

A New Transgenic Line Reporting pStat3 Signaling in Glia

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ZHAO *ET AL.*¹ REPORTED on a novel transgenic zebrafish line (*gfap:stat3-gfp*) that expresses Stat3-GFP under the control of the glial-specific *gfap* promoter. Stat3-GFP expression is restricted to Gfap-expressing cells in the developing nervous system (Fig. 1). In the adult retina, *stat3-gfp* RNA is detected in Müller glia, but Stat3-GFP protein is undetectable. Following injury, Stat3-GFP is induced in proliferating Müller glia-derived progenitors that mediate retina regeneration (Fig. 1). Stat3-GFP expression correlates with endogenous p-Stat3, and Stat3-GFP expression is suppressed by Jak/Stat3 signaling inhibitors. Wan *et al.*² used this line to identify growth factors that act through Stat3 signaling. Although the above work focused on retina, it is likely that Stat3-GFP will report Stat3 activation in Gfap-expressing cells throughout the nervous system. Thus, this transgenic line should facilitate studies of Stat3 activation and the identification of small molecules that regulate this activation.

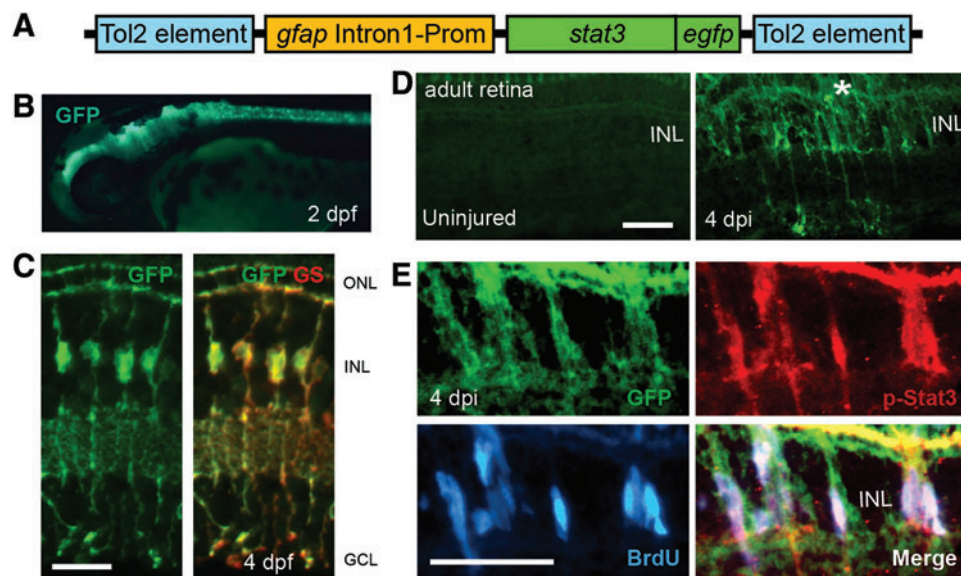


FIG. 1. Stat3-GFP expression in the developing nervous system and in the adult regenerating retina. (A) A schematic representation of the *gfap:stat3-gfp* transgene construct. (B) Stat3-GFP is expressed throughout the brain and spinal cord in live larva. (C) Expression of Stat3-GFP in glutamine synthetase (GS)-positive Müller glia at 4 days postfertilization (dpf). (D) Stat3-GFP is not detectable in uninjured adult retina but expressed in Müller glia at an injury site in the inner nuclear layer (INL) at 4 days postretinal injury (dpi). The asterisk marks the injury site. (E) Colocalization of Stat3-GFP, p-Stat3, BrdU in Müller glia-derived progenitors. Scale bar 20 μ m (C), 50 μ m (D, E). Color images available online at www.liebertpub.com/zeb

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References

1. Zhao XF, *et al.* Leptin and IL-6 family cytokines synergize to stimulate muller glia reprogramming and retina regeneration. *Cell Rep* 2014;9:272–284.
2. Wan J, Zhao XF, Vojtek A, Goldman D. Retinal injury, growth factors, and cytokines converge on beta-catenin and pStat3 signaling to stimulate retina regeneration. *Cell Rep* 2014;9:285–297.

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