

1. Depositor

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2. Strain Name

Tg(zfSWS1-5.5A:EGFP)^{tkd002}

3. Reference

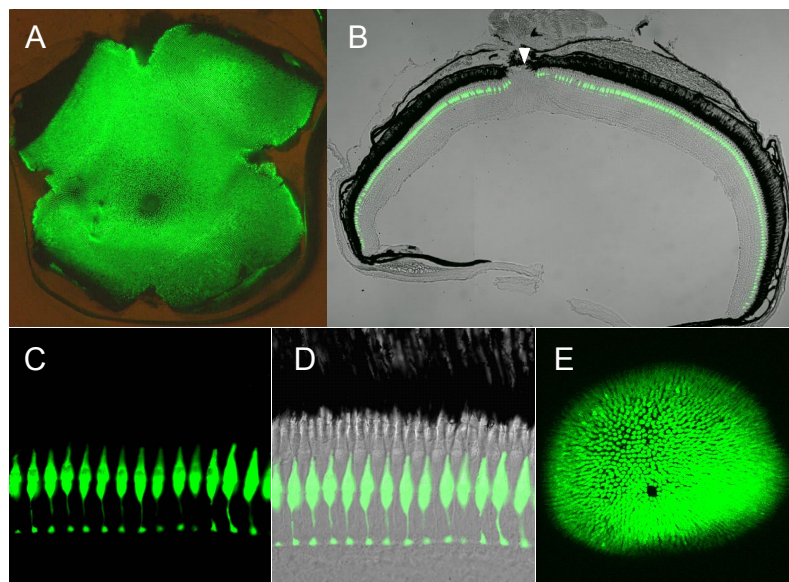
Takechi, M., Hamaoka, T. and Kawamura, S. (2003).

Fluorescence visualization of ultraviolet-sensitive cone photoreceptor development in living zebrafish.

FEBS Letters, 553 (1-2):90-94.

4. Abstract

Zebrafish have one type of rod and four types of cone photoreceptor cells in the retina. The four cone types express phylogenetically and spectrally distinct types of visual opsins. Using zebrafish as a model animal, we are exploring the molecular mechanism of the cell-type specific expression of the opsin genes. In particular, we are focusing on identifying *cis*-regulatory regions of the opsin genes. We make DNA constructs where test genomic regions in or around the opsin genes are conjugated to GFP (Green Fluorescent Protein)-related reporter genes, and introduce them to zebrafish embryos to establish transgenic lines. The Tg(zfSWS1-5.5A:EGFP)^{tkd002} is one of such transgenic zebrafish lines, where the 5.5-kb region immediately upstream of the SWS1 (UV-sensitive) opsin gene is introduced with the EGFP reporter. It expresses GFP specifically in short-single cones of the retina, where the endogenous SWS1 opsin gene is expressed, with a spatiotemporal pattern indistinguishable from that of SWS1 opsin expression. In effect, short-single cones of the fish are visualized by GFP. The fish would be useful for the studies of retinal development and screening of retinal mutants.



Visualization of short-single (UV-sensitive) cones of the retina in the transgenic zebrafish, $Tg(zfSWS1-5.5A:EGFP)^{tk002}$, by GFP fluorescence.

(A) An entire view of an adult retina flattened by dissection. Nasal is to the right and ventral is to bottom. (B) An overview of an adult eye cryosection showing GFP fluorescence overlaid on light-field image. Arrowhead indicates optic nerve exit point. (C) GFP-fluorescent image of the vertical section of the retina at higher magnification. The image is viewed under dark field with FITC filter. (D) Image in (C) overlaid on light-field image. (E) A confocal image of whole mount retina of 7 dpf (days post fertilization) larva.