

Botond ROSKA

Selected publications

Peer reviewed articles

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. Congenital Nystagmus Gene FRMD7 Is Necessary for Establishing a Neuronal Circuit Asymmetry for Direction Selectivity. **Neuron**. 2016 Jan 6;89(1):177-93.

Wertz A, Trenholm S, Yonehara K, Hillier D, Raics D, Leinweber M, Szalay G, Ghanem A, Keller G, Rózsa B, Conzelmann KK, **Roska B**. Single-cell-initiated Monosynaptic Tracing Reveals Layer-specific Cortical Network Modules. **Science**. 2015, 349 (6243):70-4

Szikra T, Trenholm S, Drinnenberg A, Jüttner J, Raics Z, Farrow K, Biel M, Awatramani G, Clark D, Sahel JA, da Silveira RA, **Roska B** During daylight rods act as relay cells conveying cone-driven horizontal cell-mediated surround inhibition to downstream visual circuits. **Nature Neuroscience**. 2014, 17(12):1728-35

Buskamp V, Krol J, Nelidova D, Daum J, Szikra T, Tsuda B, Jüttner 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*** MiRNAs 182 and 183 are necessary to maintain adult cone photoreceptor outer segments and visual function (*shared corresponding authors) **Neuron**. 2014, 83(3):586-600

Yonehara K, Farrow K, Ghanem A, Hillier D, Balint K, Teixeira M, Jüttner J, Noda M, Neve R, Conzelmann KK, **Roska B**. The first stage of cardinal direction selectivity is localized to the dendrites of retinal ganglion cells. **Neuron**. 2013, 79(6):1078-85

Farrow K, Teixeira M, Szikra T, Jüttner J, Viney JT, Balint K, Yonehara K, **Roska B**. Ambient illumination toggles a neuronal circuit switch in the retina and visual perception at cone threshold **Neuron**. 2013, 78, 1–14

Siebert S, Cabuy E, Gross Scherf B, Kohler H, Panda A, Le YZ, Fehling HJ, Gaidatzis DG, Stadler MB, **Roska B**. Transcriptional code and disease map for adult retinal cell types. **Nature Neuroscience**. 2012 Jan 22;15(3):487-95

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

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**. Genetic reactivation of cone photoreceptors restores visual responses in retinitis pigmentosa. *Science*. 2010, 329(5990):413-7.

Krol J, Busskamp V, Markiewicz I, Stadler MB, Ribi S, Duebel J, Oertner TO, Schübeler D, Schrott G, Fehling HJ, Richter J, Bibbel M, **Roska B*** and Filipowicz W*. Characterization of microRNAs induced by light adaptation in mouse retina reveals rapid turnover as a common property of neuronal microRNAs. (*shared corresponding authors) *Cell*. 2010,141(4):618-31.

Münch TA, da Silveira RA, Siegert S, Viney TJ, Awatramani GB, **Roska B**. Approach sensitivity in the retina processed by a multifunctional neural circuit. *Nature Neuroscience*. 2009 Oct; 12(10):1308-16.

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

Boldogkoi Z, Balint K, Awatramani GB, Balya D, Busskamp V, Viney TJ, Lagali PS, Duebel J, Pásti E, Tombácz D, Tóth JS, Takács IF, Scherf BG, **Roska B**. Genetically timed, activity-sensor and rainbow transsynaptic viral tools. *Nature Methods*. 2009 Feb; 6(2):127-30.

Lagali PS, Balya D, Awatramani GB, Münch TA, Kim DS, Busskamp V, Cepko CL, **Roska B**. Light-activated channels targeted to ON bipolar cells restore visual function in retinal degeneration. *Nature Neuroscience*. 2008 Jun; 11(6):667-75.

Roska B, Werblin F. Rapid global shifts in natural scenes block spiking in specific ganglion cell types. *Nature Neuroscience*. 2003 Jun; 6(6):600-8.

Roska B, Werblin F. Vertical interactions across ten parallel, stacked representations in the mammalian retina. *Nature*. 2001 Mar 29; 410(6828):583-7.

Reviews and previews

Sahel JA, **Roska B**. Gene therapy for blindness. *Annual Reviews Neuroscience*. 2013, 36: 467-88.

Yonehara K, **Roska B**. Motion detection: neuronal circuit meets theory. *Cell*. 2013, 154(6):1188-9.

Packer, AM, **Roska, B** and Hausser, M. Targeting neurons and photons for optogenetics. *Nature Neuroscience* 2013, 16: 805-815

Busskamp, V., Picaud, S., Sahel, J.A., and **Roska, B**. Optogenetic therapy for retinitis pigmentosa. *Gene Therapy*. 2012, 19:169–175.

Busskamp, V., and **Roska, B.** Optogenetic approaches to restoring visual function in retinitis pigmentosa. *Current Opinion in Neurobiology* 2011, 21:942–946.

Azeredo da Silveira, R., and **Roska, B.** Cell types, circuits, computation. *Current Opinion in Neurobiology* 2011, 21: 664–671.

Contribution to technology development

Tang CYJ, Szikra T, Kozorovitskiy Y, Teixeira M, Sabatini B, **Roska B**, Cepko C. Cell-specific gene manipulation by co-opting fluorescent proteins as scaffolds for transcriptional regulation. *Cell* 2013 154 (4):928-939

Di Meglio T, Kratochwil CF, Vilain N, Loche A, Vitobello A, Yonehara K, Hrycaj SM, **Roska B**, Peters AH, Eichmann A, Wellik D, Ducret S, Rijli FM. Ezh2 orchestrates topographic migration and connectivity of mouse precerebellar neurons. *Science* 2013 Jan 11;339(6116):204-7.

Katona G, Szalay G, Maák P, Kaszás A, Veress M, Hillier D, Chiovini B, Vizi ES, **Roska B**, Rózsa B. Fast two-photon in vivo imaging with three-dimensional random-access scanning in large tissue volumes. *Nature Methods* 2012 Jan 8;9(2):201-8.

Fiscella M, Farrow K, Jones IL, Jäckel D, Müller J, Frey U, Bakkum DJ, Hantz P, **Roska B**, Hierlemann A. Recording from defined populations of retinal ganglion cells using a high-density CMOS-integrated microelectrode array with real-time switchable electrode selection. *J Neuroscience Methods* 2012 Oct 15;211(1):103-13.

Book contributions

Roska, B. and Meister, M. (2014) The Retina Dissects the Visual Scene into Distinct Features. Book chapter. The New Visual Neurosciences. MIT Press.

The entire publication list can be downloaded from

http://www.fmi.ch/members/botond.roska/AllPapers_BotondRoska.pdf

Training postdocs and graduate students

Trained/currently training 19 postdoctoral students. Trained/currently training 8 graduate students.

8 former students are currently associate professors or independent group leaders. Two previous group leaders are have ERC grants.

Other Activities

Articles reviewed: Nature, Science, Nature Neuroscience, Nature Methods, Neuron, Journal of Neuroscience

Proposals reviewed: Swiss, EU and International grants