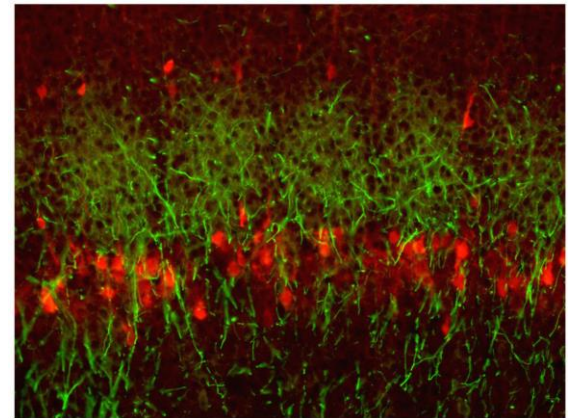
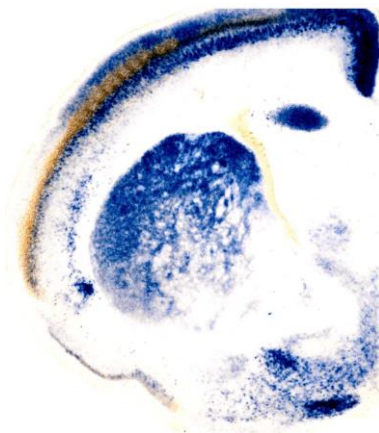
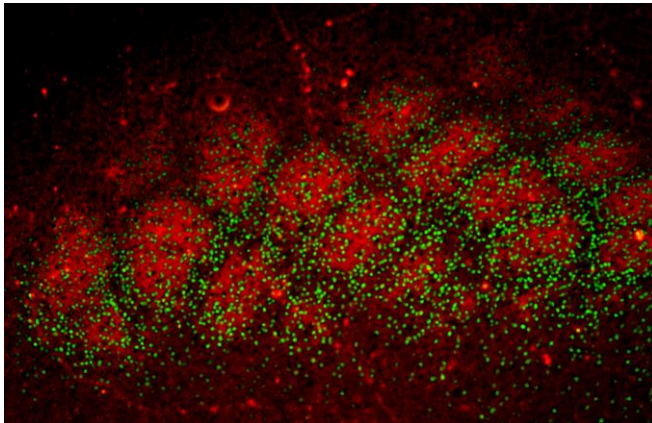
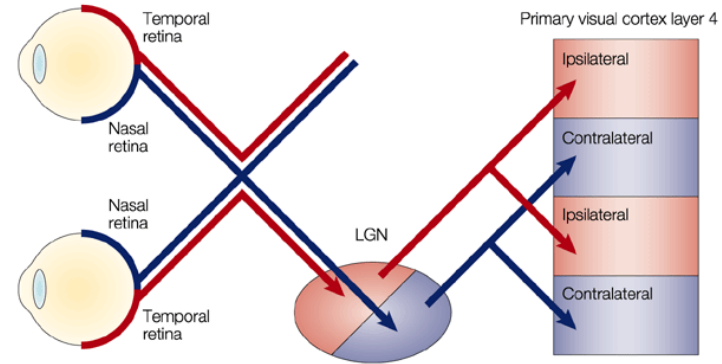
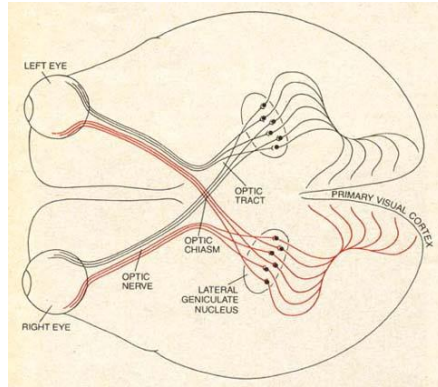


Early life experience and brain development

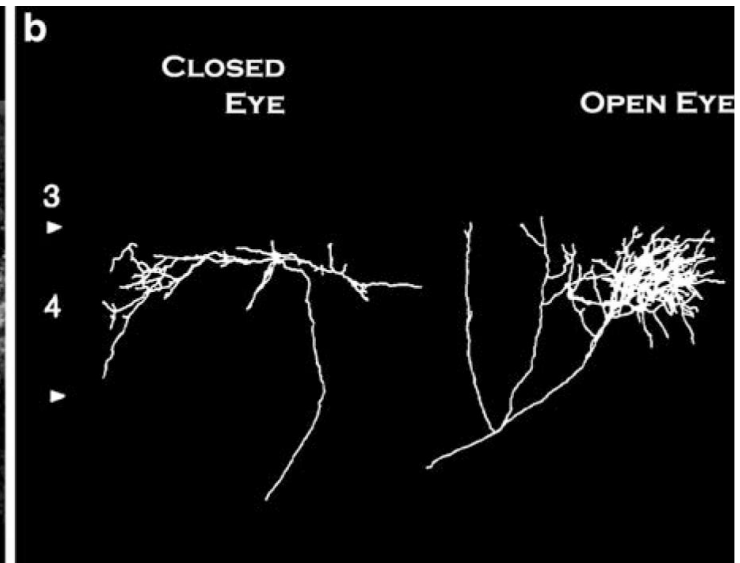
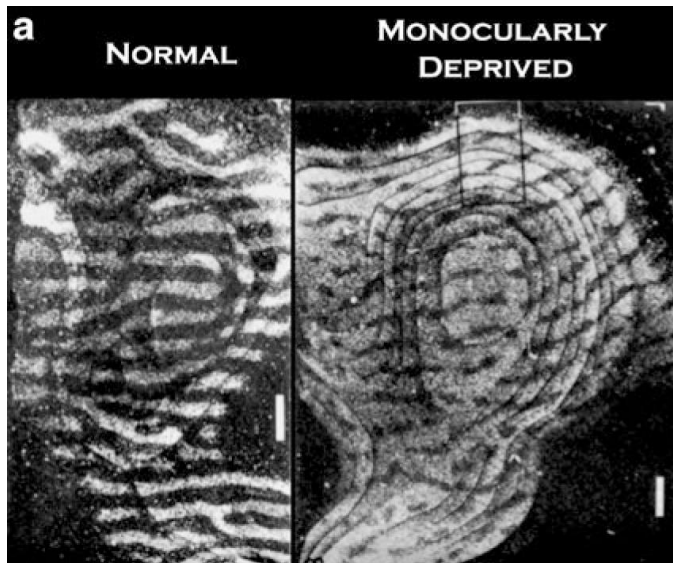


RIKEN BSI
Laboratory for Molecular Mechanisms of
Thalamus Development
Tomomi Shimogori

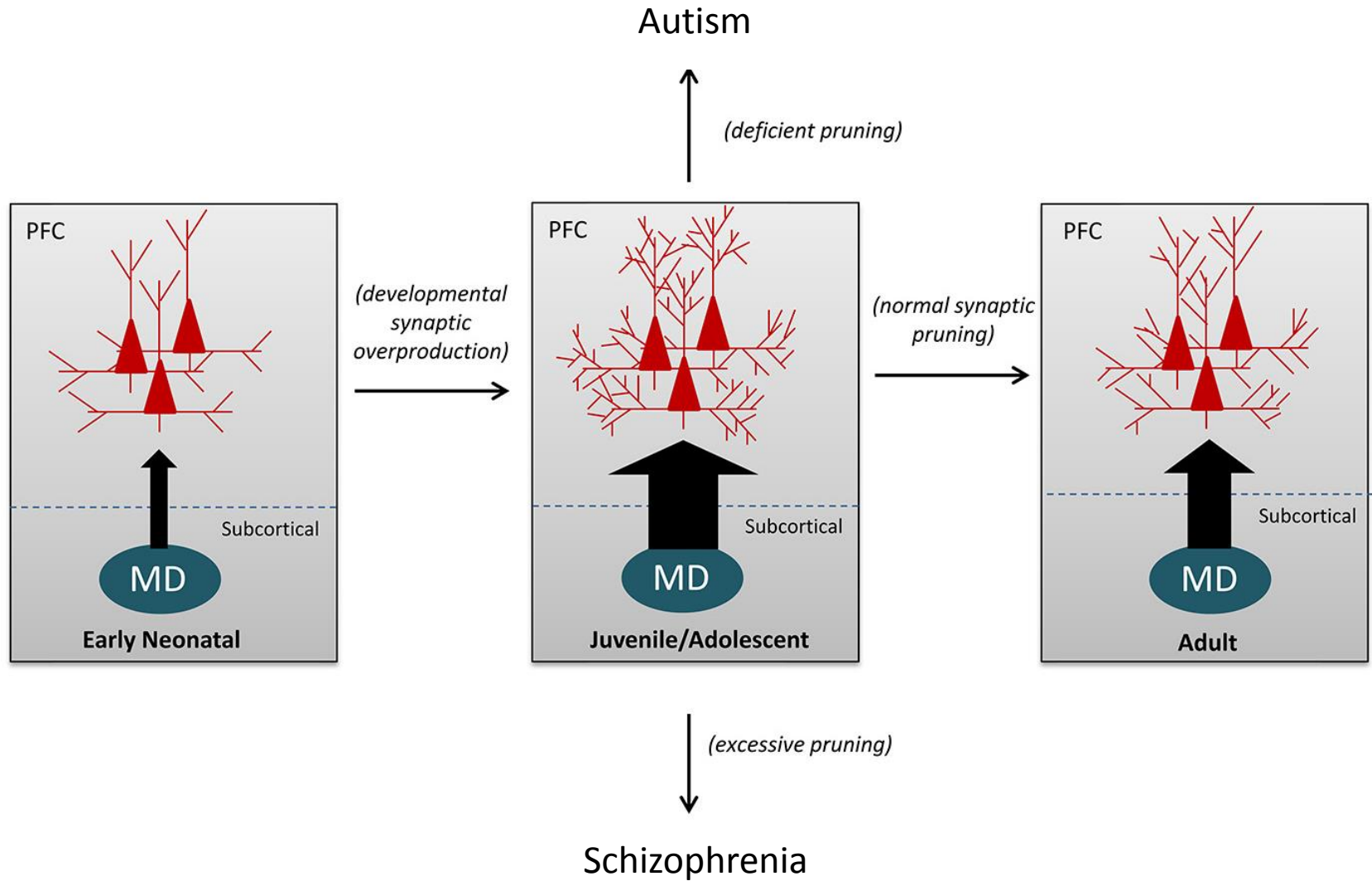
Experience in early life shapes circuit structure



Nature Reviews | Neuroscience



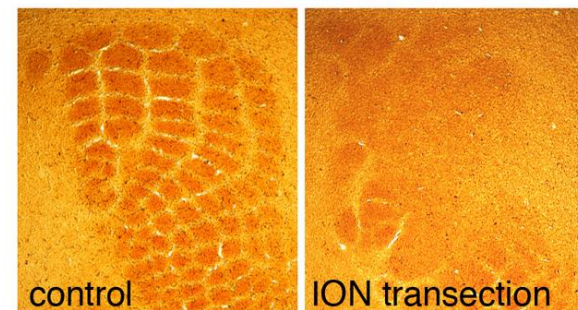
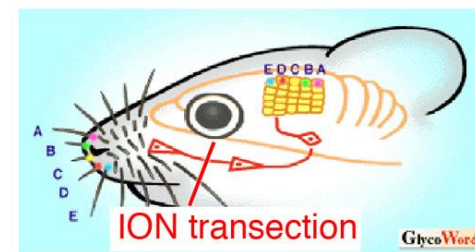
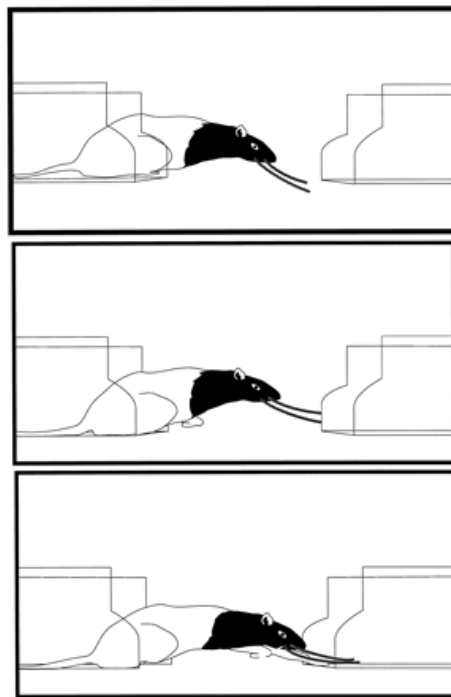
Dendrite development of PFC neurons and mental disorders



Whisker input shapes neuronal morphology and circuit

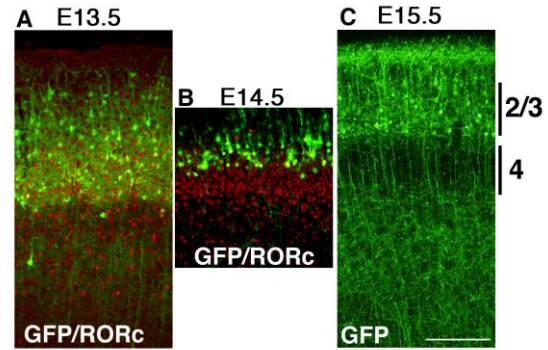
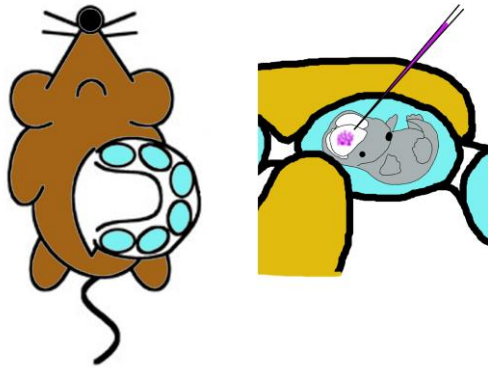


Rodent gap crossing test

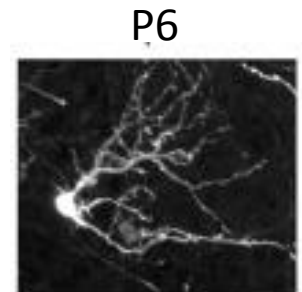
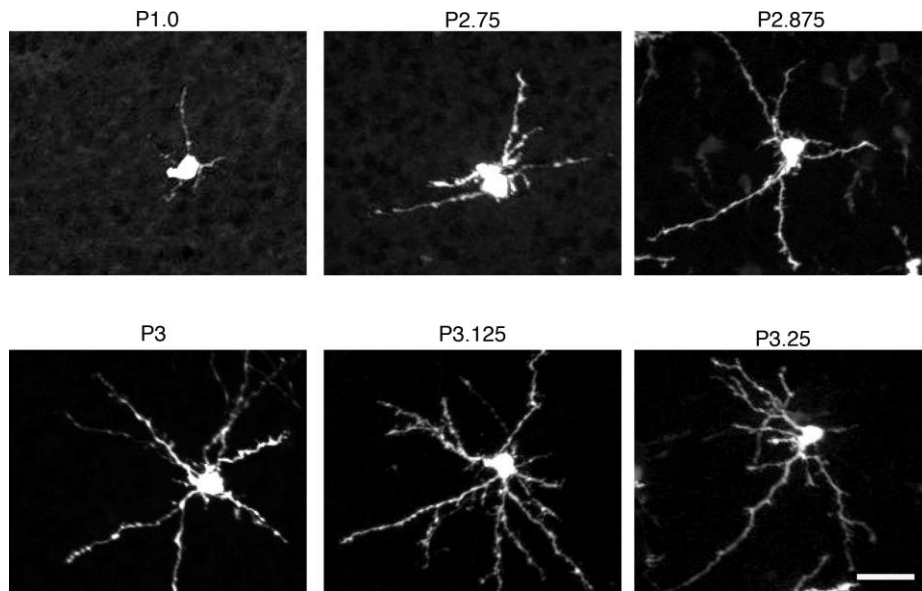


Elimination of excess dendrite during first postnatal week

IUE (*In utero* electroporation)

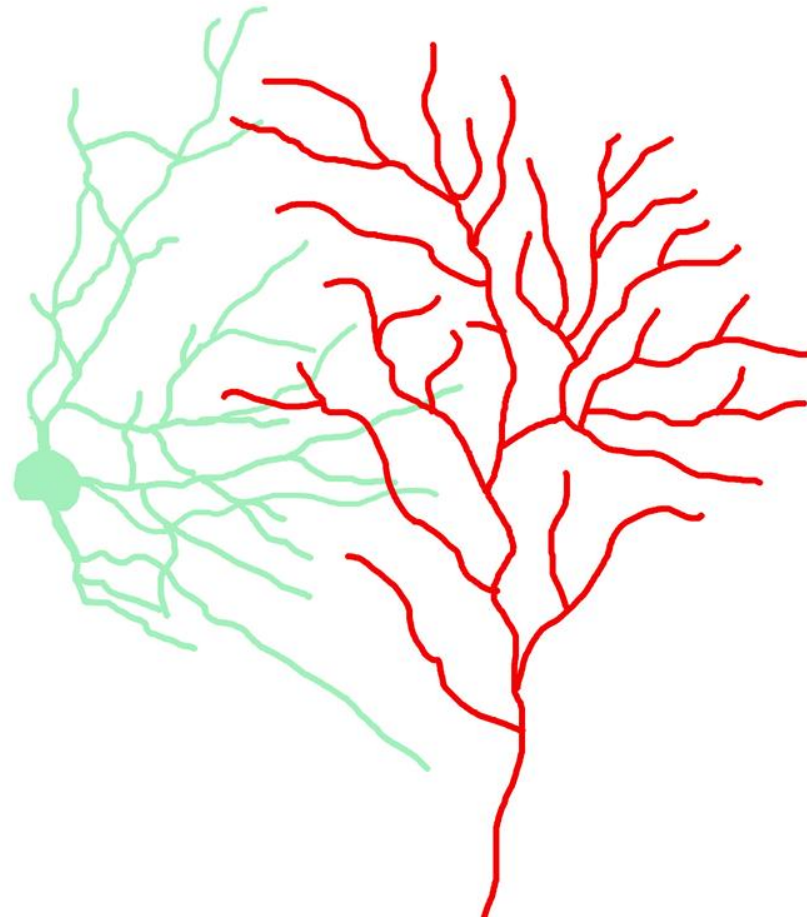


Matsui et al., JoVE 2011

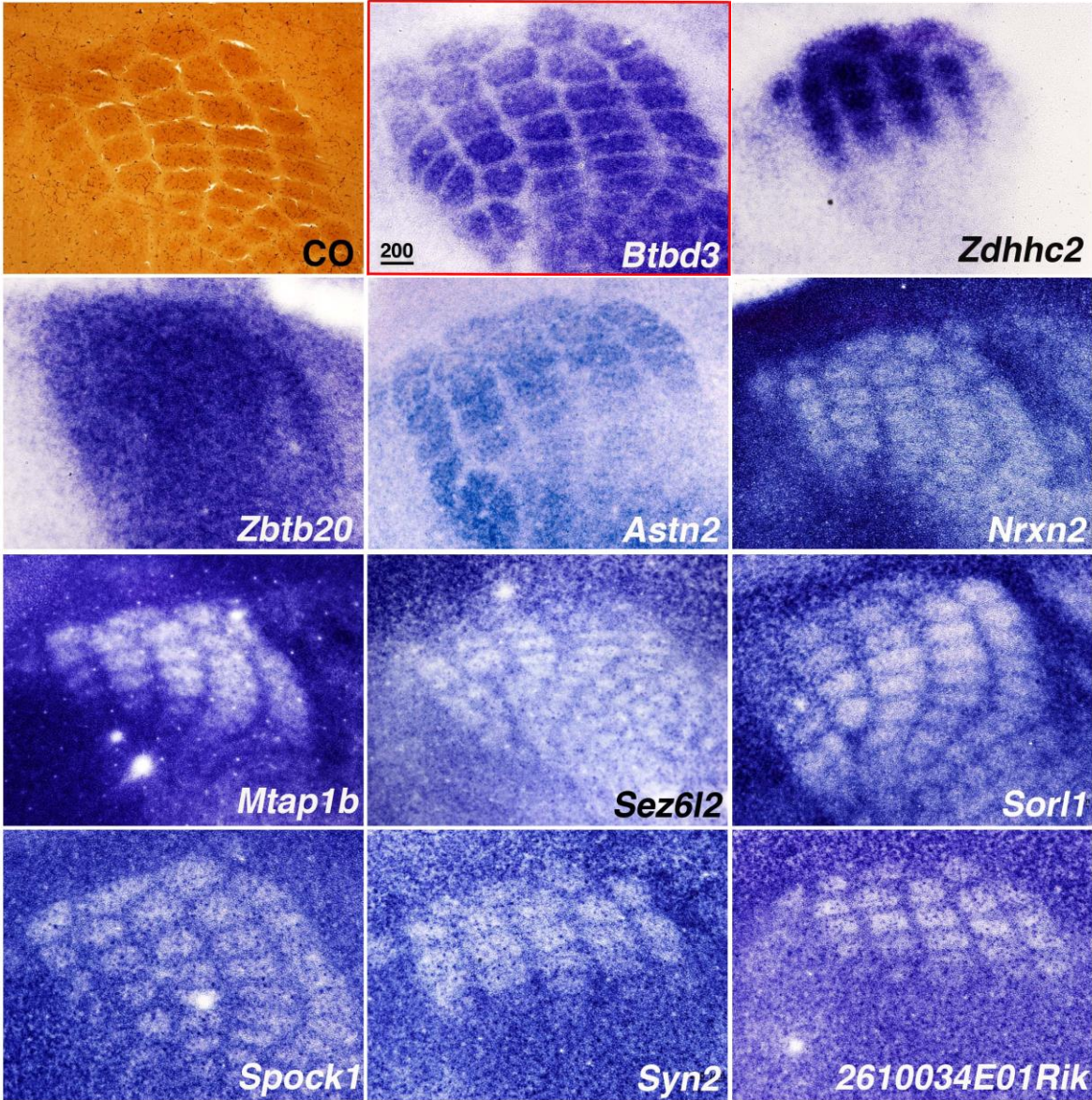


Asuka Matsui and Paven Aujla

Time course of spiny stellate neuron dendrite development

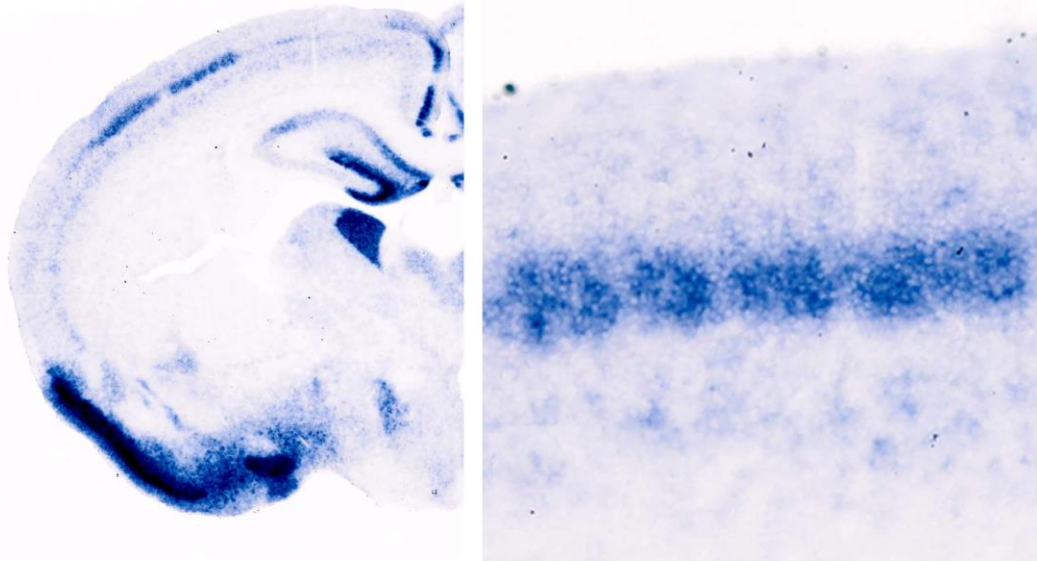


Genes expressed in the developing barrel cortex



May Tran

BTB/POZ (broad complex Tramtrack bric-a-brac/Pox virus and zinc finger) domain



Btd3; BTB (POZ) domain containing 3

The BTB/POZ domain mediates homomeric dimerisation and in some instances heteromeric dimerisation. The structure of the dimerised PLZF BTB/POZ domain has been solved and consists of a tightly intertwined homodimer. POZ domains from several zinc finger proteins have been shown to mediate transcriptional repression.

Neuron, Vol. 43, 823–834, September 16, 2004, Copyright ©2004 by Cell Press

BTB/POZ-Zinc Finger Protein Abrupt Suppresses Dendritic Branching in a Neuronal Subtype-Specific and Dosage-Dependent Manner

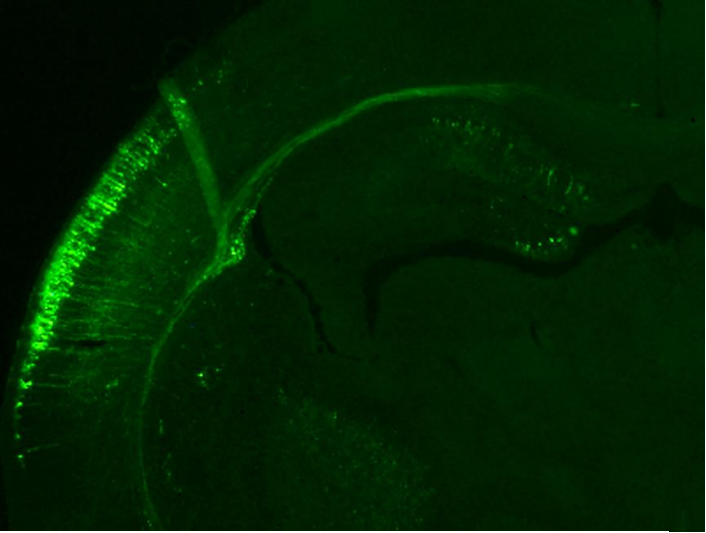
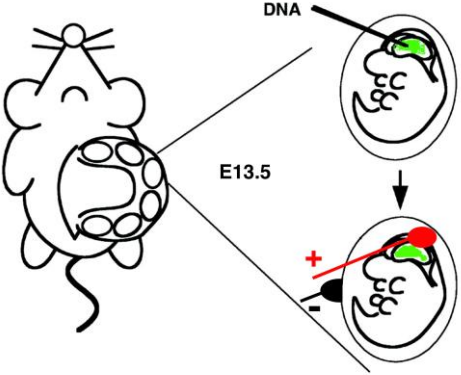
Wenjun Li,^{1,2,3} Fay Wang,^{1,2,3}
Laurent Menut,¹ and Fen-Biao Gao^{1,2,3,*}
¹Gladstone Institute of Neurological Disease
²Program in Neuroscience
³Department of Neurology
University of California, San Francisco
San Francisco, California 94141

Neuron, Vol. 43, 809–822, September 16, 2004, Copyright ©2004 by Cell Press

Development of Morphological Diversity of Dendrites in *Drosophila* by the BTB-Zinc Finger Protein Abrupt

Kaoru Sugimura,^{1,2} Daisuke Satoh,^{1,2} Patricia Estes,^{3,5} Stephen Crews,³
and Tadashi Uemura^{1,4,6,*}
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Chapel Hill, North Carolina 27599
³Core Research for Evolutional Science
and Technology (CREST)
Japan Science and Technology
Kawaguchi, Saitama 332-0012
Japan

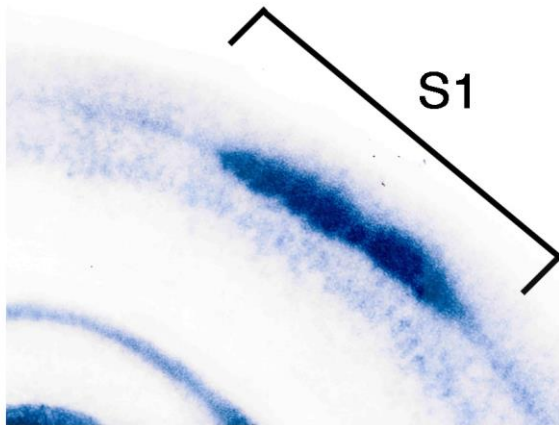
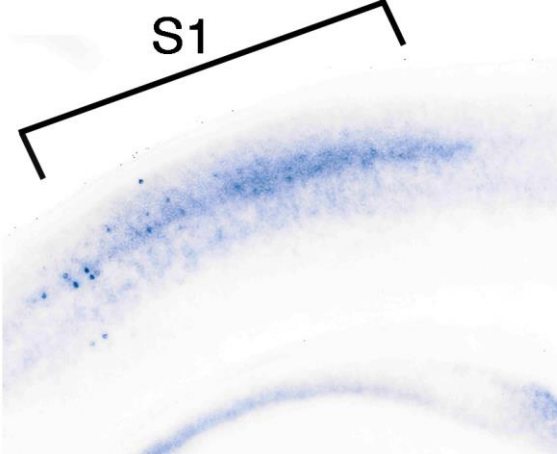
Btbd3 knock down in cortical layer 4 neuron by *in utero* electroporation



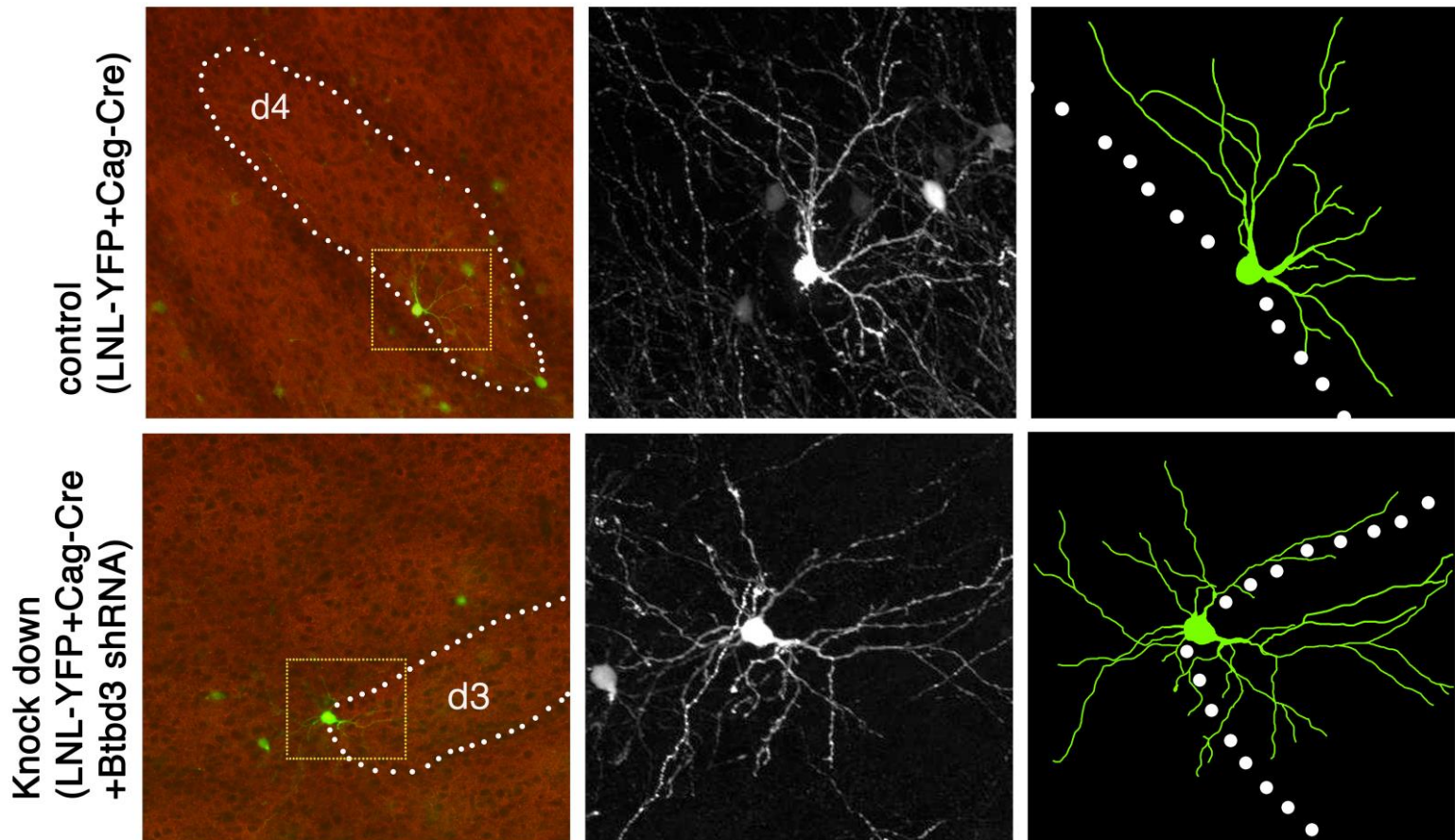
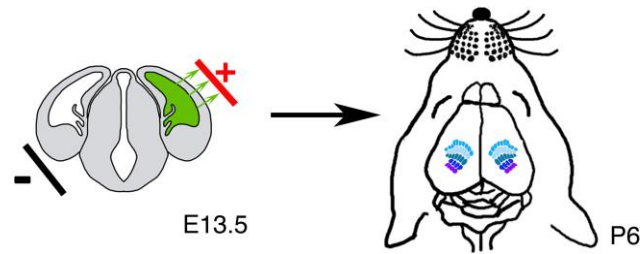
Btbd3 shRNA ep

control

Approx 70% ↓

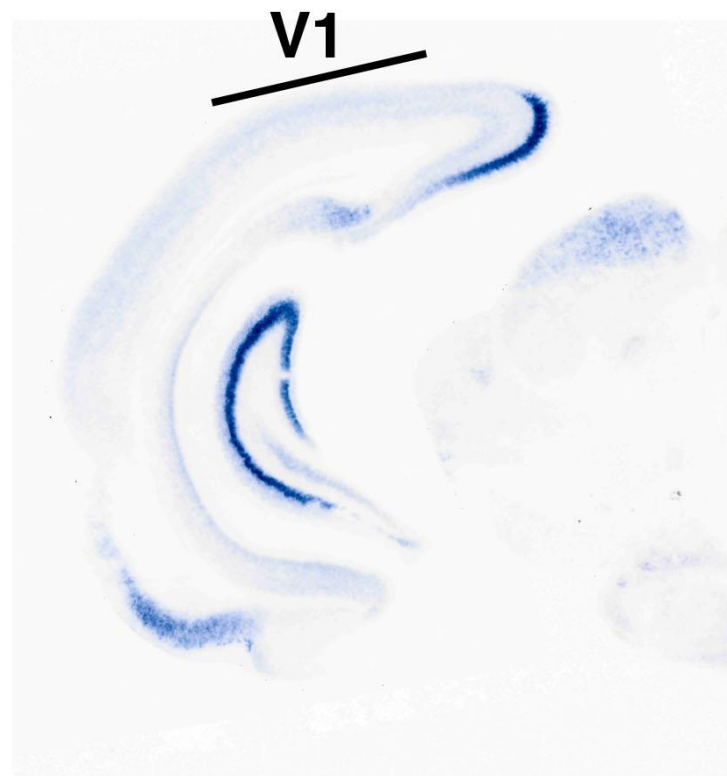
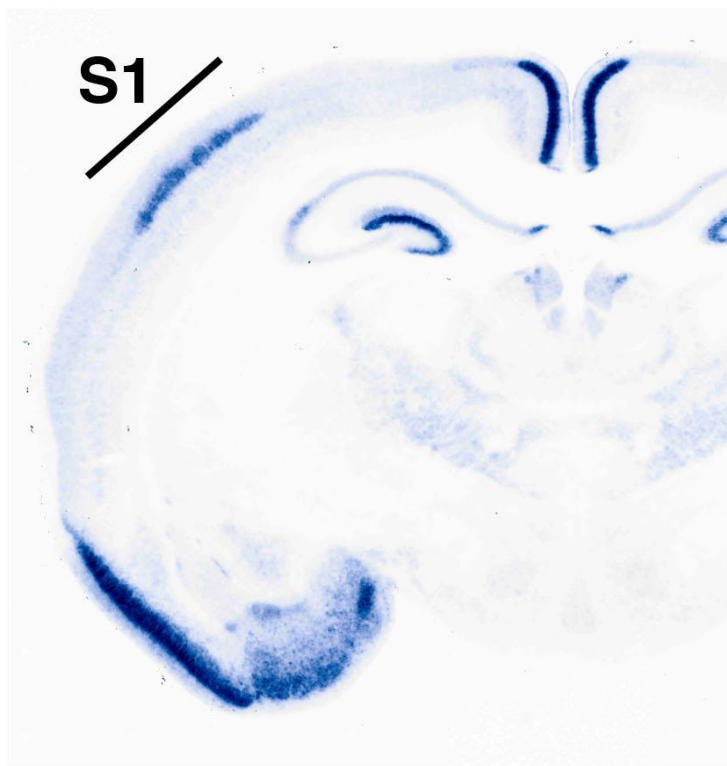


Btbd3 controls number of spiny stellate primary dendrite



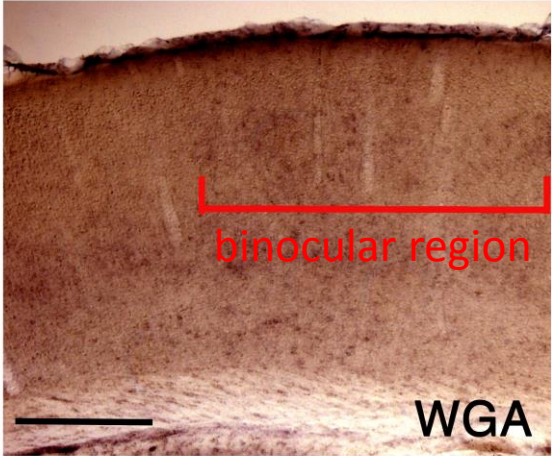
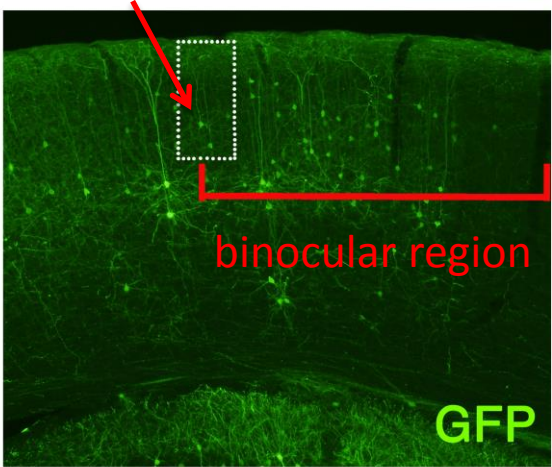
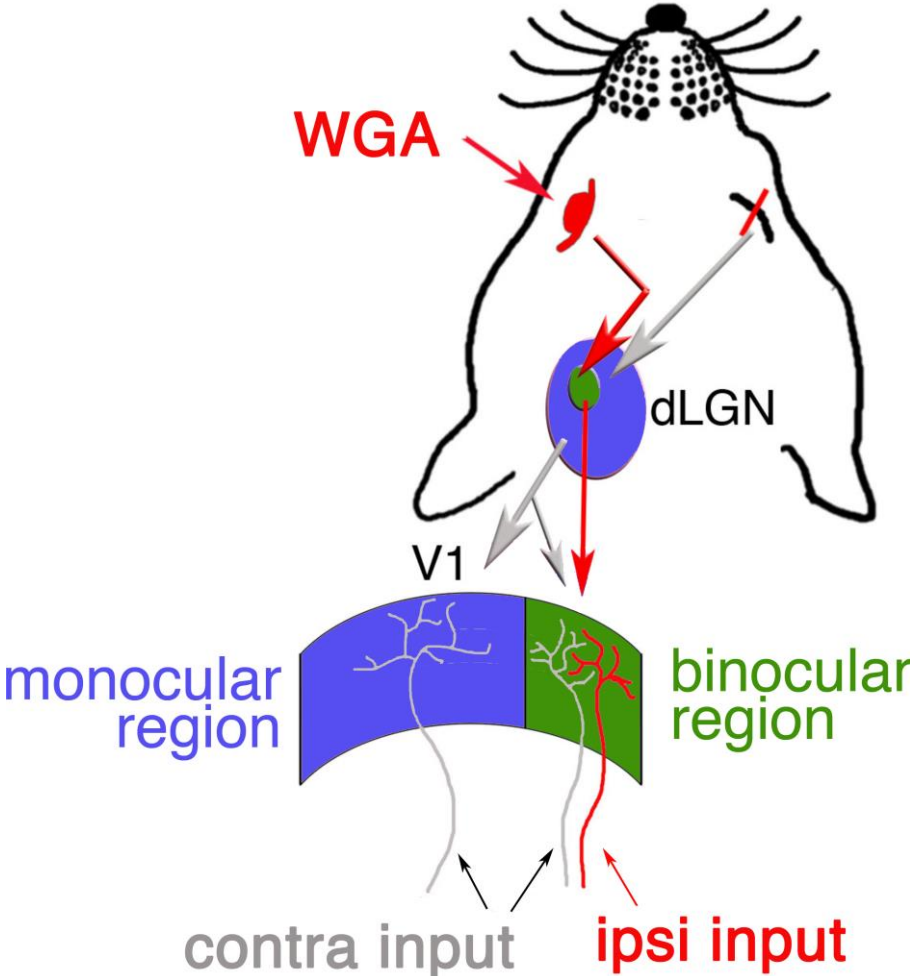
Btbd3 is sufficient for activity dependent dendrite patterning?

mouse

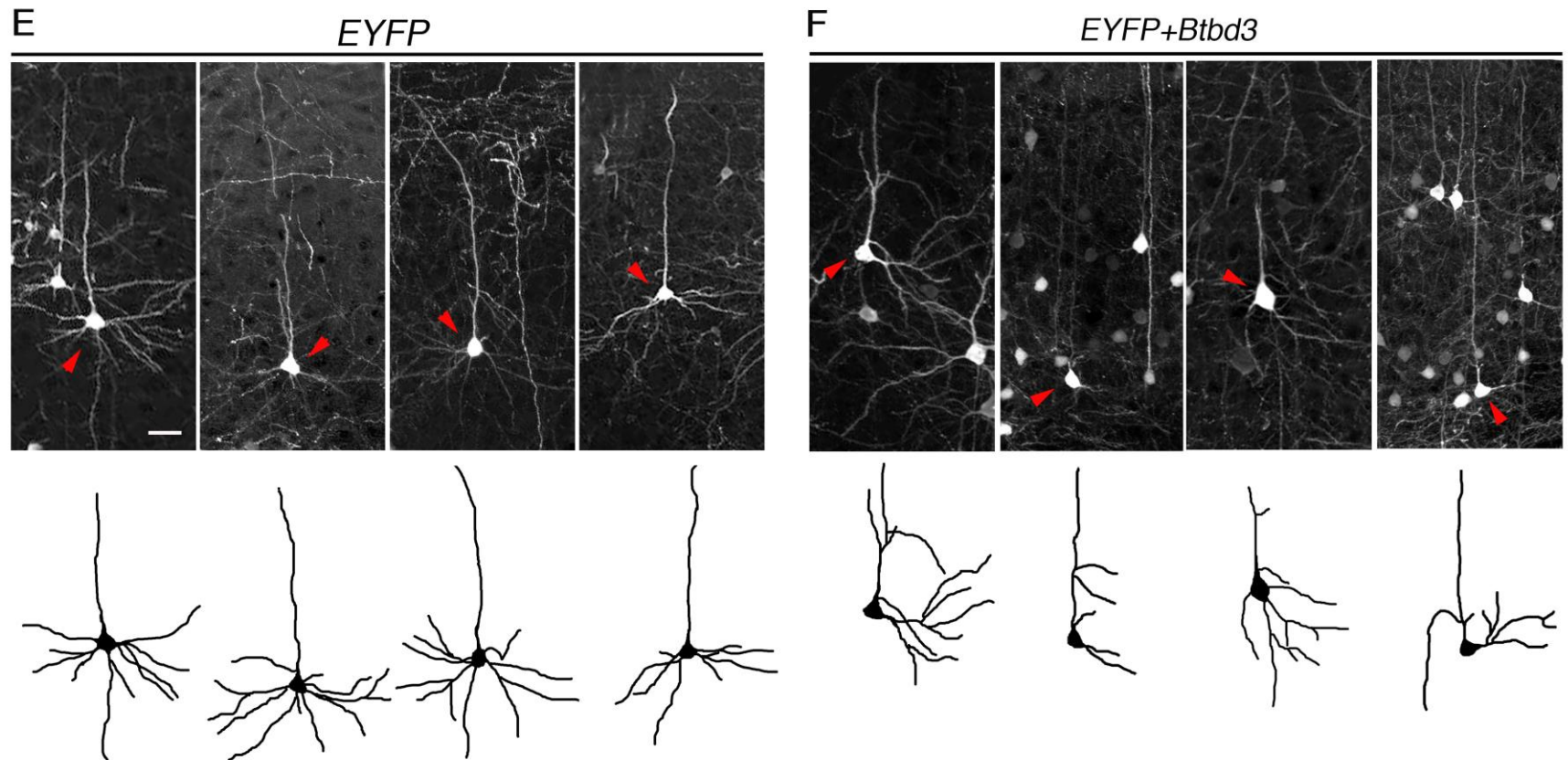
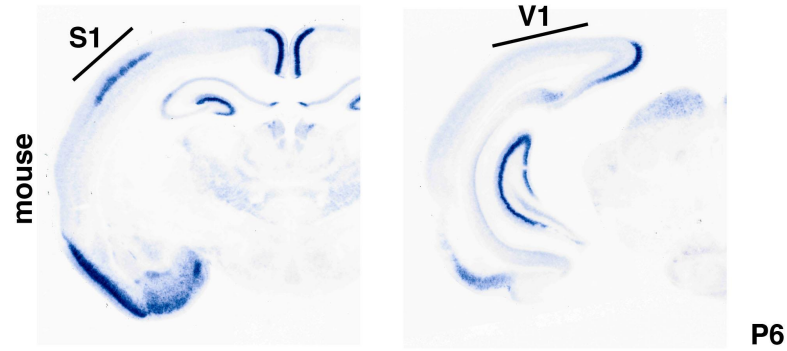


P6

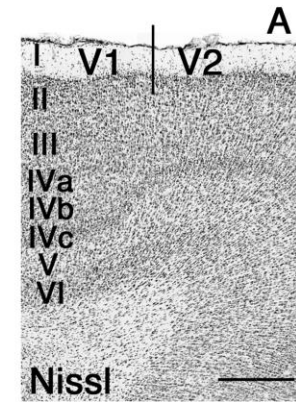
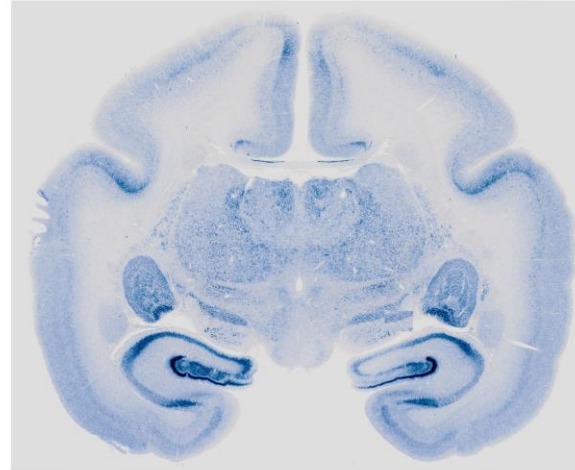
Ectopic expression of Btbd3 in mouse binocular region



Btbd3 expression promote dendrite morphology change



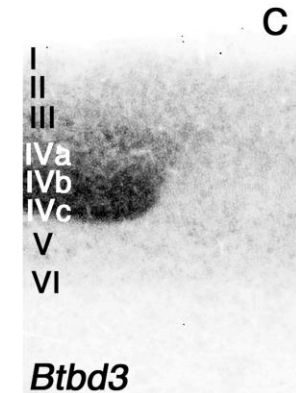
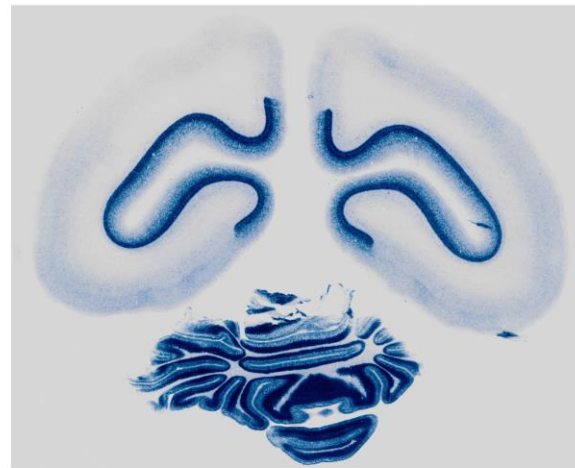
Expression of Btbd3 in neonate common marmoset brain



The Journal of Neuroscience



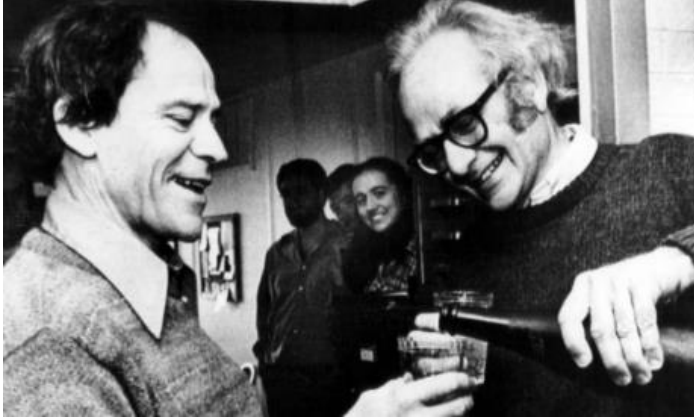
- Neuronal Angiogenin Causes Astrocytic Wt1
- LRK Limits Stem-Cell Proliferation after Stroke
- Neuronal Projection from Amygdala to Thalamus Is Prone
- Dementia-Linked Presenilin Mutation Causes Abnormal Splicing



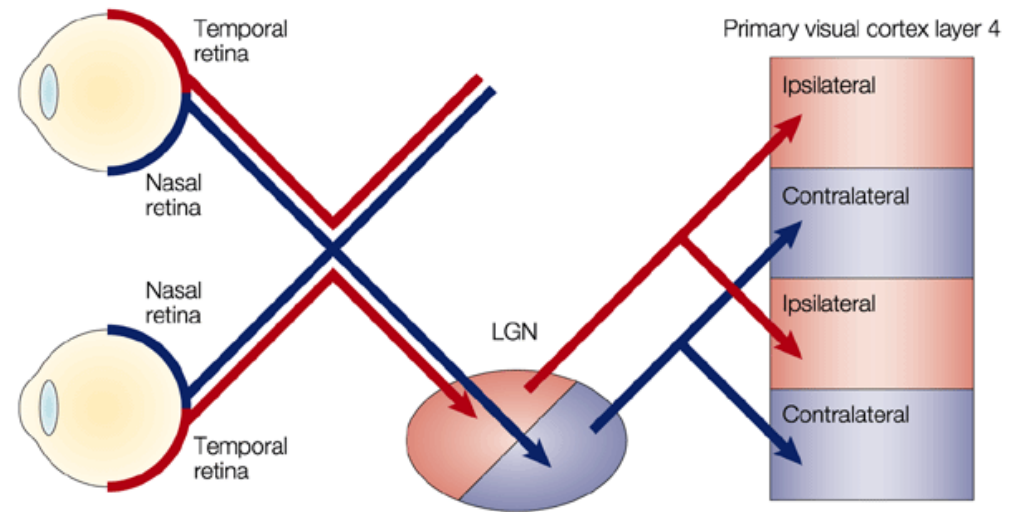
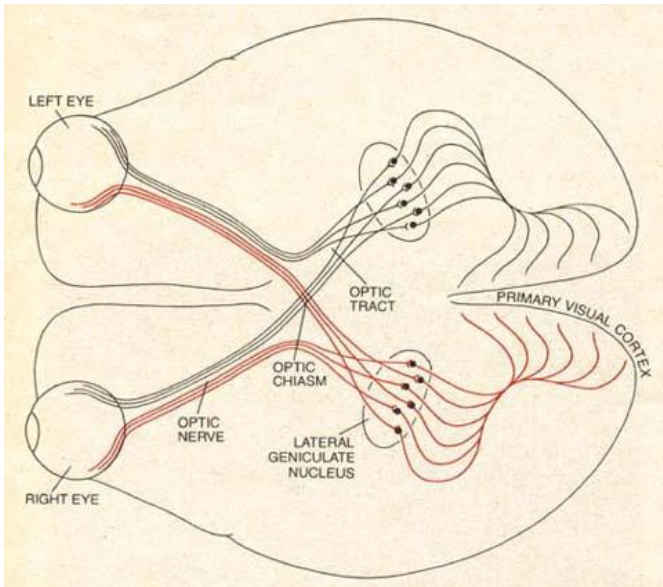
Mashiko *et al.*, (2012) *J Neurosci.*
Marmoset gene atlas

Ferret, cat, primate have ocular dominance column

but not in mouse



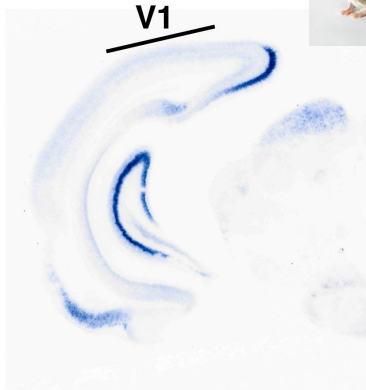
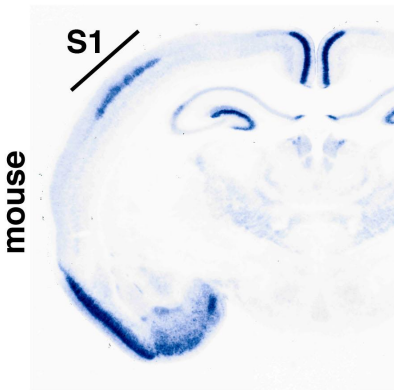
Torsten Nils Wiesel, together with David H. Hubel, he received the 1981 Nobel Prize in Physiology or Medicine, for their discoveries concerning information processing in the visual system; the prize was shared with Roger W. Sperry for his independent research on the cerebral hemispheres.



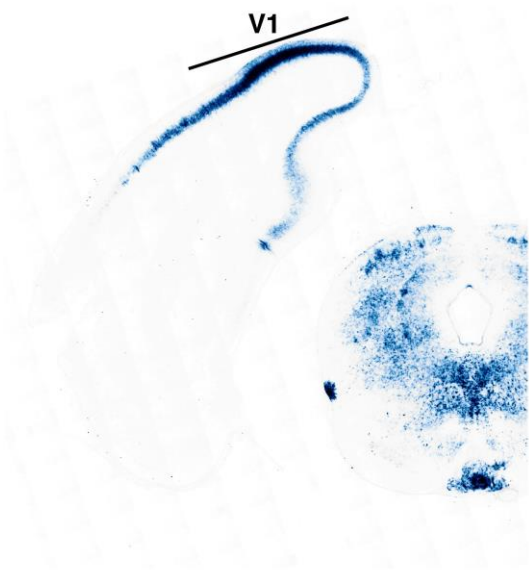
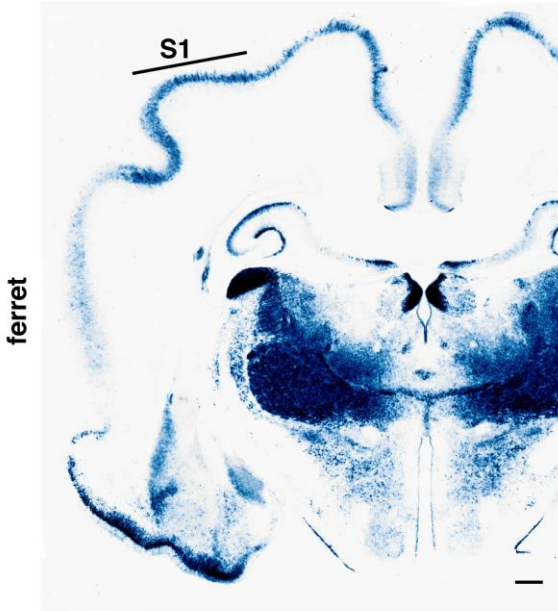
Expression of Btbd3 on mouse and ferret cortex

developmental time course

	E13.5	E15.5	P0	P6
mouse	Layer IV			
		Layer II/III		
			TCA	
ferret	E35	P0	P7	P14

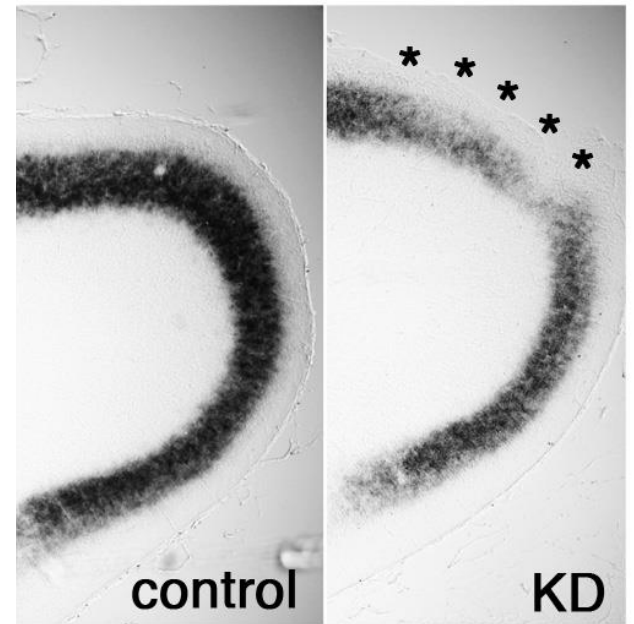
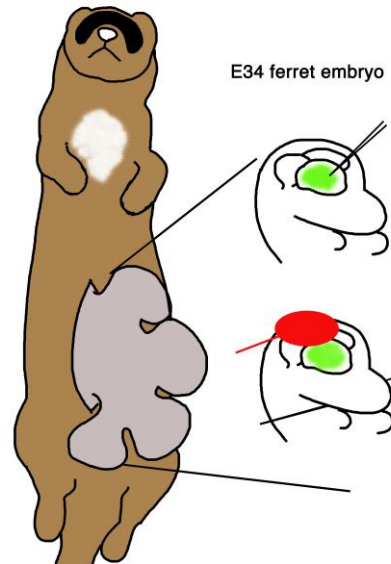
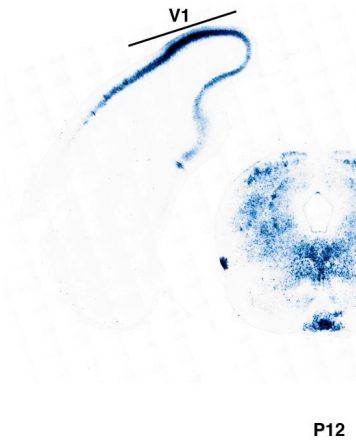
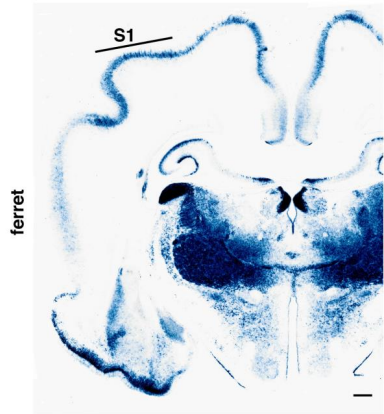


P6



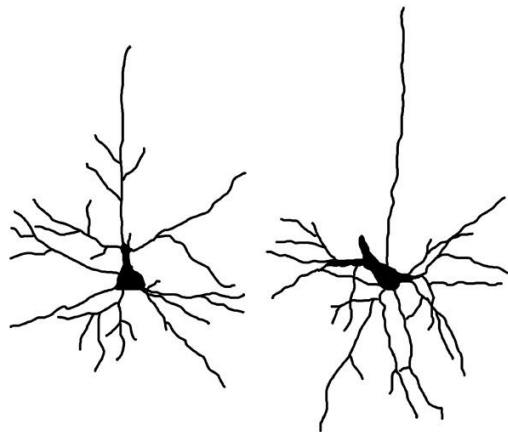
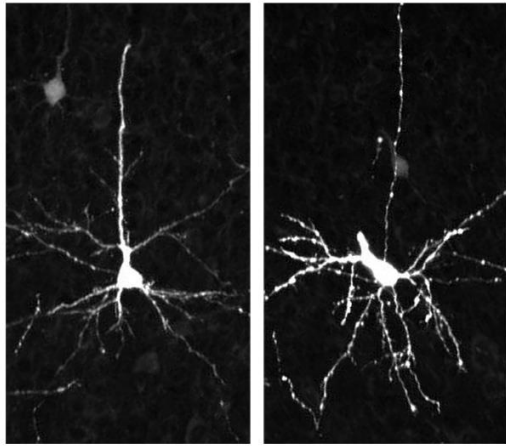
P12

Btbd3 knock down in ferret visual cortex with shRNA electroporation

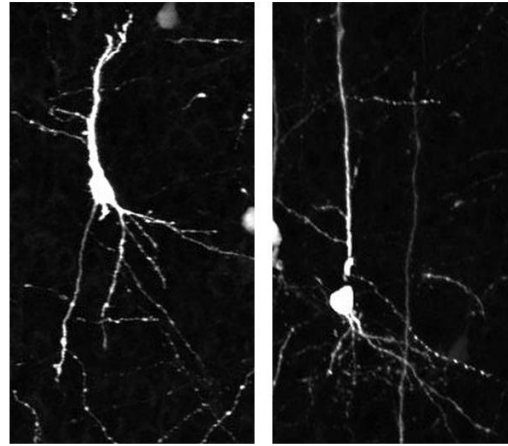


Btbd3 is indispensable for dendrite remodeling in ferret visual cortex

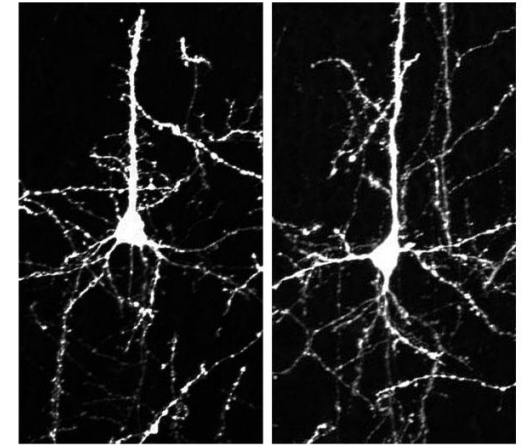
control



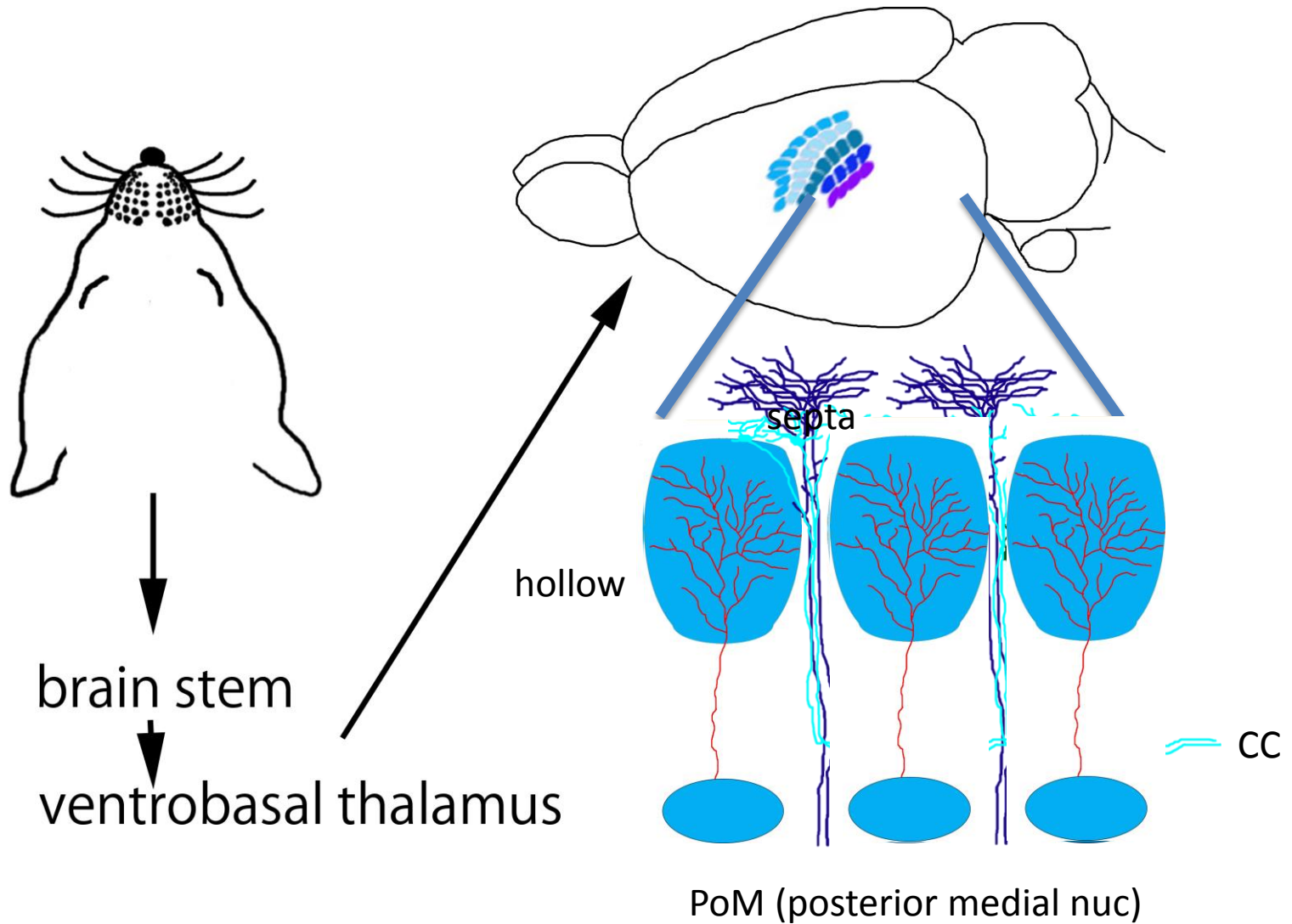
ME



Btbd3 KD + ME



Schema of Mouse somatosensory circuit



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Mouse

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Taku Iwasato

Shige Itohara

Susumu Tonegawa

Fumikazu Suto



文部科学省 “社会に貢献する脳科学”の実現を目指して
脳科学研究戦略推進プログラム
Strategic Research Program for Brain Sciences
Ministry of Education, Culture, Sports, Science and Technology - Japan



Brain/MINDS

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