Spring Harbor Protocols, Reviewer	2012-present
PLOS One, Reviewer	2012-present
Molecular Vision, Reviewer	2012-present
BMC Ophthalmology, Reviewer	2012-present
Genomics, Reviewer	2011-present
Investigative Ophtha. & Visual Science (IOVS), Reviewer	2011-present
Journal of Neuroscience, Reviewer	2011-present
Proceedings National Academy of Sciences (PNAS), Reviewer	2011-present
Frontiers Journals, Reviewer	2009-present

External Professional Service

International

Deutsche Forschungsgemeinschaft (DFG)	07/2022
United States-Israel Binational Science Foundation	01/2022
Deutsche Forschungsgemeinschaft (DFG)	09/2021
Scientific Advisory Board: LimnoPharma (Spain)	2020-2023
Swiss National Science Foundation	06/2019
MRC United Kingdom	02/2019
Swiss National Science Foundation	06/2018
Israel Science Foundation	02/2018
Retina France	10/2017
Swiss National Science Foundation	01/2016
Swiss National Science Foundation	11/2014
Swiss National Science Foundation	01/2014

National

NIH: Ad hoc reviewer IVB Study section	04/2026
NIH: Ad hoc reviewer IVB Study section	11/2025
NIH: Ad hoc reviewer PED2 study section	03/2025
FFB: FFB: Foundation Fighting Blindness	05/2024
FFB: FFB: Foundation Fighting Blindness	12/2023
NIH: Ad hoc reviewer ZEY1 VNS	10/2023
NIH: Ad hoc reviewer BIVT study section	05/2023
NIH: Ad hoc reviewer PED1 study section	02/2022
NIH: Ad hoc reviewer for special emphasis panel	10/2020
FFB: Foundation Fighting Blindness	08/2020
NIH: Ad hoc reviewer for special emphasis panel	07/2020
NIH: Ad hoc reviewer BVS study section	02/2019
NIH: Ad hoc reviewer BNVT Study Section	02/2018
Fight for Sight: Ad hoc mail reviewer	10/2017

NIH: Ad hoc reviewer BVS Study Section

10/2017

Regional

Scientific Advisory Board: Gemini Therapeutics, Cambridge MA

2017-2020

Professional Development

- Basic training ... ABC's for IACUC & IBCs: Frameworks for compliance (UMass)
- Junior Faculty Development Program (UMass)

2013

2011-2012