

Publication

Altered map of visual space in the superior colliculus of mice lacking early retinal waves

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2250673**Author(s)** Mrsic-Flogel, Thomas D.; Hofer, Sonja B.; Creutzfeldt, Claire; Cloëz-Tayarani, Isabelle; Changeux, Jean-Pierre; Bonhoeffer, Tobias; Hübener, Mark**Author(s) at UniBasel** [Hofer, Sonja](#) ; [Mrsic-Flogel, Thomas](#) ;**Year** 2005**Title** Altered map of visual space in the superior colliculus of mice lacking early retinal waves**Journal** Journal of Neuroscience**Volume** 25**Number** 29**Pages / Article-Number** 6921-8

During the development of the mammalian retinocollicular projection, a coarse retinotopic map is set up by the graded distribution of axon guidance molecules. Subsequent refinement of the initially diffuse projection has been shown to depend on the spatially correlated firing of retinal ganglion cells. In this scheme, the abolition of patterned retinal activity is not expected to influence overall retinotopic organization, but this has not been investigated. We used optical imaging of intrinsic signals to visualize the complete retinotopic map in the superior colliculus (SC) of mice lacking early retinal waves, caused by the deletion of the beta2 subunit of the nicotinic acetylcholine receptor. As expected from previous anatomical studies in the SC of beta2(-/-) mice, regions activated by individual visual stimuli were much larger and had less sharp borders than those in wild-type mice. Importantly, however, we also found systematic distortions of the entire retinotopic map: the map of visual space was expanded anteriorly and compressed posteriorly. Thus, patterned neuronal activity in the early retina has a substantial influence on the coarse retinotopic organization of the SC.

Publisher Society for Neuroscience**ISSN/ISBN** 0270-6474 ; 1529-2401**edoc-URL** <http://edoc.unibas.ch/49612/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1523/JNEUROSCI.1555-05.2005**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/16033902>**ISI-Number** WOS:000230620700022**Document type (ISI)** Journal Article