

**Botond Roska MD PhD**  
**Curriculum vitae**

Born 17.12.1969

**A. Education**

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Semmelweis Medical School, Budapest, Hungary	MD, Summa Cum Laude	10/1995	Medicine
University of California Berkeley, USA	PhD	07/2002	Neurobiology
Harvard University and Harvard Medical School, USA	Harvard Society Fellow	05/2005	Genetics

**Other studies:**

1985-1989 Violoncello, Ferenc Liszt Academy of Music, Budapest, Hungary  
1991-1995 Mathematics, Eotvos Lorand University, Budapest, Hungary

**B. Positions and Honors**

**Positions and Employment**

2005-2010 Junior Group Leader, Friedrich Miescher Institute, Basel, Switzerland  
2010-2019 Senior Group Leader, Friedrich Miescher Institute, Basel, Switzerland  
2014- Professor, Faculty of Medicine, University of Basel, Switzerland  
2018- Founding Director, Institute of Molecular and Clinical Ophthalmology Basel (IOB), Basel, Switzerland  
2019- Professor, Faculty of Science, University of Basel, Switzerland

**Scientific Advisory Board and Editorial Board Memberships**

2009- Member, Scientific Advisory Board, LASCCO SA, Geneva  
2011- Chair, Scientific Advisory Board, GenSight Biologics Inc  
2013- Member, Scientific Advisory Board, Cell type and connectivity project, Allen Brain Institute  
2014-2020 Member, Scientific Advisory Board, MRC Centre for Developmental Neurobiology, King's College London  
2015- Member, Editorial Committee, Annual Review of Neuroscience  
2015- Member, Board of Trustees, Alfred Vogt-Foundation for the Promotion of Ophthalmology  
2015- Member, Scientific Advisory Board, Leenaards Foundation  
2016 Member, Scientific Advisory Board, Champalimaud Neuroscience Program  
2016- Member, Editorial Board, Current Opinion in Neurobiology  
2016-2020 Chair, Scientific Advisory Board, Cell type and connectivity project, Allen Brain Institute  
2016- Member, Scientific Advisory Board, Inscopix Inc  
2016 Member, FENS Brain Conferences Committee

2016-	Member, Scientific Advisory Board, Max Planck Institute of Neurobiology, Martinsried, Germany
2016-	Associate Editor, Annual Review of Neuroscience
2017	Member, Review Committee, Brain Research Institute, University of Zurich
2017-2021	Member, Scientific Advisory Board, CRTD, Dresden, Germany
2017-	Co-Editor, Annual Review of Neuroscience
2018-	Member, Editorial Board, Physiological Reviews
2018-	Member, Scientific Advisory Board, Sainsbury Wellcome Centre for Neural Circuits and Behaviour, London, UK
2020-	Member, Scientific Advisory Board, Affinia Therapeutics
2020-2022	Member, Board of Directors, Arctos Medical AG
2021-	Member, Scientific Advisory Board, Sparing Vision Genomic Medicines for Ocular Diseases
2021-	Member, Scientific Advisory Board of NEUROTWIN
2023-	Member, Scientific Advisory Board, Montreal Neurological Institute

### **Honors**

1997	Fulbright Fellow
2001	Bearden Memorial Award for Biophysics, UC Berkeley
2001	Outstanding Graduate Student Instructor Award, UC Berkeley
2001	HFSP Short Term Fellow
2002	Harvard Junior Fellow
2006	Marie Curie Excellence Grant of the European Union
2009	EMBO Young Investigator
2010	ERC Starting Grant
2010	VIVA Award
2011	Alcon Award
2011	EMBO member
2013	Alfred Vogt Award in Ophthalmology
2015	ERC Advanced grant
2016	Cogan Award of ARVO
2018	Bressler Prize in Vision Science, New York
2018	W. Alden Spencer Award for Neuroscience
2019	Louis-Jeantet Prize for Medicine
2019	Order of Saint Stephen of Hungary
2019	Cloëtta Prize
2019	Semmelweis Budapest Award
2019	Louis Braille Medal
2020	ERC Advanced grant
2020	Körber European Science Prize
2020	Member of Academia Europaea
2020	Sanford and Susan Greenberg End Blindness Visionary Prize
2022	Point of View Award (ARVO / Point of View Foundation - Fundació Punt de Vista)
2022	Member of the Hungarian Academy of Sciences
2023	International Prize for Translational Neuroscience

### **C. Contribution to Science**

1. Neuronal cell types in the retina. Brain circuits are assembled from a large variety of morphologically and functionally diverse cell types. We described an atlas of cell type transcriptomes in the mouse retina. We found that each adult cell type expressed a specific set of genes, including a unique set of transcription factors, forming a 'barcode' for cell identity. The generated resource allows gene expression to be compared across adult retinal cell types, experimenting with specific transcription factors to differentiate stem or somatic cells to retinal cell types, and predicting cellular targets of newly discovered disease-associated genes. We used this resource to address how non-coding RNAs contribute to the function of adult retinal cell types and to provide mechanistic insights into cell type specific diseases.

- a. Siegert S, Scherf BG, Del Punta K, Didkovsky N, Heintz N, Roska B. (2009). Genetic address book for retinal cell types. *Nature Neuroscience*, 12(9), 1197-204.

- b. Krol J, Busskamp V, Markiewicz I, Stadler MB, Ribi S, Duebel J, Oertner TO, Schübeler D, Schrott G, Fehling HJ, Richter J, Bibel M, Roska B\* and Filipowicz W\*. (2010). Characterization of microRNAs induced by light adaptation in mouse retina reveals rapid turnover as a common property of neuronal microRNAs. (\*shared corresponding authors) *Cell*, 141(4), 618-31.
- c. Siegert S, Cabuy E, Gross Scherf B, Kohler H, Panda A, Le YZ, Fehling HJ, Gaidatzis DG, Stadler MB, Roska B. (2012) Transcriptional code and disease map for adult retinal cell types. *Nature Neuroscience*, 15(3), 487-95.
- d. Busskamp V, Krol J, Nelidova D, Daum J, Szikra T, Tsuda B, Juettner J, Farrow K, Gross Scherf B, Patino Alvarez CP, Genoud C, Sothilingam V, Tanimoto N, Stadler M, Seeliger M, Stoffel M, Filipowicz W\*, Roska B\*. (2014). MiRNAs 182 and 183 are necessary to maintain adult cone photoreceptor outer segments and visual function (\*shared corresponding authors) *Neuron*, 83(3), 586-600.
- e. Cowan CS, Renner M, De Gennaro M, Gross-Scherf B, Goldblum D, Hou Y, Munz M, Rodrigues TM, Krol J, Szikra T, Cuttat R, Waldt A, Papasaikas P, Diggelmann R, Patino-Alvarez CP, Galliker P, Spirig SE, Pavlinic D, Gerber-Hollbach N, Schuierer S, Srdanovic A, Balogh M, Panero R, Kusnyerik A, Szabo A, Stadler MB, Orgül S, Picelli S, Hasler PW, Hierlemann A, Scholl HPN, Roma G\*, Nigsch F\*, Roska B\* Cell types of the human retina and its organoids at single-cell resolution(\*shared corresponding authors). *Cell*. 2020, 182,6:1623-1640

2. Neuronal circuit function in the retina. How different neuronal cell types dynamically interact with each other in neuronal circuits to achieve a particular function is a central question in neuroscience. We combined genetic labelling of cell types, two-photon imaging, electrophysiology, and theoretical modelling to address this question in the retina. We described novel retinal computations, provided mechanistic insights into the computations and showed that a number of retinal circuits are multifunctional, they change their computation depending on the state of the circuit.

- a. Münch TA, da Silveira RA, Siegert S, Viney TJ, Awatramani GB, Roska B. (2009). Approach sensitivity in the retina processed by a multifunctional neural circuit. *Nature Neuroscience*, 12(10), 1308-16.
- b. Farrow K, Teixeira M, Szikra T, Juettner J, Viney JT, Balint K, Yonehara K, Roska B. (2013). Ambient illumination toggles a neuronal circuit switch in the retina and visual perception at cone threshold. *Neuron*, 78, 1–14.
- c. Yonehara K, Farrow K, Ghanem A, Hillier D, Balint K, Teixeira M, Jüttner J, Noda M, Neve R, Conzelmann KK, Roska B. (2013). The first stage of cardinal direction selectivity is localized to the dendrites of retinal ganglion cells. *Neuron*, 79(6), 1078-85.
- d. Szikra T, Trenholm S, Drinnenberg A, Juettner J, Raics Z, Farrow K, Biel M, Awatramani G, Clark D, Sahel JA, da Silveira RA, Roska B. (2014). During daylight rods act as relay cells conveying cone-driven horizontal cell-mediated surround inhibition to downstream visual circuits. *Nature Neuroscience*, 17(12), 1728-35.
- e. Drinnenberg A, Franke F, Morikawa RK, Jüttner J, Hillier D, Hantz P, Hierlemann A, da Silveira RA\*, Roska B\* How diverse retinal functions arise from feedback at the first visual synapse. (\*shared corresponding authors) *Neuron* 2018, 99(1):117-134

3. Neuronal circuit development and neurodevelopmental diseases of the retina. Spatial asymmetries in neural connectivity have an important role in creating basic building blocks of neuronal processing. It was not known how and when circuit asymmetries are established during development, furthermore the molecular mechanism responsible for setting up circuit asymmetries was unknown. Our work demonstrated a rapid developmental switch from a symmetric to asymmetric input distribution for inhibition in the neural circuit of a principal cell and defined the first molecule of a pathway that is responsible for the development of cardinal circuit asymmetry in the retina. This work also showed the involvement of a specific inhibitory neuron type in the pathophysiology of a neurodevelopmental disease.

- a. Yonehara K, Balint K, Noda M, Nagel G, Bamberg E, Roska B. (2011). Spatially asymmetric reorganization of inhibition establishes a motion-sensitive circuit. *Nature*, 469(7330), 407-10.

- b. Yonehara K, Fiscella M, Drinnenberg A, Esposti F, Trenholm S, Krol J, Franke F, Scherf BG, Kusnyerik A, Müller J, Szabo A, Jüttner J, Cordoba F, Reddy AP, Németh J, Nagy ZZ, Munier F, Hierlemann A, Roska B. (2016). Congenital Nystagmus Gene FRMD7 Is Necessary for Establishing a Neuronal Circuit Asymmetry for Direction Selectivity. *Neuron*, 89(1):177-93.
- c. Munz M, Bharioke A, Kosche G, Moreno-Juan V, Brignall A, Rodrigues TM, Graff-Meyer A, Ulmer T, Haeuselmann S, Pavlinic D, Ledergerber N, Gross-Scherf B, Rózsa B, Krol J, Picelli S, Cowan CS, Roska B. Pyramidal neurons form active, transient, multilayered circuits perturbed by autism-associated mutations at the inception of neocortex. *Cell*. 2023 Apr 27;186(9):1930-1949.e31.

4. Degenerative retinal diseases and cell-type-targeted optogenetic therapy. Retinitis pigmentosa refers to a diverse group of hereditary diseases affecting two million people worldwide that lead to incurable blindness. As a common pathology, rod photoreceptors die early whereas light-insensitive, morphologically altered cone photoreceptors persist longer. We showed two different retinal cell-type-targeted approaches to restore retinal and cortical visual activity as well as visual behavior in blind mouse models of retinitis pigmentosa. In collaboration with Jose Sahel and his research group, using human ex vivo retinas, we also showed that one of our approaches could reactivate light-insensitive human photoreceptors and identified blind patients for potential therapy. With Jose Sahel and our other collaborators we funded a company, GenSight Biologics (<http://www.gensight-biologics.com>), with the mission to bring cell-type targeted therapies for blindness into the clinic.

- a. Lagali PS, Balya D, Awatramani GB, Münch TA, Kim DS, Busskamp V, Cepko CL, Roska B. (2008). Light-activated channels targeted to ON bipolar cells restore visual function in retinal degeneration. *Nature Neuroscience*, 11(6):667-75.
- b. Busskamp V, Duebel J, Balya D, Fradot M, Viney TJ, Siegert S, Groner AC, Cabuy E, Forster V, Seeliger M, Biel M, Humphries P, Paques M, Mohand-Said S, Trono D, Deisseroth K, Sahel JA, Picaud S, Roska B. (2010). Genetic reactivation of cone photoreceptors restores visual responses in retinitis pigmentosa. *Science*, 329(5990):413-7.
- c. Jüttner J, Szabo A, Gross-Scherf B, Morikawa R, Rompani S, Hantz P, Szikra T, Esposti E, Cowan C, Bharioke A, Patino-Alvarez C, Keles Ö, Kusnyerik A, Azoulay T, Hartl D, Krebs A, Schübeler D, Hajdu R, Lukats A, Nemeth J, Nagy Z, Wu KC, Wu RH, Xiang L, Fang XL, Jin ZB, Goldblum D, Hasler P, Scholl H, Krol J\*, Roska B\* (2019) Targeting neuronal and glial cell types with synthetic promoter AAVs in mice, non-human primates, and humans (\*shared corresponding authors) *Nature Neuroscience*. Aug;22(8):1345-1356.
- d. Nelidova D, Morikawa RK, Cowan CS, Raics Z, Goldblum D, Scholl H, Szikra T, Szabo A, Hillier D\*, Roska B\* (2020) Restoring light sensitivity using tunable near-infrared sensors (\*shared corresponding authors) *Science*, accepted for publication
- e. Sahel JA, Boulanger-Scemama E, Pagot C, Arleo A, Galluppi F, Martel JN, Degli Esposti S, Delaux A, de Saint Aubert JB, de Montleau C, Gutman E, Audo I, Duebel J, Picaud S, Dalkara D, Blouin L, Taniel M, Roska B. Partial recovery of visual function in a blind patient after optogenetic therapy. *Nature Medicine*. 2021 Jul;27(7):1223-1229

5. Neuronal circuit function in the thalamus and visual cortex. Individual cortical neurons can selectively respond to specific environmental features, such as visual motion or faces. How this relates to the selectivity of the presynaptic network across cortical layers was unclear. We used single-cell-initiated, monosynaptically restricted retrograde transsynaptic tracing with rabies viruses expressing GCaMP6s to image, in vivo, the visual motion-evoked activity of individual layer 2/3 pyramidal neurons and their presynaptic networks across layers in mouse primary visual cortex. Our work demonstrated the existence of feature-locked and feature-variant cortical networks. The approach described in this work can be used to study how particular feature selectivities arise in the cortex and other parts of the brain. We recently extended this approach to study how individual thalamic neurons integrate information from different retinal ganglion cell types.

- a. Wertz A, Trenholm S, Yonehara K, Hillier D, Raics D, Leinweber M, Szalay G, Ghanem A, Keller G, Rózsa B, Conzelmann KK, Roska B. (2015). Single-cell-initiated Monosynaptic Tracing Reveals Layer-specific Cortical Network Modules. *Science*, 349 (6243):70-4
- b. Rompani SB, Müllner FE, Wanner A, Zhang C, Roth CN, Yonehara K, Roska B. (2017). Different Modes of Visual Integration in the Lateral Geniculate Nucleus Revealed by Single-Cell-Initiated Transsynaptic Tracing. *Neuron*. Feb 22;93(4):767-776

- c. Hillier D, Fiscella M, Drinnenberg A, Trenholm S, Rompani SB, Raics Z, Katona G, Juettner J, Hierlemann A, Rozsa B, Roska B (2017). Causal evidence for retina-dependent and -independent visual motion computations in mouse cortex. *Nature Neuroscience* Jul;20(7):960-968
- d. Schubert R, Trenholm S, Balint K, Kosche G, Cowan CS, Mohr MA, Munz M, Martinez-Martin D, Fläschner G, Newton R, Krol J, Gross Scherf B, Yonehara K, Wertz A, Ponti A, Ghanem A, Hillier D, Conzelmann KK, Müller DJ\*, Roska B\* (2018). Virus stamping for targeted single cell infection in vitro and in vivo (\*shared corresponding authors) *Nature Biotechnology* 36(1):81-88
- e. Macé E, Montaldo G, Trenholm S, Cowan C, Brignall A, Urban, Roska B (2018) Whole-brain functional ultrasound imaging reveals brain modules for visuomotor integration. *Neuron* 100(5):1241-1251

#### D. Patents

	<b>Inventors</b>	<b>Title</b>	<b>Applicants</b>	<b>Publication or filing date</b>	<b>International Publication number</b>
01	LAGALI MUENCH ROSKA	Use of light sensitive genes	Novartis Forschungs stiftung	28.02.2008	JP273556848, US151436471, US76409737, US97237714, WO2008022772, JP274022893, EP10995363, US43018675, CA94380857, AU194383193
02	BALINT BOLDOGKŐI ROSKA	Novel tool for the analysis of neural circuits	Balint, Boldogkői, Roska	17.09.2009	US73191131, WO2009112448, EP11216470
03	BUSSKAMP DUEBEL PICAUD ROSKA SAHEL	Functionalized organotypic systems	FMI / INSERM	07.04.2011	US74047882, WO2011039161, EP58176612
04	JUETTNER ROSKA SIEGERT	Rod cell-specific promoter	FMI	16.05.2013	WO2013068413, US123274075
05	SAHEL PICAUD LEVEILLARD DALKARA DUEBEL ROSKA	Methods and compositions for treatment of retinal degenerative diseases	FMI	29.08.2013	US130503627, US175459311, WO2013124477
06	JUETTNER ROSKA	Retinal OFF circuit-specific promoter	FMI	06.03.2014	US153434727, WO2014033095, EP137964078
07	BALINT MUELLER ROSKA SCHUBERT	Novel methods for the targeted introduction of viruses into cells	FMI ETHZ	14.08.2014	WO2014122605, EP153683981, US153999901
08	ROSKA LAGALI	Retinal ON bipolar cells-specific artificial promoter	FMI	18.12.2014	WO2014199299, US173532599, EP161890009
09	BUSSKAMP FILIPOWICZ KROL ROSKA	Tools and methods using miRNA 182, 96 and/or 183 for treating pathologies	FMI	02.04.2015	US178413082, WO2015044890, US224021253, EP175559062
10	ROSKA JUETTNER	All Retinal amacrine cell-specific promoter	FMI	13.08.2015	US195462536, WO2015118507, EP189843932
11	JUETTNER ROSKA	Müller cell-specific promoter	FMI	20.08.2015	US191716711, WO2015121793, EP189844419

12	BALYA BUSSKAMP LAGALI ROSKA	Therapeutical tools and methods for treating blindness	FMI	01.09.2016	US177221640
13	JUETTNER NELIDOVA ROSKA	Novel therapeutical tools and methods for treating blindness by targeting photoreceptors	FMI	23.03.2017	CN225013464, EP224029940, WO2017046084
14	JUETTNER ROSKA	Promoter for the specific expression of genes in retinal endothelial cells	FMI	20.04.2017	US231859054, EP225117933, WO2017064642
15	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP157, a promoter for the specific expression of genes in rod photoreceptors	FMI	07.06.2017	EP198312764
16	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP159, a promoter for the specific expression of genes in rod photoreceptors	FMI	08.06.2017	CN225558692, EP231572709, US234730076, WO2017093931
17	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP160, a promoter for the specific expression of genes in rod photoreceptors	FMI	08.06.2017	US234728317, EP231573373, WO2017093934, CN225669088
18	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP161, a promoter for the specific expression of genes in rod photoreceptors	FMI	08.06.2017	EP231572710, CN225669012, US237648943, WO2017093935, BR236243252, ES295285960
19	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP162, a promoter for the specific expression of genes in rod photoreceptors	FMI	08.06.2017	EP231572711, US234460769, WO2017093936, CN225669106
20	DALKARA PICAUD DESROSIERS SAHEL DUEBEL BEMELMANS ROSKA	Promoters and uses thereof	INSERM	08.06.2017	EP231573376, US234730053, CN241712203, AU215301075, WO2017093566
21	ROMPANI ROSKA	Novel therapeutic tools and methods for treating blindness	FMI	23.11.2017	EP239835965, US248166522, WO2017199156
22	HARTL JUETTNER KREBS ROSKA SCHUEBELER	SynP198, a promoter for the specific expression of genes in direction selective retinal ganglion cells	FMI	11.05.2018	EP3534966, US251445667, EP251454112, CN250175483, WO2018083607, BR247682029
23	JUETTNER ROSKA TEIXEIRA	SynPI, a promoter for the specific expression of genes in interneurons	FMI	07.06.2018	US278926577, CN250175545, EP254133625, WO2018099975
24	JUETTNER ROSKA TEIXEIRA	SynP107, a promoter for the specific expression of genes in interneurons	FMI	07.06.2018	CN250175546, EP254133624, US278926576, WO2018099974
25	ROSKA JUETTNER	SynP88, a promoter for the specific expression of genes in retinal ganglion cells	FMI	16.08.2018	EP279630571, CN276140804, US305253002, WO2018146588

26	JUETTNER NELIDOVA ROSKA	Therapeutical tools and methods for treating blindness by targeting photoreceptors	FMI	13.09.2018	US225645623
27	FLAESCHNER MUELLER ROSKA SCHUBERT TRENHOLM	Novel methods for targeted introduction of viruses into cells and tissues	FMI	21.02.2019	EP297165692, US295679949, WO2019035001
28	JUETTNER KROL ROSKA	Primate retinal pigment epithelium cell-specific promoter	FMI	23.05.2019	SG306154626, CN308308600, CR309796351, IN306149348, MY308478694, EP306633437, WO2019097454
29	JUETTNER KROL ROSKA	SynP61, a primate retinal pigment epithelium cell-specific promoter	FMI	06.06.2019	SG306156658, CR311599018, CN302979447, IN306149331, WO2019106027, EP307383706, MY308475682, BR313323854
30	JUETTNER KROL ROSKA	SynPIII, a promoter for the specific expression of genes in retinal pigment epithelium	FMI	06.06.2019	SG306156671, EP307383865, CR311599019, MY308475693, US314530953, IN306149815, WO2019106035, AU296580874, CN304759999, BR313323866
31	NELIDOVA ROSKA	Novel therapeutical tools and methods using temperature-sensitive receptors for treating blindness	FMI, IOB	19.02.2020	EP20200158285
32	JUETTNER KROL ROSKA	SynP27 (ProB12), a promoter for the specific expression of genes in protoplasmic astrocytes	FMI	30.04.2020	WO2020084538
33	JUETTNER KROL ROSKA	SynP151 (ProC29), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.04.2020	WO2020084541
34	JUETTNER KROL ROSKA	SynP17 (ProB1), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.04.2020	WO2020084537
35	JUETTNER KROL ROSKA	SynP194 (ProB15), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.04.2020	WO2020084542
36	JUETTNER KROL ROSKA	SynP57 (ProA14), a promoter for the specific expression of genes in photoreceptors	FMI	30.04.2020	WO2020084539
37	JUETTNER KROL ROSKA	SynP78 (ProA27), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.04.2020	WO2020084540
38	JUETTNER KROL ROSKA	SynP166 (ProA36), a promoter for the specific expression of genes in photoreceptors	FMI	30.07.2020	WO2020152626
39	JUETTNER KROL ROSKA	SynP35 (ProC8), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.07.2020	WO2020152624
40	JUETTNER KROL ROSKA	SynP5 (ProA9), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.07.2020	WO2020152623

41	JUETTNER KROL ROSKA	SynP66 (ProA21), a promoter for the specific expression of genes in retinal ganglion cells	FMI	30.07.2020	WO2020152625
42	BELL KROL JUETTNER MCGEE ROSKA	Compositions and methods to treat Bietti crystalline dystrophy	FMI	03.09.2020	WO2020174369, WO2020174368

## E. Postdocs and students

Trained/currently training 42 postdoctoral students. Trained/currently training 15 graduate students. 14 former lab members are professors or independent group leaders. 4 previous lab members received ERC Starting Grant.

## F. Selected Invited Talks

**2005:** Harvard Medical School; Massachusetts Eye and Ear Infirmary, Boston; MIT, Cambridge; Basel Neuroscience keynote talk; Institut de Génétique et de Biologie Moléculaire et Cellulaire, Illkirch; **2006:** FASEB summer conference; Max Planck Institute Martinsried; University of Oldenburg; Max Planck Institute Frankfurt; **2007:** College de France, Paris; Netherlands Institute for Neuroscience, Amsterdam; Harvard Medical School, Boston; University of Pennsylvania; **2008:** Max-Planck-Institute Frankfurt; Humboldt-University, Berlin; University of Santiago de Compostela; German Ophthalmological Society Meeting, Berlin; MRC Laboratory for Molecular Cell Biology, London; **2009:** Klosters; Hertie Winter School, Obergurgel, Austria; ETH Zurich; Max-Planck-Institute, Heidelberg; Cold Spring Harbor Laboratories; NCCR Neuroscience Symposium keynote talk; Fondation des Treilles, Tourtour; FASEB Summer Conference, Geneva; Champalimaud Neuroscience Program, Lisbon; European Retina Meeting keynote talk, Oldenburg, Germany; Princeton University; Wellcome Trust Brain Complexity Meeting, Cambridge; University Leuven; ESF Research Conference on Rare Disease, Saint Feliu de Guixols, Spain; **2010:** Institute of Molecular Pathology, Vienna; 40th Anniversary of the Friedrich Miescher Institute for Biomedical Research, Basel; NIBR GTX SAB meeting, Cambridge, USA; ARVO Meeting, Fort Lauderdale; EMBO Young Investigator Meeting, Heidelberg; ERC-2010, Brussels; Neuroprosthetics Symposium, Heidelberg; University of Göttingen, keynote speaker; Office of Naval Research ONR, Vision & Audition Meeting, Washington, DC; 6th Korean-Novartis Biomedical Symposium, Seoul; RETICIRC, Lucerne; European Commission, Brussels; Retina International World Congress, Stresa, Italy; FASEB Summer Research Conferences, Vermont Academy, Saxtons River, Vermont; Gordon Conference, Bates College, Lewinston, Maine; UKT University of Tübingen, Institute for Ophthalmic Research, Tübingen; EMBO Heidelberg; NCCR Meeting, Saas-Fee; KAVLI Institute, Santa Barbara; UC Berkeley, CA; SfN Society for Neuroscience, San Diego; EMDW Meeting, La Ciotat; University of Fribourg; **2011:** Swiss Eye Research Meeting SERM2011, Biel; MRC Center for Developmental Neurobiology, King's College London, London; See Better, Brussels; MRC Laboratory of Molecular Biology, Cambridge; Telethon Institute of Genetics and Medicine TIGEM, Naples; Optogenetics Symposium NWG2011, Göttingen (9th Göttingen Meeting of the German Neuroscience Society); Boehringer Ingelheim Fonds, International Titisee Conference; UCL, Institute of Ophthalmology, London; University of Oxford, UK; Pro Retina Foundation, Potsdam; ARVO Meeting, Fort Lauderdale; University of Munich; Ciliopathies Workshop, NIBR Cambridge, USA; ASGCT Annual Meeting; Allen Institute for Brain Science, Seattle; IST Austria (Institute of Science and Technology), Klosterneuburg; Ludwig-Maximilians-University, Munich-Martinsried; Paris Interdisciplinary PhD Symposium, Paris; FENS IBRO SfN School, Bertinoro, Italy; NIBR Cambridge, USA; University of Tübingen; MPI for Brain Research, Frankfurt; NIBR Cape Cod Retreat; European Retina Meeting, Amsterdam; University of Oxford, UK; University of Lausanne; Technical University Dresden, DFG – Center for Regenerative Therapies, Dresden; NIH National Eye Institute, Bethesda; Society for Neuroscience (SfN Short Course), Neuroscience 2011, Washington DC; Max-Planck-Institute Tübingen; Optogenetics Meeting Lausanne; Hôpital Ophtalmique Jules-Gonin, SGOF Lausanne; NIBR Cambridge, USA; Hellenic Society on Biochemistry and Molecular Biology, Athens; **2012:** University of Pennsylvania, Philadelphia; ICM - Institut du cerveau et de la moelle épinière Hôpital Pitié-Salpêtrière, Paris; GWDG Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen; NERF Symposium, IMEC Brussels; Department of Ophthalmology & Visual Sciences, University of Louisville; Salk Institute for Biological Studies, La Jolla; HHMI Howard Hughes Medical Institute, Janelia Farm Campus, Ashburn; DZNE German Center for Neurodegenerative Diseases within the Helmholtz Association, Bonn; Transylvanian Experimental Neuroscience Summer School, Cluj; NIBR Scientific Retreat Brewster; Institute for Clinical



Neurobiology, Würzburg; International Max Planck Research School for Molecular and Cellular Life Sciences, Martinsried; FASEB, Steamboat Springs; Colby-Sawyer College, New London; Free University Berlin; INM Institute for Neuroscience of Montpellier, Montpellier; Ophthalmic Education and Faculty Development Harvard Medical School, Boston; Institut de la Vision, Paris; ONR Naval Science & Technology Partnership Conference, Arlington; EMBO Heidelberg; Novartis lecture, Basel; NIBR Cambridge, USA; **2013:** NIBR Cambridge, USA; Caltech California Institute of Technology, Pasadena; Yale University, New Haven; NYU New York University, Neuroscience Institute, New York; Columbia University, New York; Harvard University, Boston; Int'l Neuroscience Winter Conference, Sölden; Hanse-Wissenschaftskolleg, Delmenhorst; Max Planck Institute of Neurobiology, Martinsried; Cell Symposia: Genes, Circuits and Behavior, Toronto; Neuroscience workshop, Bertinoro; Bionext, Egham, Surrey; Transylvanian Experimental Neuroscience Summer School TENS, Pike Lake; Cold Spring Harbor Laboratory, Cold Spring Harbor; Allen Institute for Brain Science, Seattle; Swiss Society of Ophthalmology, Locarno; European Visual Cortex Meeting, Zagreb; European Retina Meeting, Alicante; Sino-Swiss Stepping Stone Symposium, Shanghai; Novartis Institutes for Biomedical Research NIBR, Shanghai; Cold Spring Harbor Asia Conference, Suzhou; The Eye Hospital of Wenzhou Medical College, Wenzhou; Karolinska Institute, Stockholm; Case Western Reserve University, Cleveland; The Royal Swedish Academy of Sciences, Stockholm; Max Planck Institute of Neurobiology, Martinsried; **2014:** Cambridge University, Cambridge, UK; Newcastle University; Basel Bench to Bedside Conference; Janelia Farm, Lasker Initiative Meeting; 4th International Caesar Conference, Bonn; FENS Conference, Copenhagen; King's College, London; Technische Universität, Dresden; Cornell University New York; Kavli Conference, Spitsbergen; FENS Form of Neuroscience, Milan; Novartis Institutes for Biomedical Research NIBR Scientific Retreat, Cape Cod; NERF/VIB PhD Symposium, University of Leuven; University of Alicante, Alicante; Semmelweis Medical School, Budapest; European Society for Gene and Cell Therapy ESGCT meeting, The Hague; Vision Institute of Paris retreat, Keynote talk; University of Helsinki, Helsinki; Max Planck Institute for Neurobiology, Munich; Neuroscience 2014 Annual Meeting, Washington; Winter School in Quantitative Systems Biology, Trieste; **2015:** 50th Winter Seminar, Klosters; IMP-IMBA-BI Meeting, Gumpoldskirchen; LS2-Annual Meeting, Zurich; Pasteur Institute, Paris; Fondation des Treilles, Tourtour; Sunposium, Palm Beach Gardens; Retina Suisse; Janelia Conference, Janelia Farm; ARVO Meeting, Denver; NCCR, Basel; McKnight Annual Conference, Aspen; Kavli Institute meeting, Copenhagen; CSHA Meeting on Francis Crick Symposium, Suzhou; ION Minisymposium, Shanghai; CSH Vision Course, New York; ISOPT Meeting, Berlin; European Visual Cortex Meeting, Kloster Seeon; Champalimaud Centre for the Unknown, Lisbon; European Retina Meeting ERM, Brighton; Michigan University, Ann Arbor; SfN Meeting, Chicago; Macula Vision Research Foundation MVRF Conference, Boston; Heinrich Wieland Prize Symposium, Munich; Zentrum für Lehre und Forschung, Basel; Max Planck Institute for Brain Research, Frankfurt; **2016:** Biocenter, Basel; Collège de France, Paris; Ecole Normale Supérieure, Paris; Institut de la Vision, Paris; Cold Spring Harbor Laboratory course, New York; ARVO Meeting, Seattle; Neurological Institute and Hospital, Montreal; Paul Scherrer Institute, Villigen; Keystone Symposium, Alpbach; Collège de France, Paris; Weizmann Institute of Science, Rehovot; Hungarian Ophthalmological Society, Pecs; Symposium Kavli Prize, Trondheim; Biophysical Society, Ascona; Zurich Neuroscience Center Zurich, Zurich; Inscopix Decode Summit, Palo Alto; Ecole Polytechnique Fédérale de Lausanne (EPFL), Brain Mind Institute, Lausanne; Dowling-Werblin Symposium, Sonoma; European Brain Research Institute (EBRI) Rome; European Molecular Biology Laboratory (EMBL), Rome; Lighthouse Guild Vision+Health, New York; Brain Research Institute HiFo, Zurich; Max Delbrueck Centrum, Berlin; **2017:** Pallas Clinics Zurich; Research Institute of Molecular Pathology IMP, Gumpoldskirchen; Duke University School of Medicine, Durham; Radboud University, Nijmegen; Aarhus University, Aarhus; EMBL Heidelberg; Nordic Neuroscience, Stockholm; Rumania Summer Neuro Camp Cluj-Napoca; Interacting with Neural Circuits CAJAL, Lisbon; Fox Center Conference on Optic Nerve Regeneration, Washington; Korean Society for Brain and Neural Science KSBNS, Seoul; Korea Advanced Institute of Science and Technology KAIST, Seoul; European Visual Cortex Meeting EUNOS, Budapest; EU Visual Cortex Meeting, London; EMBO Basel; King's College, London; European Retina Meeting, Paris; Ri.MED Foundation, Rome; Chan-Zuckerberg Initiative and New York Stem Cell Foundation, New York; Columbia University, New York; IGBMC, Strasbourg; Basler Fortbildungstage, Basel; **2018:** Keystone Symposium, Keystone, Colorado; UCLA, Los Angeles; Max Planck Institute, Martinsried; Institute for Ophthalmic Research, Tübingen; Center for Neurosensory Systems, Tübingen; Hôpital ophtalmique Jules-Gonin, Lausanne; Harvard Medical School, Boston; Caltech, Pasadena; University of Pittsburgh, Pittsburgh; Advanced training in Neurology, Neurosurgery, Neuroradiology, Neuropathology, University Hospital Basel, Basel; EU-LIFE scientific meeting, Paris; Transylvanian Experimental Neuroscience Summer School TENS, Pike Lake; FASEB Science Research Conference, Olean; FENS Forum of Neuroscience, Berlin; Max-Planck-Institut für Biophysik, Frankfurt am Main; Neuroscience School of Advanced Studies, Venice; The Alfred W. Bressler Vision Science

Symposium, New York; W. Alden Spencer Lecture, Columbia University, New York; World Sight Day, Novartis, Basel; ESGCT/ISSCR/SFTCG, Lausanne; Keystone Symposia, Vienna; GGNB, Georg-Augustus-Universität, Göttingen; Glaucoma Meeting Basel, Basel; ART Vienna, Vienna; The William R. Miller Lecture, Cold Spring Harbor Laboratory, Cold Spring Harbor; **2019**: Arthur M. Sackler Colloquium, Irvine; Vienna Biocenter, Vienna; ISSCR, Amsterdam; Vision Talks, Roche, Basel; Fondation Louis-Jeantet, Geneva; Transylvanian Experimental Neuroscience Summer School TENS, Pike Lake; Retina Suisse, Basel; OptoDBS, Geneva; Discovery Seminar Series, Biocenter Basel, Basel; GenSight Biologics, Paris; Institute of Ophthalmology, UCL, London; FENS/IBRO Cajal Advanced Training Programme, Lisbon; 18th National Congress of the Spanish Society of Neuroscience (SENC), EMBO Keynote lecture, Santiago de Compostela; Louis-Jeantet Prize lecture, EMBO at Basel Life, Basel; Keynote lecture, The European Retina Meeting (ERM), Helsinki; International Inauguration Meeting, Hearing Institute, Paris; PharmaExecutiveMeeting (PEM), Basel; Cloëtta Prize lecture, Basel; Novartis lecture, Basel; Semmelweis Budapest Award lecture, Budapest; Public lecture for the Hungarian Federation of the Blind and Partially Sighted (MVGYSZ), Budapest; NIBR Science Day, Basel; Institut de la Vision, Paris; **2020**: Neuro-Electronics Research Flanders (NERF), Leuven; Simons Foundation, New York; Cole Eye Institute, Cleveland Clinic, Cleveland; ISSCR 2020 (virtual); Virtual EMBO | EMBL Symposium; Harvard Medical School, Virtual Neurobiology Seminar; Virtual Ophthalmology Research Seminars series, University of California, Irvine (UCI); **2021**: Online From Bench to Bedside Symposium, Biocenter, Basel; Neuroscience Data Talk, IST, Klosterneuburg (virtual); Public online lecture, Semmelweis University, Budapest; Stem Cells, Genome Engineering and Regenerative Medicine online Course, Columbia University, Department of Ophthalmology, New York; Wissenschaftsmonat, virtual keynote lecture, University of Basel, Basel; Hungarian National Scientific Student Circle Conference, virtual opening lecture, Szeged; Hybrid Makula Update, online lecture, Hamburg; Biomedical Vision Seminar, virtual, Universitäts-Augenklinik Bonn, Bonn; Tudományos Diákköri Konferencia 2021, virtual, Marosvásárhely; Telethon Institute of Genetics and Medicine (TIGEM), online seminar, Pozzuoli; Life Science Seminar series, virtual, University of Debrecen, Debrecen; Alector online seminar, South San Francisco; The Gilbert Family Foundation (GFF) NF1 Seminar Series, virtual, Detroit; Bar-Ilan University (BIU) Vision Seminar, virtual, Ramat Gan; 14th International CRTD Conference on Regenerative Medicine, Center for Regenerative Therapies TU Dresden (CRTD), virtual, Dresden; IRD 2021 Scientific Standalone - Insights into Clinic, Science, Genetics - virtual, Frankfurt am Main; CEPOF - First congress of rare disease, virtual, Buenos Aires; From Brain to Bedside, Translation of next-generation circuit therapies workshop, The National Institutes of Health (NIH), virtual, Bethesda; Science Day Neuroanatomy, online seminar, LMU Munich, Martinsried; Magyar Orvos-egészségügyi Világtalálkozó (World Congress of Hungarian Doctors and Health Workers), virtual, Budapest; Keynote lecture, International Society for Genetic Eye Diseases and Retinoblastoma (ISGEDR), Lausanne; 49th Meeting of the European Brain and Behaviour Society, virtual, Lausanne; Keynote lecture, Annual Meeting of the Basel Stem Cell Network, virtual, Basel; EURETINA 2021 Virtual, Research session; Fondation des Treilles, Tourtour; Novartis NIBR Seminar and Roundtable, virtual, Basel; DOG 2021, Symposium of the AG Young DOG, virtual; Louis-Jeantet Symposium, virtual; European University for Well-Being EUniWell, FestiWell 2021, keynote lecture, virtual, Budapest; PharmaExecutiveMeeting (PEM), Basel; Interdisciplinary Doctoral Conference (IDK) 2021, virtual, Pécs; NATURE 2021 Conference, virtual; European Reference Network dedicated to Rare Eye Diseases (ERN-EYE) 2021, 4th scientific workshop: Models for rare eye diseases, virtual, Dublin; Basler Fortbildungstage, Retina 2021, Basel; **2022**: Advanced training in Neurology, Neurosurgery, Neuroradiology, Neuropathology, virtual, University Hospital Basel, Basel; Vanderbilt Eye Institute Distinguished Lecture Serie, virtual, Vanderbilt University Medical Center, Mt. Juliet; Stem Cells, Genome Engineering and Regenerative Medicine Course (BMENE6510), virtual, Columbia University, New York; 10th Research Day in Medicine - Bridging Bench and Practice: Biomedical Research at the University of Fribourg, keynote lecture, Fribourg; BIO-Europe Spring panel: Roles, challenges and opportunities for each member of the ecosystem, virtual, Novartis, Basel; University of California San Francisco (UCSF), Neuroscience lecture, San Francisco; University of California San Francisco (UCSF), Department of Ophthalmology Grand Rounds, Roy Steinberg Memorial Lecture, San Francisco; Swiss Biotech Day 2022, Basel; 6th Conference of the Association of Hungarian American Academicians, virtual keynote lecture, Budapest; Institute of Brain Science, Fudan University, virtual, Shanghai, China; Intersectional Max Planck Symposium "The Future of Neuroscience: Math, Music, Maps and More", Berlin; Interacting with Neural Circuits, Cajal Advanced Neuroscience Training Programme, Champalimaud Centre for the Unknown, Lisbon; 27th European Society for Animal Cell Technology (ESACT) Meeting, Keynote lecture, Lisbon; New Horizons In Ophthalmology - From Molecular Mechanisms to Therapy, Molecular Therapy Development III, virtual evening lecture, University of Tübingen, Tübingen;

Novartis, Annual Meeting of the Retired Management, Basel; Day of BioMedical Research, Department for BioMedical Research (DBMR), University of Bern, keynote lecture, Bern; Symposium "From Neural Circuits to Behaviour" in honor of T. Bonhoeffer, Max Planck Institutes Martinsried, Martinsried; Vision Restoration Summer School 2022, virtual, Saint-Paulin (QC, Canada); 50th Cambridge Ophthalmological Symposium, Old Divinity School, St John's College, Cambridge (UK); EMBO | Japan Virtual Lectures: Molecular and clinical approaches to restoring visual function, virtual, Osaka, Sapporo, Tokyo; Ethics of Engineering Life, 1st International Conference, Rome; The assembly and function of neuronal circuits conference, Ascona; 47th Meeting of European Paediatric Ophthalmological Society, virtual, Munich; XXVIII. Hungarian Health Days, Balatonalmádi, virtual lecture; PharmaExecutiveMeeting (PEM), Basel; XIX. meeting of Nobel laureates and talented students, Szeged; Seminar lecture, Semmelweis University, Centre for translational medicine, Budapest; Scientific lecture, Hungarian Academy of Science (MTA), Budapest; Sainsbury Wellcome Center Hybrid Seminar lecture, London; Beijing Institute of Ophthalmology (BIO), virtual, Beijing; **2023:** 56th Winter Seminar, Klosters; Stem Cells, Genome Engineering and Regenerative Medicine Course (BMENE6510), virtual, Columbia University, New York; Keystone Symposia "Stem Cells: Advances in the Application of Stem Cells and their Role in vivo", keynote lecture, Keystone, Colorado; Istituto delle Scienze Neurologiche di Bologna (ISNB-IRCCS), Bologna; "Neurotechnology 2023: Precision Approaches for Studying and Treating the Brain", David Lopatie Conference Centre, Weizmann Institute of Science, Tel Aviv; "Solution to a retinal mystery by patients of Francis Munier", farewell symposium in honor of Francis Munier, Lausanne; International Prize for Translational Neuroscience, Prize lecture, Hamburg; Swiss MD-PhD Association (SMPA), keynote lecture, Murten; Symposium on Ion Channels and Gene Therapy (in honor of Martin Biel), Munich;

## **G. Journal and Grant Reviews**

Articles reviewed: Cell, Nature, Science, Neuron, Nature Neuroscience, Nature Methods, Nature Biotechnology, Annual Reviews in Neuroscience, Current Biology, Nature Communications

Co-Editor: Annual Review of Neuroscience

Editorial Board Member: Physiological Reviews, Current Opinion in Neurobiology

Proposals reviewed: Swiss, EU and International grants

## **H. Organized conferences**

- 2013 The assembly and function of neuronal circuits conference, Ascona, Switzerland, Member of organizing committee
- 2014 FENS Forum of Neuroscience, Milan, Italy, Member of the Program Committee,
- 2014 FENS/The Brain Conferences: Controlling Neurons, Circuits and Behaviour, Rungstedgaard, Denmark, Member of organizing committee
- 2015 The assembly and function of neuronal circuits conference, Ascona, Switzerland, Member of organizing committee
- 2015 Francis Crick Symposium: Advances in Neuroscience, Suzhou, China, Co-chair
- 2016 Dowling-Werblin Symposium "Half a Century of Retina Research: Neural Circuitry, Retinal Disorders, and Restoration of Vision", Sonoma CA, USA, Co-organizer, member of the program committee
- 2017 The assembly and function of neuronal circuits conference, Ascona, Switzerland, Member of organizing committee
- 2019 The assembly and function of neuronal circuits conference, Ascona, Switzerland, Member of organizing committee
- 2022 The assembly and function of neuronal circuits conference, Ascona, Switzerland, Member of organizing committee

## **I. Industrial innovation**

2013 Co-founder of GenSight Biologics (<http://www.gensight-biologics.com>), a clinical-stage biotechnology company discovering and developing novel optogenetic therapies for neurodegenerative diseases of the eye and central nervous system.

2019 Co-founder of Affinia Therapeutics, a biotechnology company discovering and developing novel gene therapies for neurodegenerative diseases.