CURRICULUM VITAE

1. Personal data

a. Name:	Heinz Wässle
b. Nationality:	German and Austrian
c. Date of birth:	11 October 1943
d. Place of birth:	Salzburg, Austria

2. Education

a. Ludwig Maximilians University, Munich: Study of Physics - Nov. 1962 - Dec. 1968

b. Max-Planck-Institute of Psychiatry - Training in Neurophysiology - Jan. 1969 - Feb. 1972

3. Degrees

a. Masters Degree in Physics, "Magna cum laude"
(Diplomphysiker, Universität München, 20 Dec. 1968)

b. Doctor of Philosophy in Physics, "Summa cum laude"
(Dr. rer. nat., Universität München, 25 Feb. 1972)

c. Habilitation in Physiological Psychology and Animal Physiology
(Universität Konstanz, 19 Apr. 1978)

d. Professor of Biology
(Universität Mainz, 26 Oct. 1982)

4. Previous appointments

May 1967	-	Dec 1968	Institute of Medical Optics, Department of Physics, University of Munich
Jan 1969	-	Mar 1973	Dept. of Neurophysiology, Max-Planck-Institute of Psychiatry, Munich
Mar 1972	-	May 1972	Dept. Biophysics, King's College, University of London
Apr 1973	-	May 1974	Dept. of Physiology, The John Curtin School of Medical Research, Australian National University, Canberra
June 1974	-	June 1977	Dept Physiological Psychology, University of Constance
July 1977	-	July 1981	Friedrich-Miescher-Laboratorium of the Max-Planck-Society, Tübingen
Aug 1981	-	Oct 2008	Director, Dept. Neuroanatomy, Max-Planck-Institute for Brain Research, Frankfurt

5. Experimental research

During my studies of physics at the University of Munich I developed an interest in physiological optics and, therefore joined the Institute of Medical Optics, University of Munich. There I performed experiments in the psychophysics of vision to obtain my Masters degree in Physics (Diplomarbeit).

In order to learn more about the neurophysiological basis of vision, I joined the laboratory of Otto D. Creutzfeldt at the Max-Planck-Institute for Psychiatry in Munich. Under his supervision I studied the different components of the visual system which limit spatial resolution. I measured the modulation transfer function of the cat eye and, by electrophysiological recordings, the grating resolution of individual ganglion cells. Furthermore I simulated in a homogeneous network of neurons how excitation and inhibition influence spatial resolution. Based on this work I obtained a Ph.D. in Physics. At the same time I attended a graduate program in neurobiology sponsored by the Volkswagen Foundation.

Because visual acuity is limited by the sampling properties of the retina, I wanted to learn more about retinal circuitry. I spent part of 1972 in London, working with Brian Boycott, F.R.S., in the MRC Cell Biophysics Unit, Department of Biophysics, King's College, London. We succeeded in morphologically classifying cat retinal ganglion cells and thus defining the anatomical basis of parallel processing in the ascending visual pathway.

In 1973 I went for a postdoctoral training to the John Curtin School of Medical Research in Canberra (Australia). In the lab of Peter Bishop, F.R.S., I worked with Brian Cleland and William R. Levick, F.R.S., on a physiological/morphological identification of retinal ganglion cells. We showed that the physiological brisk-transient (Y) cells corresponds to the morphological alpha cell type.

After returning to Germany I was able to establish my own small lab at the University of Constance. The structure and function of the mammalian retina was in the meantime my major scientific interest. Leo Peichl was my first Ph.D. student and in a continued co-operation with Brian Boycott, F.R.S., we studied the mosaics of retinal neurons, established their regular arrays and the territorial behaviour of their dendritic fields. This type of analysis was performed for horizontal cells and different classes of retinal ganglion cells. The independent mosaics of ON- and OFF-ganglion cells were established.

In 1977 the Max-Planck-Society offered me a group leader position (Nachwuchs-gruppenleiter) at the Friedrich-Miescher Laboratory in Tübingen. During the four years in Tübingen we worked on the projection of the different ganglion cell classes to the visual centers of the brain thus elaborating further the idea of parallel pathways in the visual system. We also continued our studies of retinal mosaics and retinal circuits. We started to work on retinal transmitters using iontophoresis and extracellular recordings from the *in vivo* retina. By these approaches we could show, how inhibitory neurotransmitters such as GABA and glycine influence light responses of retinal ganglion cells.

In 1980 the Max-Planck-Society offered me the Directorship of the Department of Neuroanatomy at the Max-Planck-Institute for Brain Research in Frankfurt (Main). In 1981 we moved the lab to Frankfurt and continued our studies of mammalian retinal organization. Immunocytochemical methods became available for selective labeling of cell types and for the study of retinal circuits. In addition we used electron microscopy to study synaptic interactions in the retina. We also established during the years different *in vitro* models (dissociated cells, retinal slices and retinal whole mounts) and studied retinal circuits in the rat with the patch clamp method. In parallel we performed an anatomical analysis of the primate retina. The focus of our work was on the rod circuit of the mammalian retina and on parallel pathways through the primate retina. Both in rodents and in primates we were able to identify at least 10 different types of bipolar cells and study their connectivity. In recent years we have become very much involved with transmitter-receptors in the retina and their synaptic localization. In this context most of our studies are

now performed on the mouse retina because of the continuously increasing availability of mutant mice which offer the possibility to delete specific transmitter receptors and also to label circuits by the expression of molecular markers such as green fluorescent protein. Although this involved more and more molecular tools, the question of how the eye, the window to the brain, works was always in the center of our interest. In 2008 the Department of Neuroanatomy was closed because of my retirement.

6. List of publications

1. Wässle, H. und Heinrich, F. (1970). Untersuchungen zum Helligkeitskontrast. Vision Res. 10, 361-373.

2. Wässle, H. (1971). Optical quality of the cat eye. Vision.Res. 11, 995-1006.

3. Singer, W. and Wässle, H. (1971). The lateral geniculate body: a multichannel filter for spatial and temporal stimulus parameters. Proc. of First European Biophysics Congress. (E. Broda, A. Locker and H. Springer-Lederer, Herausgeber: Wiener Medizinische Akademie).

4. Wässle, H. and Creutzfeldt, O.D. (1973). Spatial resolution in the visual system. A theoretical and experimental study on single units in the cat's lateral geniculate body. J. Neurophysiol. 36, 13-27.

5. Boycott, B.B. and Wässle, H. (1974). The morphological types of ganglion cells of the domestic cat's retina. J. Physiol. 240, 397-419.

6. Wässle, H., Levick, W.R. and Cleland, B.G. (1975). The distribution of the alpha type of ganglion cells in the cat's retina. J. Comp. Neurol. 159, 419-438.

7. Cleland, B.G., Levick, W.R. and Wässle, H. (1975). Physiological identification of a morphological class of cat retinal ganglion cells. J. Physiol. 248, 151-171.

8. Kirk, D.L., Cleland, B.G., Wässle, H. and Levick, W.R. (1975). Axonal conduction latencies of cat retinal ganglion cells in central and peripheral retina. Exp. Brain Res. 23, 85-90.

9. Wässle, H., Levick, W.R., Kirk, D.L. and Cleland, B.G. (1975). Axonal conduction velocity and perikaryal size. Exp. Neurol. 49, 246-251.

10. Kirk, D.L., Levick, W.R., Cleland, B.G. and Wässle, H. (1976). Crossed and uncrossed representation of the visual field by brisk-sustained and brisk-transient cat retinal ganglion cells. Vision Res. 16, 225-231.

11. Wässle, H. (1975). A stereotaxic headholder for visual neurophysiology. Exp., Brain Res. 23, 151-156.

12. Hughes, A. and Wässle, H. (1976). The cat optic nerve: Fibre total count and diameter spectrum. J. Comp. Neurol. 169, 171-184.

13. Wässle, H. and Riemann, H.J. (1978). The mosaic of nerve cells in the mammalian retina. Proc. Roy. Soc. B. 200, 441-461.

14. Skrandies, W. Wässle, H. and Peichl, L. (1978). Are field potentials an appropriate method for demonstrating connections in the brain. Exp. Neurol. 60, 509-521.

15. Boycott, B.B., Peichl, L. and Wässle, H. (1978). Morphological types of horizontal cells in the retina of the domestic cat. Proc. Roy. Soc. B. 203, 247-267.

16. Wässle, H., Boycott, B.B. and Peichl, L. (1978). Receptor contacts of horizontal cells in the retina of the domestic cat. Proc. Roy. Soc. B. 203, 247-267.

17. Wässle, H., Peichl, L. and Boycott, B.B. (1978). Topography of horizontal cells in the retina of the domestic cat. Proc. Roy. Soc. B. 203, 269-291.

18. Peichl, L. and Wässle, H. (1979). Size, scatter and coverage of ganglion cell receptive field centres in the cat retina. J. Physiol. 291, 117-141.

19. Illing, R.-B. and Wässle, H. (1979). Visualization of the HRP reaction product using the polarization microscope. Neurosci. Lett. 13, 7-11.

20. Hughes, A. and Wässle, H. (1979). An estimate of image quality in the rat eye. Invest. Ophthalmol. 18, 878-881.

21. Wässle, H., Peichl, L. and Boycott, B.B. (1979). Quantification of horizontal cells in the domestic cat retina. Progress in Brain Research, Vol. 51 (eds. M. Cuenod, G.W. Kreutzberg and F.E. Bloom). Elsevier, Amsterdam, pp. 373-388.

22. Wässle, H., Illing, R.-B. and Peichl, L. (1979). Morphologische Klassen und zentrale Projektion von Ganglienzellen in der Retina der Katze. Verhandlungen der Deutschen Zoologischen Gesellschaft (Hrsg. W. Rathmayer). Gustav Fischer Verlag, Stuttgart, pp. 180-193.

23. Wässle, H. and Illing, R.-B. (1980). The retinal projection to the superior colliculus in the cat: a quantitative study with HRP. J. Comp. Neurol. 190, 333-356.

24. Wässle, H. and Hausen, K. (1981). Extracellular marking and retrograde labelling of neurons. In: Techniques in Neuroanatomical Research (Eds.: Ch. Heym and W.G. Forssmann). Springer Verlag, Berlin, Heidelberg, New York, pp. 317-338.

25. Peichl, L. and Wässle, H. (1981). Morphological identification of on- and off-centre brisk transient(Y) cells in the cat retina. Proc. Roy. Soc. B. 212, 139-156.

26. Wässle, H., Peichl, L. and Boycott, B.B. (1981). Morphology and topography of on- and off-alpha cells in the cat retina. Proc. Roy. Soc. B. 212, 157-175.

27. Wässle, H., Boycott, B.B. and Illing, R.-B. (1981). Morphology and mosaic of on- and off-beta cells in the cat retina and some functional considerations. Proc. Roy. Soc. B. 212, 177-195.

28. Wässle, H. (1981). Morphological types and topographical distribution of ganglion cells in the cat retina. Adv. Physiol. Sci.Vol. 2. Regulatory Functions of the CNS Subsystems. J. Szentagothai, J. Hamori, M. Palkovits (eds). pp. 245-254.

29. Vaney, D.I., Peichl, L.,Wässle, H. and Illing,R.-B. (1981). Almost all ganglion cells in the rabbit retina project to the superior colliculus. Brain Res. 212, 447-453.

30. Wässle, H., Peichl, L. and Boycott, B.B. (1981). Dendritic territories of cat retinal ganglion cells. Nature 292, 344-345.

31. Illing, R.. B. and Wässle, H. (1981). The retinal projection to the thalamus in the cat: quantitative investigation and a comparison with the retinotectal pathway. J. Comp. Neurol. 202, 265-285.

32. Wässle, H. (1982). Morphological types and central projections of ganglion cells in the cat retina. Progress in Retinal Research. (Eds. N. Osborne and G. Chader) Pergamon Press, Oxford, New York, Frankfurt, Paris, pp. 125-152.

33. Bolz, J., Rosner, G. and Wässle, H. (1982). Response latency of brisk-sustained(X) and brisk-transient(Y) cells in the cat retina. J. Physiol. 328, 171-190.

34. Wässle, H., Peichl, L. and Boycott, B.B. (1983). Mosaics and territories of cat retinal ganglion cells. Progress in Brain Research 58, 183-190.

35. Peichl, L. and Wässle, H. (1983). The structural correlate of the receptive field centre of alpha ganglion cells in the cat retina. J. Physiol. 341, 309-324.

36. Wässle, H., Peichl, L. and Boycott, B.B. (1983). A spatial analysis of ON- and OFF-ganglion cells in the cat retina.Vision Res. 23, 1151-1160.

37. Voigt, T., Naito, J. and Wässle, H. (1983). Retinotopic scatter of optic tract fibres in the cat. Exp. Brain Res. 52, 25-33.

38. Thier, P. and Wässle, H. (1984). Indoleamine-mediated reciprocal modulation of ON- and OFF-ganglion cells in the retina of the cat. J. Physiol. 351, 613-630.

39. Bolz, J., Wässle, H. and Thier, P. (1984). Pharmacological modulation of ON- and OFF-ganglion cells in the cat retina. Neuroscience 12, 875-885.

40. Wässle, H. (1984). Retinale Ganglienzellen und ihre Projektion in die visuellen Gehirnzentren. In: Pathophysiologie des Sehens. V. Herzau (Hrsg.), Ferdinand Enke Verlag Stuttgart, 1984, pp. 2-9.

41. Wässle, H. (1985). Auge und Gehirn: Informationsverarbeitung im visuellen System der Säugetiere. In: Verhandlungen der Gesellschaft Deutscher Naturforscher und Ärzte, 113. Versammlung, Wissenschaftliche Verlagsgesellschaft mbH Stuttgart, pp. 227-242.

42. Bolz, J., Frumkes, T., Voigt, T. and Wässle, H. (1985). Action and localization of gamma-aminobutyric acid in the cat retina. J. Physiol. 362, 369-393.

43. Bolz, J., Thier, P., Voigt, T. and Wässle, H. (1985). Action and localization of glycine and taurine in the cat retina. J. Physiol. 362, 395-413.

44. Schmidt, M., Wässle, H. and Humphrey, M. (1985). Number and distribution of putative cholinergic neurons in the cat retina. Neurosci. Lett. 59, 235-240.

45. Eysel, U.T., Peichl, L. and Wässle, H. (1985). Dendritic plasticity in the early postnatal feline retina: quantitative characteristics and sensitive period. J. Comp. Neurol. 242, 134-145.

46. Wässle, H., Schäfer-Trenkler, I. and Voigt, T. (1986). Analysis of a glycinergic inhibitory pathway in the cat retina. J. Neurosci. 6, 594-604.

47. Wässle, H. (1986). Auge und Gehirn: Informationsverarbeitung im visuellen System der Säugetiere. UMSCHAU 5, 290-296.

48. Karschin, A., Wässle, H. and Schnitzer, J. (1986). Shape and distribution of astrocytes in the cat retina. Invest. Ophthalmol Vis. Sci., 27, 828-831.

49. Karschin, A., Wässle, H. and Schnitzer, J. (1986). Immunocytochemical studies on astroglia of the cat retina under normal and pathological conditions. J. Comp. Neurol. 249, 564-576.

50. Wässle, H., Voigt, T., Schmidt, M. and Humphrey, M. (1986). Action and localization of neurotransmitters in the cat retina. Neurosci. Res. 4, 181-195.

51. Wässle, H. (1986). Sampling of visual space by retinal ganglion cells. In: Visual Neuroscience. (Eds. J.D. Pettigrew, K.J. Sanderson & W.R. Levick) Cambridge University Press, pp. 19-32.

52. Jäger, J. and Wässle, H. (1987). Localization of glycine uptake and receptors in the cat retina. Neurosci. Lett. 75, 147-151.

53. Röhrenbeck, J., Wässle, H. and Heizmann, C.W. (1987). Immunocytochemical labelling of horizontal cells in mammalian retina using antibodies against calcium-binding proteins. Neurosci. Lett. 77, 255-260.

54. Wässle, H., Voigt, T. and Patel, B.T. (1987). Morphological and immunocytochemical identification of indoleamine-accumulating neurons in the cat retina. J. Neurosci. 7, 1574-1586.

55. Schmidt, M., Humphrey, M.F. and Wässle, H. (1987). Action and localization of acetylcholine in the cat retina. J. Neurophysiol. 58, 997-1015.

56. Wässle, H., Chun, M.H. and Müller, F. (1987). Amacrine cells in the ganglion cell layer of the cat retina. J. Comp. Neurol. 265, 391-408.

57. Voigt, T. and Wässle, H. (1987). Dopaminergic innervation of AII amacrine cells in mammalian retina. J. Neurosci. 7, 4115-4128.

58. Wässle, H. (1988). Dendritic maturation of retinal ganglion cells. Trends in Neuroscience 11, 87-89.

59. Wässle, H., Chun, M.-H., Voigt, T. and Schmidt, M. (1988). Transmitter localization in the mammalian retina. In: "Sense Organs. Interfaces between Environment and Behaviour". Eds.: N. Elsner and F.G. Barth, Georg Thieme Verlag, Stuttgart, pp. 47-55.

60. Skrandies, W. and Wässle, H. (1988). Dopamine and serotonin in cat retina: electroretinography and histology. Exp. Brain Res. 71, 231-240.

61. Müller, F.,Wässle, H. and Voigt, T. (1988). Pharmacological modulation of the rod pathway in the cat retina. J. Neurophysiol. 59, 1657-1672.

62. Brecha, N., Johnson, D., Peichl, L. and Wässle, H. (1988). Cholinergic amacrine cells of the rabbit retina contain glutamate decarboxylase and gamma-aminobutyrate immunoreactivity. Proc. Natl. Acad. Sci. USA 85, 6187-6191.

63. Wässle, H. and Chun, M.-H. (1988). Dopaminergic and indoleamine-accumulating amacrine cells express GABA-like immunoreactivity in the cat retina. J. Neurosci. 8, 3383-3394.

64. Chun, M.-H., Wässle, H. and Brecha, N. (1988). Colocalization of (^{3}H)muscimol uptake and choline acetyltransferase immunoreactivity in amacrine cells of the cat retina. Neurosci. Lett. 94, 259-263.

65. Wässle, H. and Chun, M.-H. (1989). GABA-like immunoreactivity in the cat retina: light microscopy. J. Comp. Neurol. 279, 43-54.

66. Chun, M.-H. and Wässle, H. (1989). GABA-like immunoreactivity in the cat retina: electron microscopy. J. Comp. Neurol. 279, 55-67.

67. Wässle, H., Müller, F., Voigt, T. and Chun, M.-H. (1989). Pharmacological modulation of the dark adapted cat retina. In: Neurobiology of the Inner Retina. Eds.: R.Weiler and N.N. Osborne, NATO ASI Series, Vol. H31, Springer Verlag Berlin, Heidelberg, pp. 247-259.

68. Röhrenbeck, J., Wässle, H. and Boycott, B.B. (1989). Horizontal cells in the monkey retina: immunocytochemical staining with antibodies against calcium binding proteins. Eur. J. Neurosci. 1, 407-420.

69. Wässle, H., Boycott, B.B., and Röhrenbeck, J. (1989). Horizontal cells in the monkey retina: cone connections and dendritic network. Eur. J. Neurosci. 1, 421-435.

70. Wässle, H., Grünert, U., Röhrenbeck, J. and Boycott, B.B. (1989). Cortical magnification factor and the ganglion cell density of the primate retina. Nature 341, 643-646.

71. Lennie, P., Trevarthen, C., van Essen, D. and Wässle, H. (1990). Parallel Processing of Visual Information.In "Visual Perception: The Neurophysiological Foundations". Eds.: L. Spillmann and J.S. Werner. Academic Press, pp. 103-128.

72. Karschin, A. and Wässle, H. (1990). Voltage- and transmitter-gated currents in isolated rod bipolar cells of the rat retina. J. Neurophysiol. 63, 860-876.

73. Grünert, U. and Wässle, H. (1990). GABA-like immunoreactivity in the macaque monkey retina: A light and electronmicroscopic study. J. Comp. Neurol. 297, 509-524.

74. Wässle, H., Grünert, U., Röhrenbeck, J., and Boycott, B.B. (1990). Retinal ganglion cell density and cortical magnification factor in the primate. Vision Res. 30, 1897-1911.

75. Boos, R., Müller, F. and Wässle, H. (1990). Actions of excitatory amino acids in the cat retina. J. Neurophysiol. 64, 1368-1379.

76. Greferath, U., Grünert, U. and Wässle H. (1990). Rod bipolar cells in the mammalian retina show protein kinase C-like immunoreactivity. J. Comp. Neurol. 301, 433-442.

77. Wässle, H. and Boycott, B.B. (1991). Functional architecture of the mammalian retina. Physiol. Rev. 71, 447-480.

78. Yamashita, M. and Wässle, H. (1991). Reversal potential of GABA-induced currents in rod bipolar cells of the rat retina. Visual Neurosci. 6, 399-401.

79. Yamashita, M. and Wässle, H. (1991). Responses of rod bipolar cells isolated from the rat retina to the glutamate agonist 2-amino-4-phosphonobutyric acid (APB). J. Neurosci. 11, 2372-2382.

80. Wässle, H., Yamashita, M., Greferath, U., Grünert, U. and Müller, F. (1991). The rod bipolar cell of the mammalian retina. Visual Neurosci. 7, 99-112.

81. Boycott, B.B. and Wässle, H. (1991). Morphological classification of bipolar cells of the primate retina. Eur. J. Neurosci. 3, 1069-1088.

82. Chun, M.H., Brecha, N. and Wässle, H. (1992). Light- and electron-microscopic studies of the somatostatin-immunoreactive plexus in the cat retina. Cell Tissue Res. 267, 57-66.

83. Wässle, H., Grünert, U., Cook, N.J. and Molday, R.S. (1992). The cGMP-gated channel of rod outer segments is not localized in bipolar cells of the mammalian retina. Neurosci. Lett. 134, 199-202.

84. Müller, F., Greferath, U., Wässle, H., Wisden, W. and Seeburg, P. (1992). Glutamate receptor expression in the rat retina. Neurosci. Lett. 138, 179-182.

85. Müller, F., Boos, R. and Wässle, H. (1992). Actions of GABAergic ligands on brisk ganglion cells in the cat retina.Visual Neurosci. 9, 415-425.

86. Grünert, U., Greferath, U., Boycott, B.B. and Wässle H. (1993). Parasol (Pα) ganglion-cells of the primate fovea: Immunocytochemical staining with antibodies against $GABA_A$-receptors. Vision Res. 33, 1-14.

87. Feigenspan, A., Wässle, H. and Bormann, J. (1993). Pharmacology of GABA receptor Cl^- channels in rat retinal bipolar cells. Nature 361, 159-162.

88. Feigenspan, A.,Bormann, J. and Wässle, H. (1993). Organotypic slice culture of the mammalian retina. Visual Neurosci. 10, 203-217.

89. Greferath, U., Müller, F., Wässle, H., Shivers, B. and Seeburg, P. (1993). Localization of $GABA_A$ receptors in the rat retina.Visual Neurosci. 10, 551-561.

90. Wässle, H., Grünert, U. and Röhrenbeck, J. (1993). Immunocytochemical staining of AII-amacrine cells in the rat retina with antibodies against parvalbumin. J. Comp. Neurol. 332, 407-420.

91. Chun, M.-H., Han, S.-H., Chung, J.-W. and Wässle, H. (1993). Electron microscopic analysis of the rod pathway of the rat retina. J. Comp. Neurol. 332, 421-432.

92. Boos, R., Schneider, H. and Wässle, H. (1993). Voltage- and transmitter-gated currents of AII-amacrine cells in a slice preparation of the rat retina. J. Neurosci. 13, 2874-2888.

93. Chun, M.-H. and Wässle, H. (1993). Some horizontal cells of the bovine retina receive input in the inner plexiform layer. Cell Tissue Res. 272, 447-457.

94. Grünert, U. and Wässle, H. (1993). Immunocytochemical localization of glycine receptors in the mammalian retina. J. Comp. Neurol. 335, 523-537.

95. Wässle, H. (1993). Vision in darkness: The rod circuit of the mammalian retina. In:"Gene - Brain - Behaviour". Eds.: N. Elsner and M. Heisenberg, Georg Thieme Verlag, Stuttgart, pp.129-141.

96. Greferath, U., Grünert, U., Möhler, H. and Wässle, H. (1993). Cholinergic amacrine cells of the rat retina express the δ-subunit of $GABA_A$-receptor. Neurosci. Lett. 163, 71-73.

97. Wässle, H., Grünert, U., Martin P.R.. and Boycott, B.B. (1994). Immunocytochemical characterization and spatial distribution of midget bipolar cells in the macaque monkey retina. Vision Res. 34, 561-579.

98. Greferath, U., Grünert, U., Müller, F. and Wässle, H. (1994). Localization of $GABA_A$ receptors in the rabbit retina. Cell Tissue Res. 276, 295-307.

99. Greferath, U., Brandstätter, J.H., Wässle, H., Kirsch, J., Kuhse, J., and Grünert U. (1994). Differential expression of glycine receptor subunits in the retina of the rat: A study using immunohistochemistry and *in situ* hybridization. Visual Neurosci. 11, 721-729.

100. Hartveit, E., Brandstätter, J.H., Sassoè-Pognetto, M., Laurie, D.J., Seeburg, P.H. and Wässle, H. (1994). Localization and developmental expression of the NMDA receptor subunit NR2A in the mammalian retina. J. Comp. Neurol. 348, 570-582.

101. Sassoè-Pognetto, M., Wässle, H. and Grünert, U. (1994). Glycinergic synapses in the rod pathway of the rat retina: cone bipolar cells express the α1 subunit of the glycine receptor. J. Neurosci. 14, 5131-5146.

102. Brandstätter, J.H., Hartveit, E., Sassoè-Pognetto, M. and Wässle, H. (1994). Expression of NMDA- and high-affinity kainate receptor subunit mRNAs in the adult rat retina. Eur. J. Neurosci. 6, 1100-1112.

103. Grünert, U., Martin P.R. and Wässle, H. (1994). Immunocytochemical diversity of bipolar cells in the macaque monkey retina. J. Comp. Neurol. 348, 607-627.

104. Wässle, H., Grünert, U., Martin, P.R. and Boycott, B.B. (1994). Color Coding in the Primate Retina: Predictions and Constraints from Anatomy. Otto Creutzfeldt Symposium. In: Structural and functional Organization of the Neocortex. B. Albowitz, K. Albus, U. Kuhnt, H.-Ch. Nothdurft, P. Wahle (Eds.) Springer Verlag, Heidelberg, pp. 94-104.

105. Greferath, U., Grünert, U., Fritschy, J.M., Stephenson, A., Möhler, H. and Wässle, H. (1995). $GABA_A$ receptor subunits have differential distributions in the rat retina: *in situ* hybridization and immunohistochemistry. J. Comp. Neurol. 353, 553-571.

106. Brandstätter, J.H., Greferath,U., Euler, T. and Wässle, H. (1995). Co-stratification of $GABA_A$ receptors with the directionally selective circuitry of the rat retina. Vis. Neurosci. 12, 345-358.

107. Sassoè-Pognetto, M., Kirsch, J., Grünert, U., Greferath, U., Fritschy, J.M., Möhler, H., Betz, H. and Wässle, H. (1995). Co-localization of gephyrin and $GABA_A$-receptor subunits in the rat retina. J. Comp. Neurol. 357, 1-14.

108. Wässle, H. (1995). Das Fenster zum Gehirn. In: Faszination in 3 Dimensionen, CHIP Spezial - Bild der Wissenschaft, Vogel Verlag, Würzburg, pp. 13-18.

109. Enz, R., Brandstätter, J.H., Hartveit, E., Wässle, H. and Bormann, J. (1995). Expression of GABA receptor ρ1 and ρ2 subunits in the retina and brain of the rat. Europ. J. Neurosci. 7, 1495-1501.

110. Hartveit, E., Brandstätter, J.H., R. Enz and Wässle, H. (1995). Expression of the mRNA of seven metabotropic glutamate receptors (mGluR1 to 7) in the rat retina. An *in situ* hybridization study on tissue sections and isolated cells. Europ. J. Neurosci. 7, 1472-1783.

111. Wässle, H., Grünert, U., Chun, M.-H. and Boycott, B.B. (1995). The rod pathway of the macaque monkey retina: identification of AII-amacrine cells with antibodies against calretinin. J. Comp. Neurol. 361, 537-551.

112. Euler, T. and Wässle, H. (1995). Immunocytochemical identification of cone bipolar cells in the rat retina. J. Comp. Neurol. 361, 461-478.

113. Taylor, W.R. and Wässle, H. (1995). Receptive field properties of starburst cholinergic amacrine cells in the rabbit retina. Eur. J. Neurosci. 7, 2308-2321.

114. Grünert, U. and Wässle, H. (1996). Glycine receptors in the rod pathway of the macaque monkey retina. Vis. Neurosci. 13, 101-115.

115. Koulen, P., Sassoè-Pognetto, M., Grünert, U. and Wässle, H. (1996). Selective clustering of $GABA_A$ and glycine receptors in the mammalian retina. J. Neurosci. 16, 2127-2140.

116. Euler, T., Schneider, H. and Wässle, H. (1996). Glutamate responses of bipolar cells in a slice preparation of the rat retina. J. Neurosci. 16, 2934-2944.

117. Brandstätter, J.H., Wässle, H., Betz, H. and Morgans, C.W. (1996). The plasma membrane protein SNAP-25, but not syntaxin, is present at photoreceptor and bipolar cell synapses in the rat retina. Eur. J. Neurosci. 8, 823-828.

118. Sassoè-Pognetto, M., Feigenspan, A., Bormann, J. and Wässle, H. (1996). Synaptic organization of an organotypic slice culture of the mammalian retina. Vis. Neurosci. 13, 759-771.

119. Chun, M.-H., Grünert, U., Martin, P.R. and Wässle, H. (1996). The synaptic complex of cones in the fovea and in the periphery of the macaque monkey retina. Vision Res. 36, 3383-3395.

120. Brandstätter, J.H., Löhrke, S, Morgans, C.W. and Wässle, H. (1996). Distribution of two homologous synaptic vesicle proteins, synaptoporin and synaptophysin, in the mammalian retina. J. Comp. Neurol. 370, 1-10.

121. Enz, R., Brandstätter, J.H., Wässle, H. and Bormann, J. (1996) Immunocytochemical localization of the $GABA_C$ receptors ρ subunits in the mammalian retina. J. Neurosci. 16, 4479-4490.

122. Koulen, P., Malitschek, B., Kuhn, R., Wässle, H. and Brandstätter, J.H. (1996). Group II and group III metabotropic glutamate receptors in the rat retina: distribution and developmental expression patterns. Eur. J. Neurosci. 8, 2177-2187.

123. Brandstätter, J.H., Koulen, P., Kuhn, R., van der Putten, H. and Wässle, H. (1996). Compartmental localization of a metabotropic glutamate receptor (mGluR7): two different active sites at a retinal synapse. J. Neurosci. 16, 4749-4756.

124. Morgans, C.W., Brandstätter, J.H., Kellerman, J., Betz, H. and Wässle, H. (1996). A SNARE complex containing syntaxin 3 is present in ribbon synapses of the retina. J. Neurosci. 16, 6713-6721.

125. Rauen, T., Rothstein, J.D. and Wässle, H. (1996) Differential expression of three glutamate transporter subtypes in the rat retina. Cell Tissue Res. 286, 325-336.

126. Veruki, M.L. and Wässle, H. (1996) Immunohistochemical localization of Dopamine D1 receptors in rat retina. Eur. J. Neurosci. 8, 2286-2297.

127. Koulen, P., Kuhn, R., Wässle, H. and Brandstätter, J.H. (1997) Group I metabotropic glutamate receptors mGluR1α and mGluR5a: Localization in both synaptic layers of the rat retina. J. Neurosci. 17, 2200-2211.

128. Koulen, P., Brandstätter, J.H., Kröger, S., Enz, R., Bormann, J. and Wässle H. (1997) Immunocytochemical localization of the $GABA_C$ receptor ρ-subunits in the cat, goldfish and chicken retina. J. Comp. Neurol. 380, 520-532.

129. Sassoè-Pognetto, M. and Wässle, H. (1997) Synaptogenesis in the rat retina: Subcellular localization of glycine receptors, $GABA_A$ receptors and the anchoring protein gephyrin. J. Comp. Neurol. 381, 158-174.

130. Brandstätter, J.H., Koulen, P. and Wässle, H (1997) Selective synaptic distribution of kainate receptor subunits in the two plexiform layers of the rat retina. J. Neurosci. 17, 9298-9307.

131. Koulen, P., Brandstätter, J.H., Enz, R., Bormann, J. and Wässle, H. (1998) Synaptic clustering of $GABA_C$ receptor ρ-subunits in the rat retina. Eur. J. Neurosci. 10, 115-127.

132. Brandstätter, J.H., Koulen, P. and Wässle, H. (1998) Diversity of glutamate receptors in the mammalian retina. Vision Res. 38, 1385-1397.

133. Wässle, H. Koulen, P., Brandstätter, J.H., Fletcher, E.L. and Becker, C..-M. (1998) Glycine and GABA receptors in the mammalian retina. Vision Res. 38, 1411-1430.

134. Euler, T. and Wässle, H. (1998) Different contributions of $GABA_A$ and $GABA_C$ receptors to rod and cone bipolar cells in a rat retinal slice preparation. J. Neurophysiol. 79, 1384-1395.

135. Fletcher, T., Koulen, P. and Wässle, H. (1998) $GABA_A$ and $GABA_C$ receptors on mammalian rod bipolar cells. J. Comp. Neurol. 396, 351-365.

136. Koulen, P., Garner, C.C. and Wässle, H. (1998) Immunocytochemical localization of the synapse-associated protein SAP102 in the rat retina. J. Comp. Neurol. 397, 326-336.

137. Koulen, P., Malitschek, B.., Kuhn, R., Bettler, B., Wässle, H. and Brandstätter, J.H. (1998) Presynaptic and postsynaptic localization of $GABA_B$ receptors in neurons of the rat retina. Eur. J. Neurosci. 10, 1446-1456.

138. Wässle, H., Peichl, L., Airaksinen, M.S. and Meyer, M. (1998) Calcium-binding proteins in the retina of a calbindin null mutant mouse. Cell Tissue Res. 292, 211-218.

139. Morgans, C.W., El Far, Ou., Berntson, A., Wässle, H. and Taylor, W.R. (1998) Calcium extrusion from mammalian photoreceptor terminals. J. Neurosci. 18, 2467-2474.

140. Menger, N., Pow, D.V. and Wässle, H. (1998) Glycinergic amacrine cells of the rat retina. J. Comp. Neurol. 401, 34-46.

141. Koulen, P., Fletcher, E.L., Craven, S.E., Bredt, D.S. and Wässle, H. (1998) Immunocytochemical localization of the postsynaptic density protein PSD-95 in the mammalian retina. J. Neurosci. 18, 10136-10149.

142. Wässle, H. (1999) Colour Vision: A patchwork of cones. Nature 397, 473-475.

143. Steffen, H., Menger, N., Richter, W. Nölle, B., Krastel, H., Stayer, C., Kolling, G.H., Wässle, H. and Meinck, H.-M. (1999) Immune-mediated retinopathy in a patient with stiff-man syndrome. Graefe's Arch. Clin. Exp. Ophthalmol. 237, 212-219.

144. Wässle, H. (1999) Mammalian Rod and Cone Pathways. In: The Retinal Basis of Vision. J.I. Toyoda, M. Murakami, A. Kaneko and T. Saito (Eds.) Elsevier Science B.V. pp. 185-195.

145. Boycott, B. and Wässle, H. (1999) Parallel Processing in the Mammalian Retina. The Proctor Lecture. Invest. Ophthalmol. Vis. Sci. 40, 1313-1327.

146. Wässle, H. (1999) Parallel pathways from the outer to the inner retina in primates. In: Color Vision: From Genes to Perception. K.R. Gegenfurtner and L.T. Sharpe (Eds.) Cambridge Univ. Press pp. 145-162.

147. Fletcher, E.L. and Wässle, H. (1999) Indoleamine-accumulating amacrine cells are presynaptic to rod bipolar cells via $GABA_C$ receptors. J. Comp. Neurol. 413, 155-167.

148. Koulen, P, Kuhn, R., Wässle, H. and Brandstätter, J.H. (1999) Modulation of the intracellular calcium concentration in photoreceptor terminals by a presynaptic metabotropic glutamate receptor. Proc. Natl. Acad. Sci. 96, 9909-9914.

149. Brandstätter, J. H., Fletcher E. L., Garner G. G., Gundelfinger E. D. and Wässle, H. (1999) Differential expression of the presynaptic cytomatrix protein bassoon among ribbon synapses in the mammalian retina. Eur. J. Neurosci. 11, 3683-3693.

150. Fletcher, E.L., Hack, I., Brandstätter, J.H. and Wässle, H. (2000) Synaptic localization of NMDA receptor subunits in the rat retina. J. Comp. Neurol. 420, 98-112..

151. Hirano, A.A., Hack, I., Wässle, H. and Duvoisin, R.M. (2000) Cloning and immunocytochemical localization of a cyclic nucleotide-gated channel α-subunit to all cone photoreceptors in the mouse retina. J. Comp. Neurol. 421, 80-94.

152. Haverkamp, S. and Wässle, H. (2000) Immunocytochemical analysis of the mouse retina. J. Comp. Neurol. 424, 1-23.

153. Wässle, H., Dacey, D.M., Haun, T., Haverkamp, S., Grünert, U. and Boycott, B.B. (2000) The Mosaic of Horizontal Cells in the Macaque Monkey Retina: with a Comment on Biplexiform Ganglion Cells. Visual Neurosci. 17, 591-608.

153. Menger, N. and Wässle, H. (2000) Morphological and physiological properties of the A17 amacrine cell of the rat retina. Visual Neurosci. 17, 769-780.

155. Kneussel, M.; Haverkamp, S., Fuhrmann, J.C., Wang, H., Wässle, H, Olsen, R.W. and Betz, H. (2000) The γ-aminobutyric acid type A receptor ($GABA_AR$)-associated protein GABARAP interacts with gephyrin but is not involved in receptor anchoring at the synapse. Proc. Natl. Acad Sci. USA 10, 8594-8599.

156. Haverkamp, S., Grünert, U. and Wässle, H. (2000) The cone pedicle, a complex synapse in the retina. Neuron 27, 85-95.

157. Fischer, F., Kneussel, M., Tintrup, H., Haverkamp, S., Rauen, T., Betz, H. and Wässle, H. (2000) Reduced synaptic clustering of GABA and glycine receptors in the retina of the gephyrin null mutant mouse. J. Comp. Neurol. 427, 634-648.

158. Meixner, A., Haverkamp, S., Wässle, H., Fuhrer, S., Thalhammer, J., Kropf, N., Bittner R.E., Lassmann, H., Wiche, G. and Propst, F. (2000) MAP1B is required for axon guidance and is involved in the development of the central and peripheral nervous system. J. Cell Biol. 151, 1169-1178.

159 Wässle H. (2000) Orbituary: Brian B. Boycott, December 10, 1924 - April 22, 2000. Vis. Neurosci. 17, 657-658.

160. Vitanova, L., Kupenova, P., Haverkamp, S., Popova, E., Mitova, L. and Wässle H. (2001) Immunocytochemical and electrophysiological characterization of GABA receptors in the frog and turtle retina. Vision Res. 41, 691-704.

161. Haverkamp, S., Grünert, U. and Wässle, H. (2001) The synaptic architecture of AMPA receptors at the cone pedicle of the primate retina. J. Neurosci. 21, 2488-2500.

162. Flores-Herr, N., Protti, D.A. and Wässle H. (2001) Synaptic currents generating the inhibitory surround of ganglion cells in the mammalian retina. J. Neurosci. 21, 4852-4863..

163. Frech, M.J., Pérez-León, J., Wässle, H. and Backus K.H. (2001) Characterization of the spontaneous synaptic activity of amacrine cells in the mouse retina. J. Neurophysiol. 86, 1632-1643.

164. Wässle, H. (2001) Preview: Knock out of direction selectivity in the retina. Neuron 30, 644-646.

165. Haverkamp, S., Grünert, U. and Wässle, H. (2001) Localization of kainate receptors at the cone pedicles of the primate retina. J. Comp. Neurol. 436, 471-486.

166. Ghosh, K.K., Haverkamp, S. and Wässle, H. (2001) Glutamate receptors in the rod pathway of the mammalian retina. J. Neurosci. 21, 8636-8647.

167. Cueva, J.G., Haverkamp, S., Reimer, R.J., Edwards, R., Wässle, H. and Brecha N.C. (2002) Vesicular γ-aminobutyric acid transporter expression in amacrine and horizontal cells. J. Comp. Neurol. 445, 227-237.

168. Grünert, U., Haverkamp, S., Fletcher, E.L. and Wässle, H. (2002) Synaptic distribution of ionotropic glutamate receptors in the inner plexiform layer of the primate retina. J. Comp. Neurol. 447, 138-151.

169. Wässle, H. (2002) Die Netzhaut, ein Gehirn im Auge. LEOPOLDINA (R.3) 47, 493-506.

170. Wässle, H. (2002) Brian Blundel Boycott. Biogr. Mems. Fell. R. Soc. Lond. 48, 51-68.

171. Haverkamp, S., Ghosh, K.K., Hirano A.A. and Wässle, H. (2003) Immunocytochemical description of five bipolar cell types of the mouse retina. J. Comp. Neurol 455, 463-476.

172. Wässle, H., Haverkamp, S. Grünert, U. and Morgans, C.W. (2003) The cone pedicle, the first synapse in the retina. In: The Neural Basis of Early Vision. A. Kaneko (Ed.), Springer Verlag Tokyo, pp. 19-38.

173. Pérez-León, J., Frech M.J., Schröder, J.E., Fischer, F., Kneussel, M., Wässle, H. and Backus, K.H. (2003) Spontaneous synaptic activity in an organotypic culture of the mouse retina. Invest. Ophthalmol. Vis. Sci. 44, 1376-1387.

174. Habermann, C.J., O'Brien, B.J., Wässle, H. and Protti, D.A. (2003) AII amacrine cells express L-type calcium channels at their output synapses. J. Neurosci. 23, 6904-6913.

175. Haverkamp, S., Müller, U., Harvey, K., Harvey, R.J., Betz, H. and Wässle, H. (2003) Diversity of glycine receptors in the mouse retina: Localization of the α3 subunit. J. Comp. Neurol. 465, 524-539.

176. Haverkamp, S. and Wässle, H. (2004) Characterization of an amacrine cell type of the mammalian retina immunoreactive of the vesicular glutamate transporter vGluT3. J. Comp. Neurol. 468, 251-263.

177. Ghosh, K.K., Bujan, S., Haverkamp, S., Feigenspan, A. and Wässle, H. (2004) Types of bipolar cells of the mouse retina. J. Comp. Neurol. 469, 70-82.

178. Harvey, R.J., Depner, U.B., Wässle, H., Ahmadi, S., Heindl, C., Reinold, H., Smart, T.G., Harvey, K., Schütz, B., Abo-Salem, O.M., Zimmer, A., Poisbeau,P., Welzl, H., Wolfer, D.P., Betz, H., Zeilhofer, H.U. and Müller U. (2004) GlyR α3: an essential target for spinal PGE_2-mediated inflammatory pain sensitization. Science 304, 884-887.

179. Vitanova, L., Haverkamp, S, and Wässle, H. (2004) Immunocytochemical localization of glycine and glycine receptors in the retina of the frog Rana ridibunda. Cell Tiss. Res. 317, 227-235.

180. Haverkamp, S., Müller, U., Zeilhofer, H.U., Harvey, R.J., Wässle, H. (2004) Diversity of glycine receptors in the mouse retina: Localization of the α2 subunit. J. Comp. Neurol. 477, 399-411.

181. Wässle, H. (2004) Parallel processing in the mammalian retina. Nat. Rev. Neurosci. 5, 747-757.

182. Kalloniatis, M, Sun. D., Foster, L., Haverkamp, S., and Wässle, H. (2004) Localization of NMDA receptor subunits and mapping NMDA drive within the mammalian retina. Vis. Neurosci. 21, 587-597.

183. Haverkamp, S., Wässle, H., Duebel, J., Kuner, T., Augustine, G.J., Feng, G. and Euler, T. (2005) The primordial, blue-cone color system of the mouse retina. J. Neurosci. 25, 5438-5445.

184. Protti, D.A., Flores-Herr, N., Li, W., Massey, S.C. and Wässle, H. (2005) Light signaling in scotopic conditions in the rabbit, mouse and rat retina: a physiological and anatomical study. J. Neurophysiol. 93, 3479-3488.

185. Ivanova, E., Müller, U. and Wässle, H. (2006) Characterization of the glycinergic input to bipolar cells of the mouse retina. Eur. J. Neurosci. 23, 350-364.

186. Dumitrescu, O.N., Protti, D.A., Majumdar, S., Zeilhofer, H.U. and Wässle, H. (2006) Ionotropic glutamate receptors of amacrine cells of the mouse retina. Vis. Neurosci. 23, 79-90.

187. Wässle, H., Regus-Leidig, H. and Haverkamp, S. (2006) Expression of the vesicular glutamate transporter vGluT2 in a subset of cones of the mouse retina. J. Comp. Neurol. 496, 544-555.

188. Heinze, L., Harvey, R.J., Haverkamp, S. and Wässle, H. (2007) Diversity of glycine receptors in the mouse retina: localization of the α4 subunit. J. Comp. Neurol. 500, 693-707.

189. Frazao, R., Nogueira, M.I. and Wässle, H. (2007) Colocalization of synaptic $GABA_C$-receptors with $GABA_A$-receptors and glycine-receptors in the rodent central nervous system. Cell Tissue Res. 330, 1-15.

190. Majumdar, S., Heinze, L., Haverkamp, S., Ivanova, E. and Wässle, H. (2007) Glycine receptors of A-type ganglion cells of the mouse retina. Vis. Neurosci. 24, 471-487.

191 Wässle, H. (2007) Das Auge- Fenster zum Gehirn. In: G. Schrenk (Edt.) Pattern Project: Ornament - Spiegel subatomarer Welten?, Gertrud Schrenk, Wishbone Mannheim, pp. 105-113.

192. Weiss, J., O'Sullivan, G.A., Heinze, L., Chen H.-X. and Wässle, H. (2008) Glycinergic input of small-field amacrine cells in the retinas of wildtype and glycine receptor deficient mice. Mol. Cell. Neurosci. 37, 40-55.

193. Wässle, H. (2008) Decomposing a Cone's Output (Parallel Processing). In: Masland R.H., Albright, T. (Eds.) The Senses: A Comprehensive Reference, Vol. I Vision I, Elsevier, Amsterdam, pp. 313-340.

194. Haverkamp, S., Specht, D., Majumdar, S., Zaidi, N.F., Brandstätter, J.H., Wasco, W., Wässle, H. and tom Dieck, S. (2008) Type 4 OFF cone bipolar cells of the mouse retina express calsenilin and contact cones as well as rods. J. Comp. Neurol. 507, 1087-1101.

195. Majumdar, S., Wässle, H., Jusuf, P.R. and Haverkamp, S. (2008) Mirror-symmetrical populations of wide-field amacrine cells of the macaque monkey retina. J. Comp. Neurol. 508, 13-27.

196. Wässle, H., Puller, C., Müller, F. and Haverkamp, S. (2009) Cone contacts, mosaics and territories of bipolar cells in the mouse retina. J. Neurosci. 29, 106-117.

197. Haverkamp, S., Inta, D., Monyer, H. and Wässle, H. (2009) Expression analysis of green fluorescent protein in retinal neurons of four transgenic mouse lines. Neuroscience 21, 126-139.

198. van Wyk, M., Taylor, W.R. and Wässle, H. (2009) Receptive-field properties of ON- and OFF- ganglion cells in the mouse retina. Vis. Neurosci. 26, 293-308.

199. Majumdar, S., Weiss, J. and Wässle, H. (2009) Glycinergic input of widefield, displaced amacrine cells of the mouse retina. J. Physiol. 587.15, 3831-3849.

200. Wässle, H., Heinze, L., Ivanova, E., Majumdar, S., Weiss, J., Harvey, R.J. and Haverkamp, S. (2009) Glycinergic transmission in the mammalian retina. Front. Mol. Neurosci. 2009; 2: 6 Epub 2009 Jul 9.

201. Thyagarajan S., van Wyk, M., Lehmann, K., Löwel, S., Feng, G. and Wässle, H. (2010) Visual function in mice with photoreceptor degeneration and transgenic expression of channelrhodopsin 2 in ganglion cells. J. Neurosci. 30, 8745-8758.