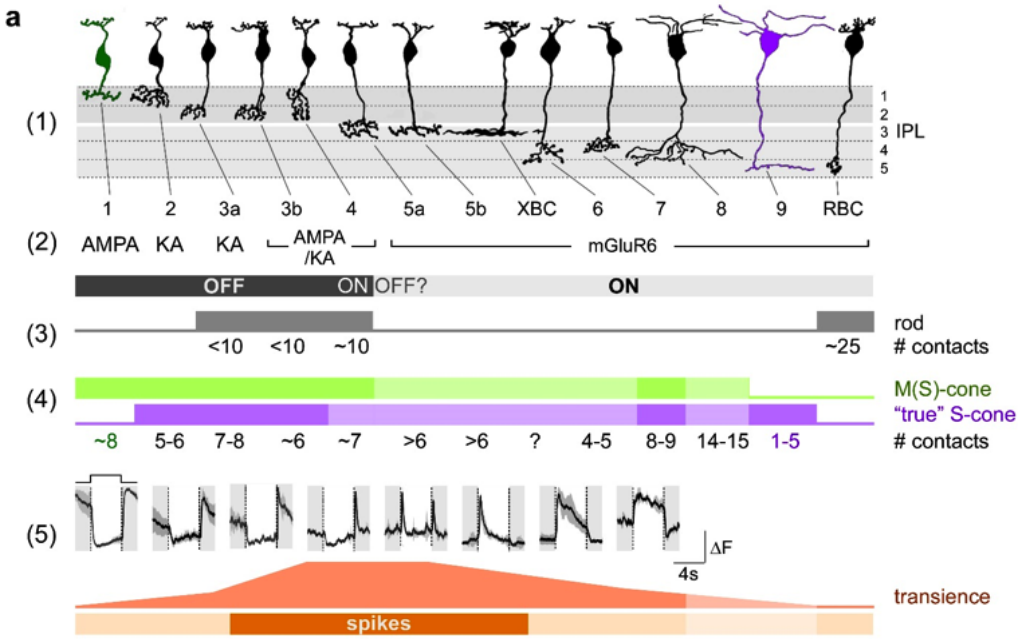
In format provided by Euler *et al.* (AUGUST 2014)



b

		1	2	3a	3b	4	5a	5b	XBC	6	7	8	9	RBC	
antibodies	NK3R	++	++												
	Syt2		++							+					t6 terminals
	recoverin		++												
	HCN4			++											
	PKARIIß				++										
	Calsenilin					++									
	SCGN		+	+		+	+			+		(+)			
	CaBP5			++			++							++	both t5a/b?
	PKCα													++	
transgenics	MitoP	++		(+)		(+)									
	CLM12		++												
	5-HTR2a				(+)	++								(+)	
	5-HTR3a						++								
	Igfbp5								+?						
	Grm6						+	+	+?	+	+	+		+	
	GUS8.4										++			(+)	
	Pcp2		+							+				++	t2 and/or t6
	CLM1	(+)									(+)	(+)	++		

c

mouse	1	2	3a	3b	4	5a	5b	XBC	6	7	8	9	RBC
rabbit	CBa 1/1w	CBa 1-2	CBa 2	CBa 2n	CBa 1-2n	CBb 3n	CBb 3		CBb 3-4	CBb 4	CBb 5	wide-field	
gr. squirrel	cb1a/b	cb3b	cb2			cb5a	cb5b		cb6a/b	cb7b	cb7a	BB	
macaque	DB1	FMB	DB3a	DB3b	DB2	DB4		"giant"	IMB	DB5	DB6	BB	

Supplemental Fig. S1 – Organization of the bipolar cell types in the mouse retina.

a | Morphologies of the 12 types of cone bipolar cell (BC) and the rod bipolar cell (RBC), arranged according to their inner plexiform layer (IPL) stratification level (1). This panel is from[1] (© (2004) Wiley), is adapted with permission from[2] (Society for Neuroscience), is adapted with permission from[3] (Nature Publishing Group), and modified according to NK3R antibody stainings[4]. (2) Cells are grouped into ON and OFF cells depending on the polarity of their light response and their dendritic glutamate receptor (AMPA-type; KA, kainate receptor-type; mGluR6, metabotropic glutamate receptor 6)[5, 6]. In the IPL centre, an ON/OFF type may exist[7, 8]. (3,4) Contacts to rod9-11 and cone photoreceptors[1, 4, 12]. Mice possess short (S, "blue") and medium (M, "green") wavelength-sensitive cones, with many M-cones co-expressing S-opsin[13]. Dimed bar colour indicates likely but not yet experimentally confirmed connectivity. (5) Calcium response to a light step recorded in cone BC terminals[7]. The response profiles illustrate temporal differences ("transience") between BCs with terminals towards the IPL boarders (sustained) compared to those closer to the IPL centre (transient). b | BC markers, either antibodies or transgenic lines expressing fluorescent protein; for references see Supplemental Table S1 (labelling: ++, strong; +, weak; (+) very weak or unclear; rightmost column: t stands for 'type'). c | Homologous BC types in different mammals.

(ΔF, change in Ca2+ indicator fluorescence; NK3R, neurokinin 3 receptor; Syt2, synaptotagmin II; HCN4, hyperpolarization-activated cyclic nucleotide-gated K+ channel; PKARIIβ, protein kinase A regulatory subunit II beta; SCGN, secretagogin; CaBP5, Ca2+-binding protein 5; PKCα, protein kinase C alpha)

1. Ghosh, K.K., Bujan, S., Haverkamp, S., Feigenspan, A. & Wässle, H. Types of bipolar cells in the mouse retina. J Comp Neurol 469, 70-82 (2004).
2. Wässle, H., Puller, C., Müller, F. & Haverkamp, S. Cone contacts, mosaics, and territories of bipolar cells in the mouse retina. J Neurosci 29, 106-17 (2009).

3. Helmstaedter, M. et al. Connectomic reconstruction of the inner plexiform layer in the mouse retina. Nature 500, 168-74 (2013).
4. Breuninger, T., Puller, C., Haverkamp, S. & Euler, T. Chromatic bipolar cell pathways in the mouse retina. J Neurosci 31, 6504-17 (2011).
5. Puller, C., Ivanova, E., Euler, T., Haverkamp, S. & Schubert, T. OFF bipolar cells express distinct types of dendritic glutamate receptors in the mouse retina. Neuroscience 243, 136-48 (2013).
6. Masu, M. et al. Specific deficit of the ON response in visual transmission by targeted disruption of the mGluR6 gene. Cell 80, 757-765 (1995).
7. Baden, T., Berens, P., Bethge, M. & Euler, T. Spikes in mammalian bipolar cells support temporal layering of the inner retina. Curr Biol 23, 48-52 (2013).
8. Euler, T. & Masland, R.H. Light-evoked responses of bipolar cells in a mammalian retina. J Neurophysiol 83, 1817-29 (2000).
9. Mataruga, A., Kremmer, E. & Müller, F. Type 3a and type 3b OFF cone bipolar cells provide for the alternative rod pathway in the mouse retina. J Comp Neurol 502, 1123-37 (2007).
10. Fyk-Kolodziej, B., Qin, P. & Pourcho, R.G. Identification of a cone bipolar cell in cat retina which has input from both rod and cone photoreceptors. J Comp Neurol 464, 104-13 (2003).
11. Tsukamoto, Y. & Omi, N. Functional allocation of synaptic contacts in microcircuits from rods via rod bipolar to AII amacrine cells in the mouse retina. J Comp Neurol 521, 3541-55 (2013).
12. Dunn, F.A. & Wong, R.O. Diverse strategies engaged in establishing stereotypic wiring patterns among neurons sharing a common input at the visual system's first synapse. J Neurosci 32, 10306-17 (2012).
13. Roehlich, P., Van Veen, T. & Szél, A. Two different visual pigments in one retinal cone cell. Neuron 13, 1159-1166 (1994).