

Fig.S1

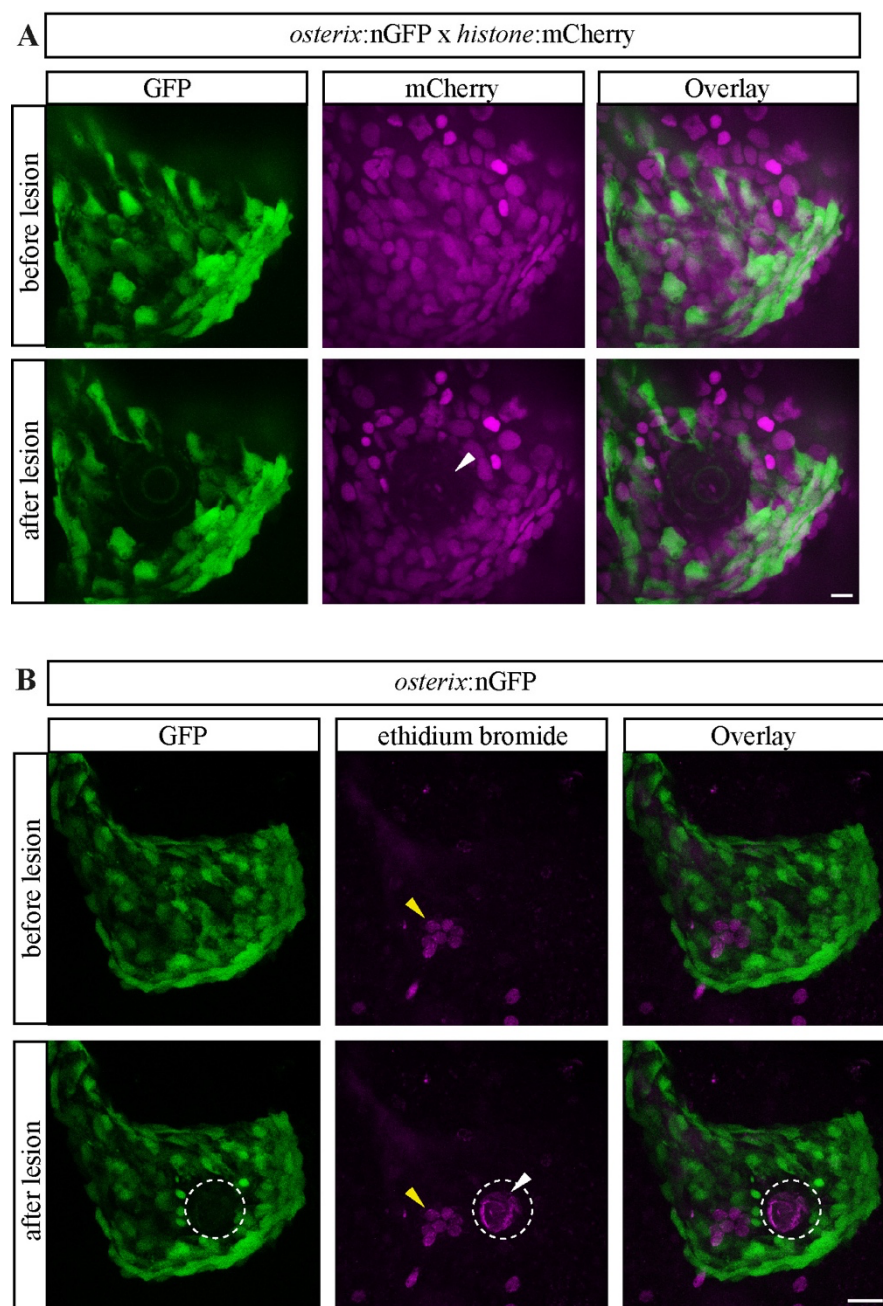


Fig. S1. A: Representative image of 6 dpf transgenic *osterix:nGFP x histone:mCherry* zebrafish before and after laser ablation. Arrowhead points at ablation area in which mCherry fluorescence is lost immediately. Scale bar 10 μ m. **B:** Representative example of a 6 dpf, ethidium bromide incubated transgenic *osterix:nGFP* zebrafish before and after laser ablation. White arrowhead points at ethidium bromide signal after ablation. Yellow arrowhead points at non-osteoblast necrotic cells already present before lesion. Scale bar 20 μ m.

Fig. S2

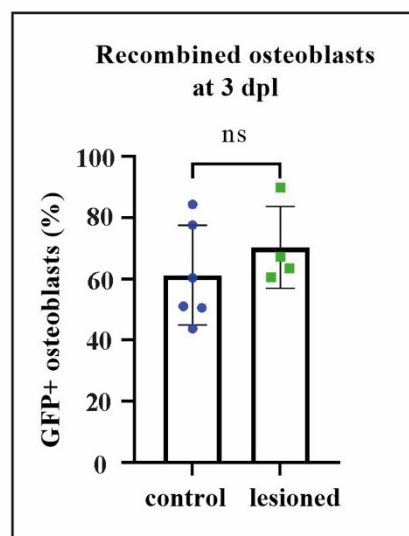


Fig. S2. Quantification of experiment shown in Fig. 2F. Mean + s.d. Unpaired two-tailed *t*-test with Welch's correction: $p=0.3678$. $n = 4-6$.

Fig. S3

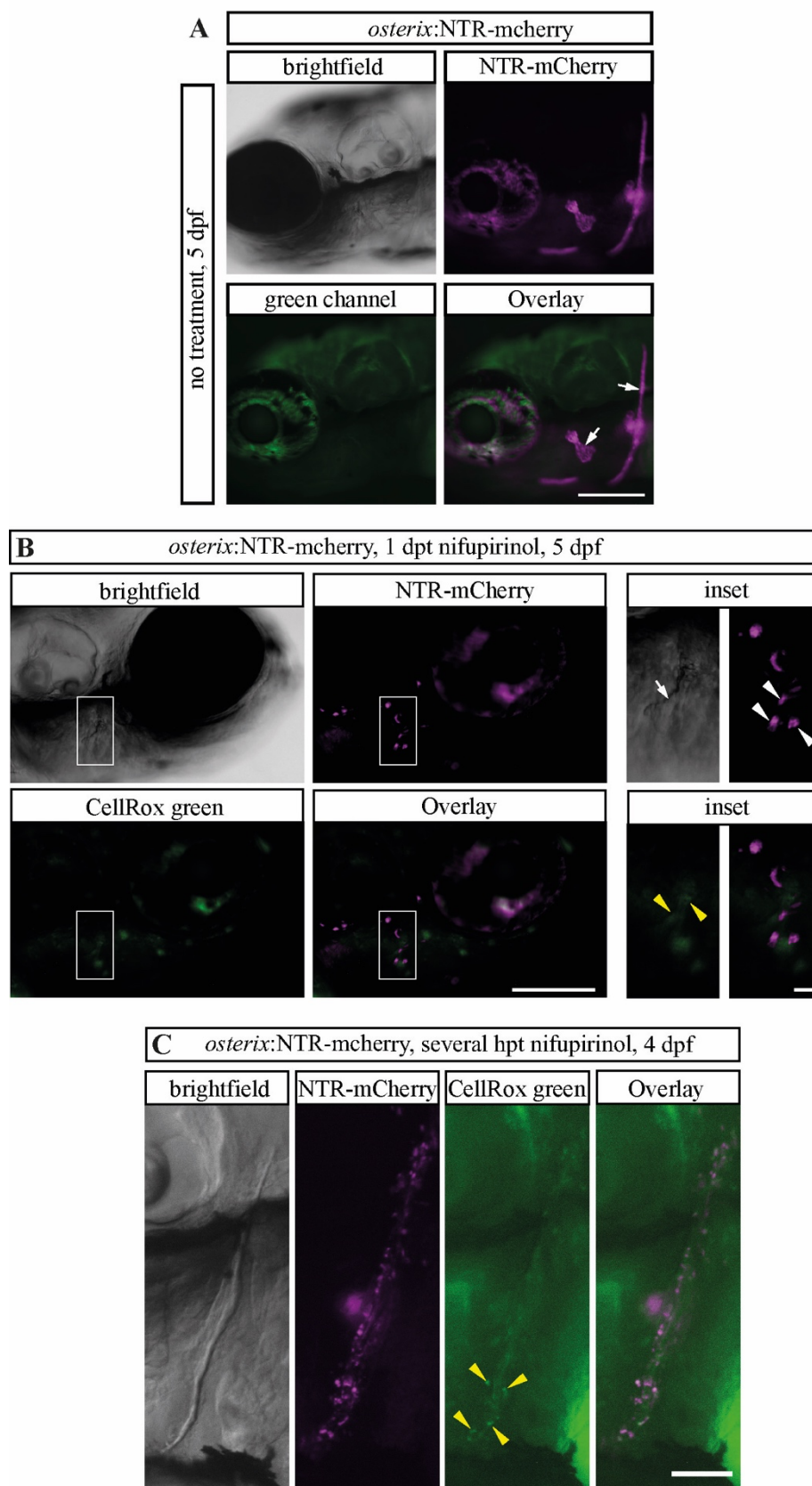


Fig. S3. A: 5 dpf *osterix:NTR-mCherry* zebrafish without nifupirinol (NFP) treatment, i.e. without induction of ablation, in the red and green channel. Arrows point at intact opercle and cleithrum, respectively. Scale bar 200 μ m. **B:** 5 dpf, CellRox green incubated *osterix:NTR-mCherry* zebrafish after 1 day of NFP treatment. Only few cells are left in the opercle area. Arrow, opercle in brightfield view, white arrowheads, dying osteoblasts, yellow arrowheads, CellRox green signal indicating ROS. Scale bar overview 200 μ m, scale bar inset 20 μ m. **C:** Short term, several h treatment of 4 dpf, CellRox green incubated *osterix:NTR-mCherry* zebrafish with NFP (cleithrum area). Yellow arrowheads point at CellRox green signal in a selection of dying osteoblasts. Scale bar 50 μ m.

Fig. S4

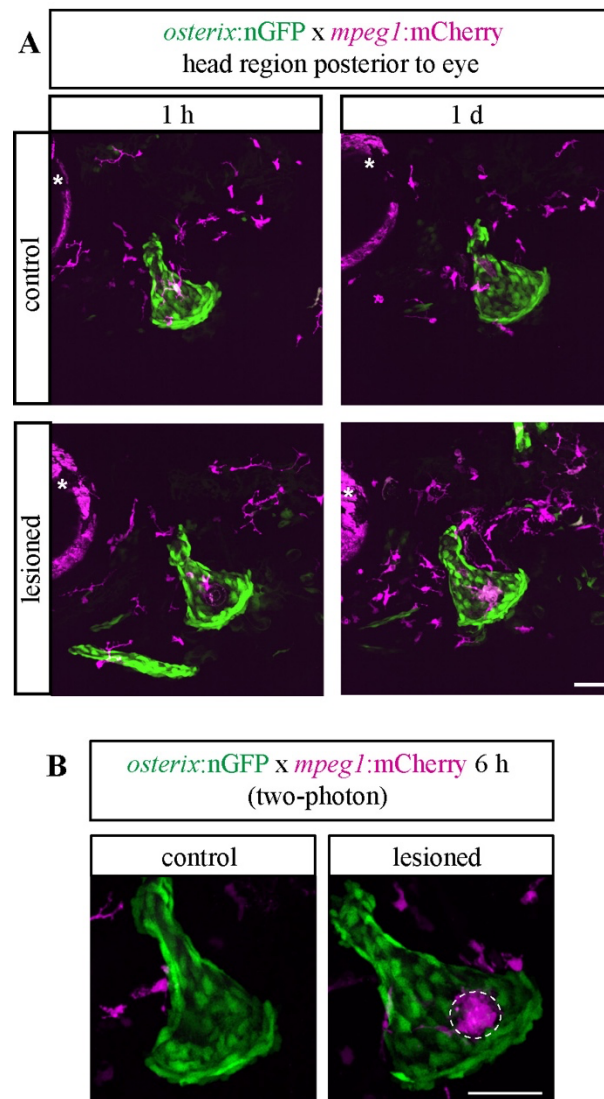


Fig. S4. A: Representative images of experiment quantified in Fig. 4B. The head region posterior to the eye is shown. Asterisk, eye region. Scale bar 50 μ m. **B:** Representative images of uninjured control and lesioned *osterix:nGFP x mpeg1:mCherry* transgenic zebrafish at 6 hpl. The lesion was performed with a two-photon laser. Scale bar 50 μ m.

Fig. S5

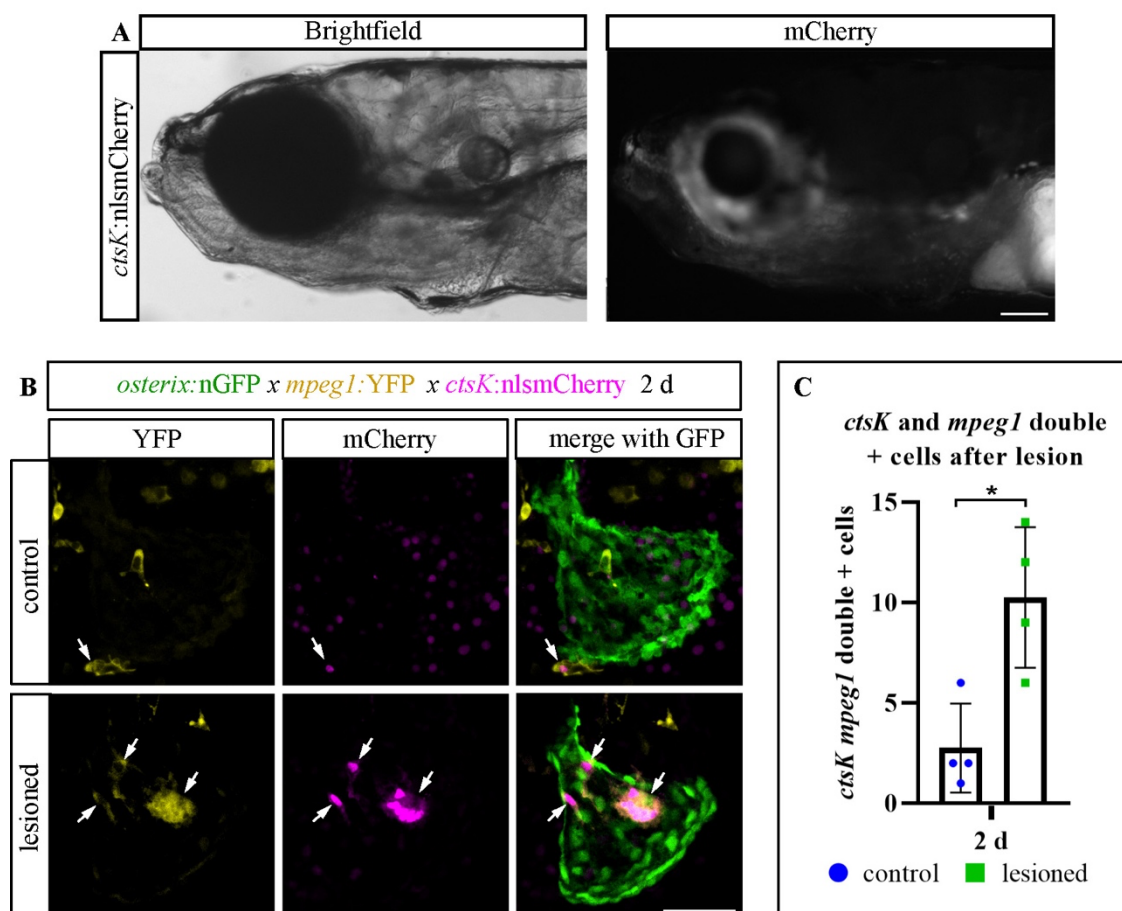


Fig. S5. A: Representative whole-mount image of transgenic *ctsK:nlsMCherry* larval heads at 13 dpf. The signal is visible in the whole lower jaw region, also in areas outside of the opercle region. Scale bar 100 μ m. n = 2. **B:** Triple transgenic *osterix:nGFP x mpeg1:YFP x ctsK:nlsMCherry* unlesioned and lesioned zebrafish at 2 dpl (8 dpf). *ctsK:nlsMCherry/mpeg1:YFP* double positive cells accumulate at the lesion site. Arrowheads indicate double positive cells. Scale bar 50 μ m **C:** Quantification of experiment shown in B. Unpaired two-tailed *t*-test with Welch's correction: **p* = 0.0148. n=4

Fig. S6

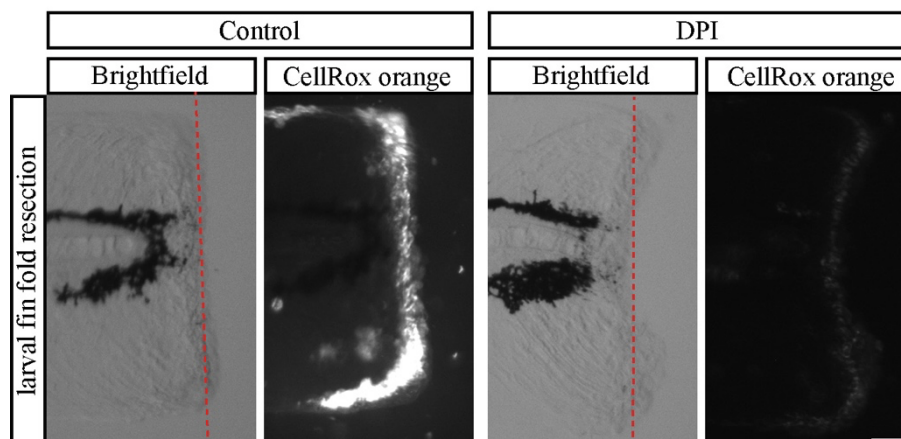


Fig. S6. Representative whole-mount images of ROS production, indicated by CellROX orange staining, 20 min after fin fold resection. The release of ROS can be blocked by a pre-treatment with the antioxidant DPI (diphenyleneiodonium). Scale bar 50 μ m. n = 6

Fig. S7

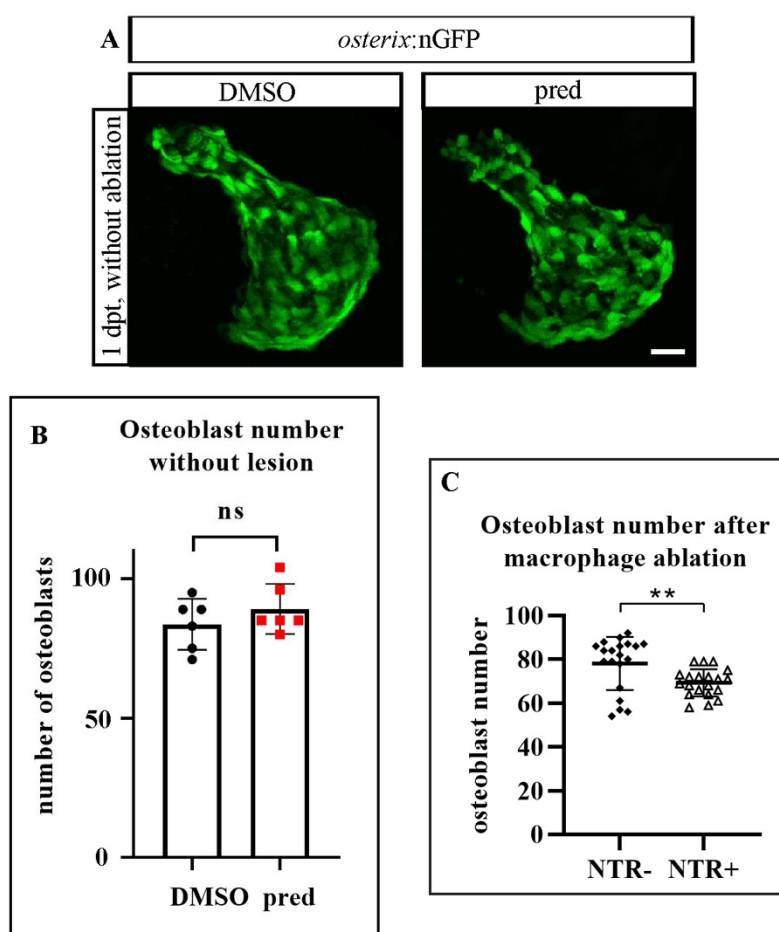


Fig. S7. A: Opercles of *osterix:nGFP* transgenic zebrafish (7 dpf) treated for 1 day with prednisolone or the vehicle control DMSO. Separate experiment than shown in Fig. 9A. Scalebar 20 μ m. n=6 **B:** Quantification of experiment shown in A. Unpaired two-tailed *t*-test with Welch's correction. $p=0.3817$. **C:** Quantification of the number of osteoblasts of the uninjured opercle after ablation of macrophages with NFP. *osterix:RFP* x *mpeg1:YFP-NTR+* larvae and *mpeg1:YFP-NTR* negative siblings were incubated for 6 days with NFP. A reduced number of osteoblasts at 9 dpf was detected in case of macrophage ablation. Unpaired two-tailed *t*-test with Welch's correction. $p = 0.0071$. $n = 20$.

Fig. S8

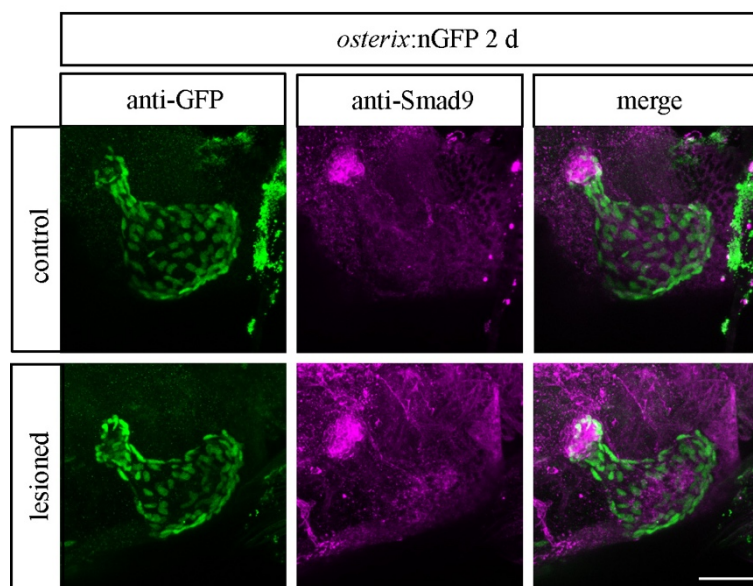
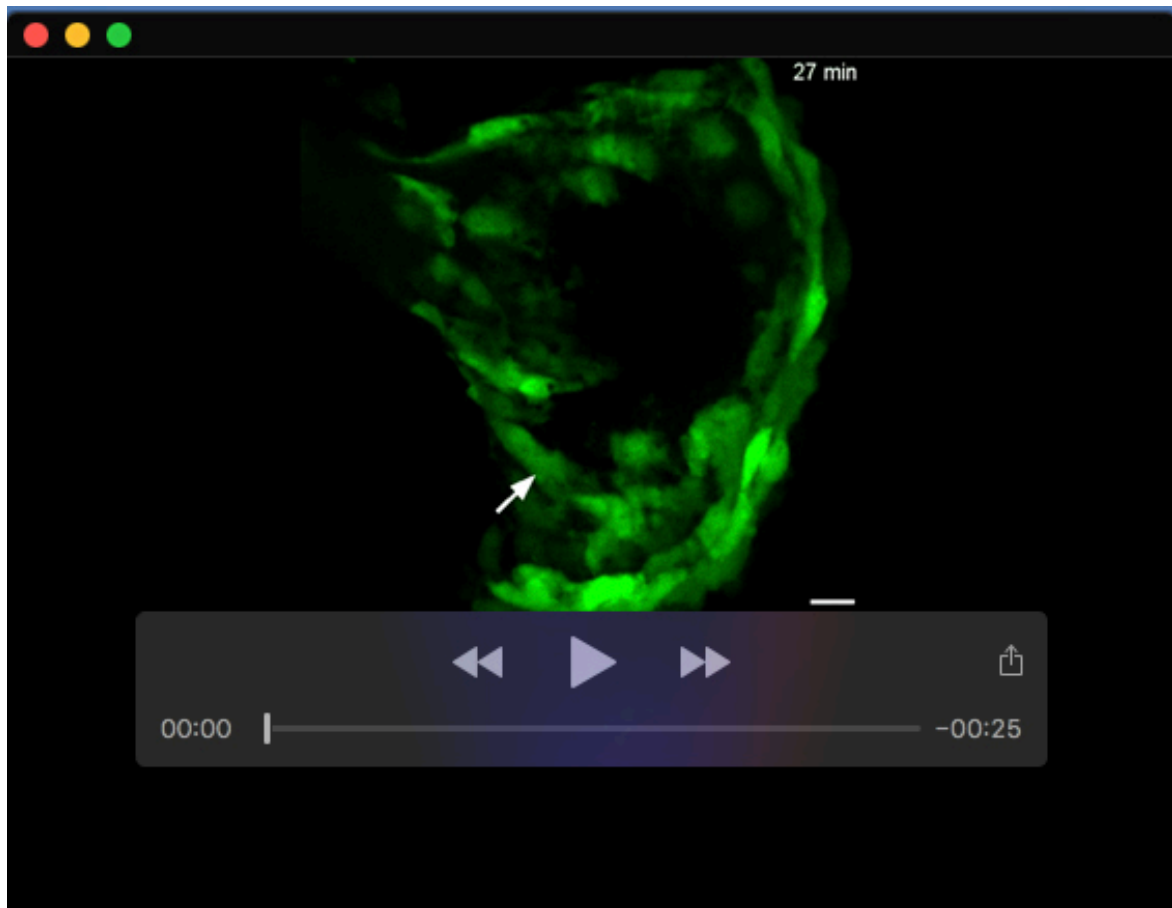
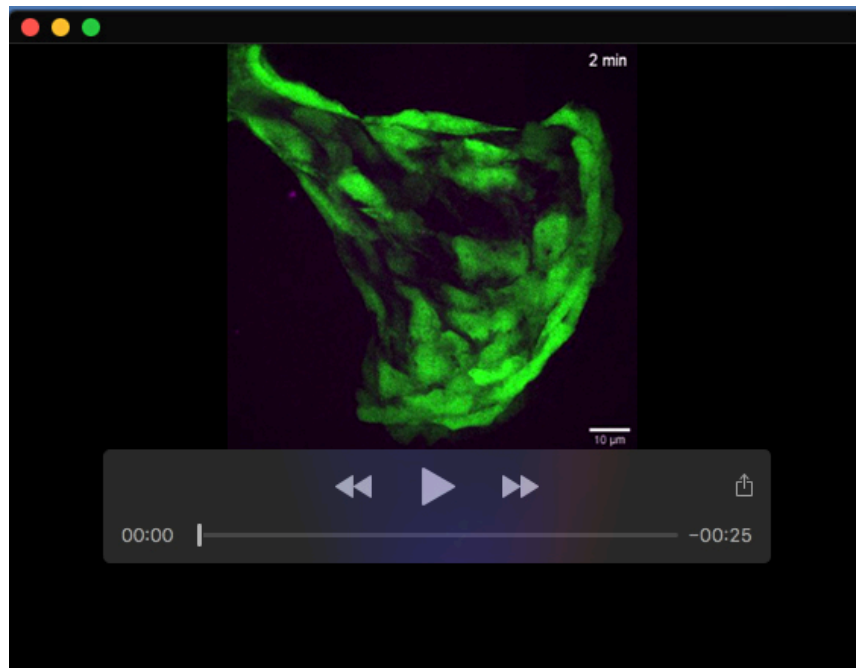


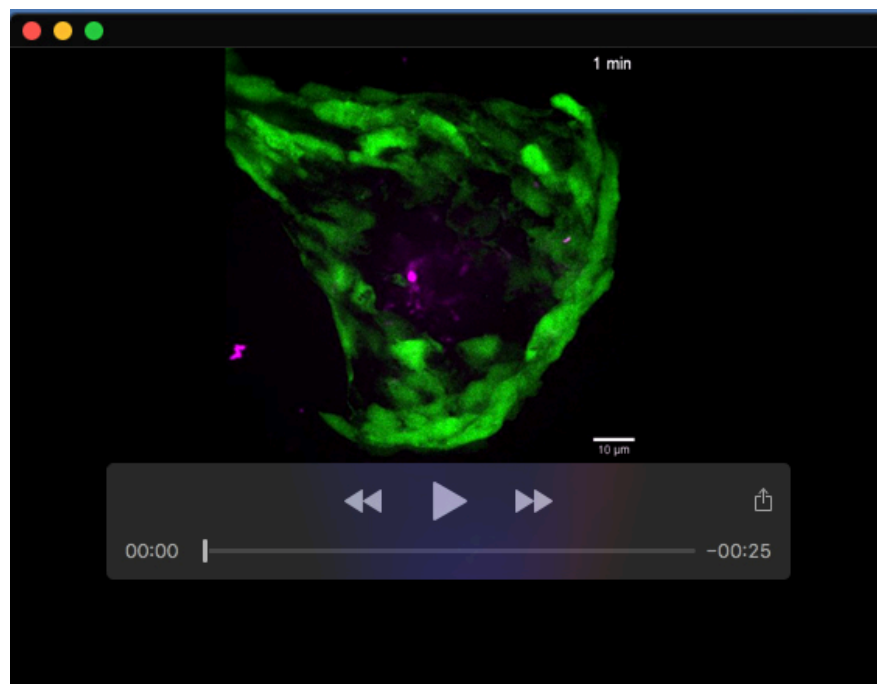
Fig. S8: Immunohistochemical staining in uninjured control and lesioned *osterix:nGFP* zebrafish at 8 dpf (2 dpl) against GFP and Smad9. Scalebar 50 μ m. n=3.



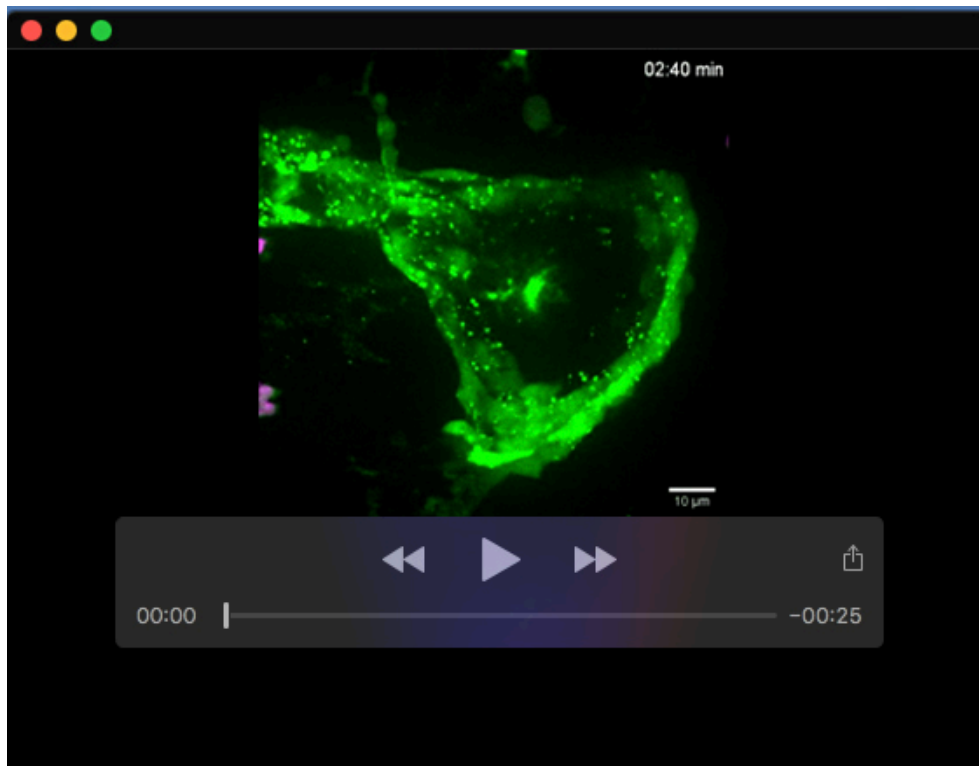
Movie 1. (supplement to Fig. 2): Movie showing a proliferating osteoblast in the opercle of *osterix:nGFP* transgenic zebrafish after osteoblast ablation. The position of the proliferating osteoblast is indicated by the white arrow. Division can be observed after roughly 4 h. Scale bar 10 μ m.



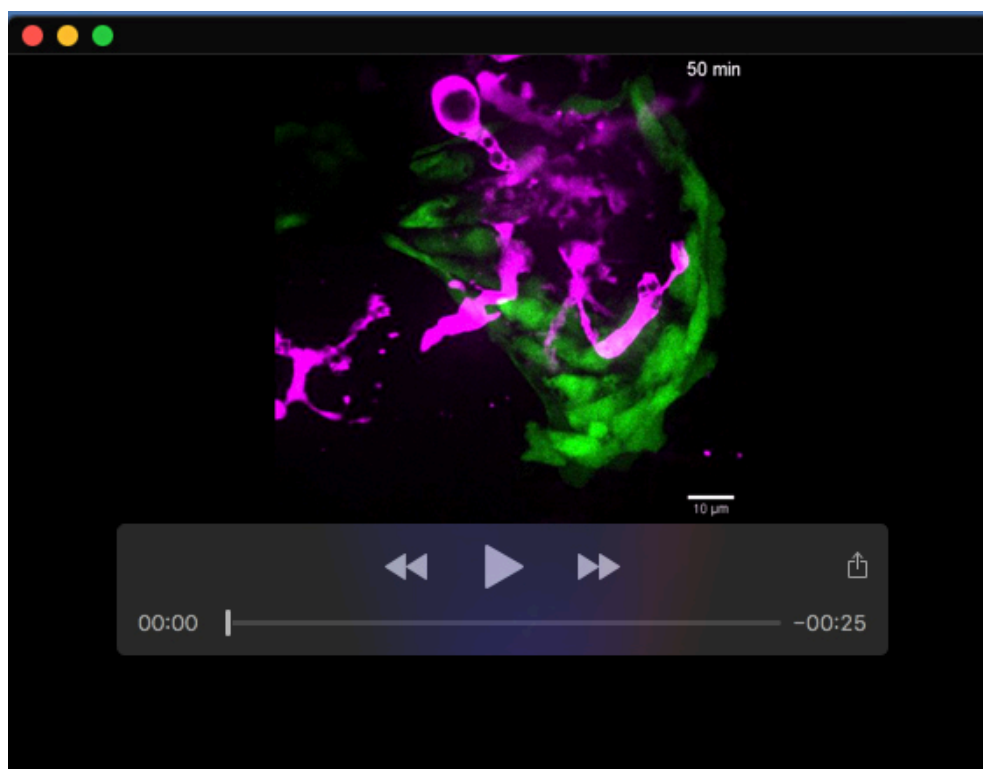
Movie 2. (supplement to Fig. 3C): Movie showing absence of CellRox orange staining in a transgenic 6 dpf *osterix:nGFP* zebrafish without osteoblast ablation. Scale bar 10 μ m.



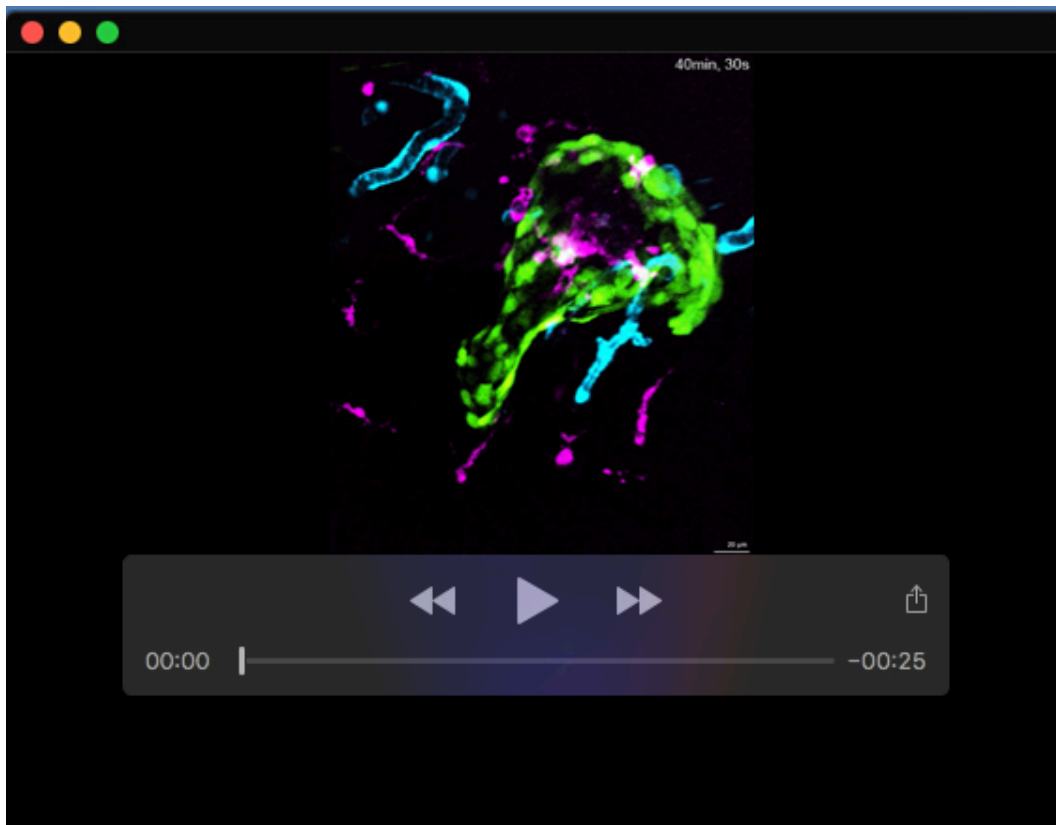
Movie 3 (supplement to Fig. 3C): Movie showing increasing CellRox orange staining, as a readout for ROS release, in a transgenic 6 dpf *osterix:nGFP* zebrafish after osteoblast ablation. The increase of ROS is observed immediately lesion. Scale bar 10 μ m.



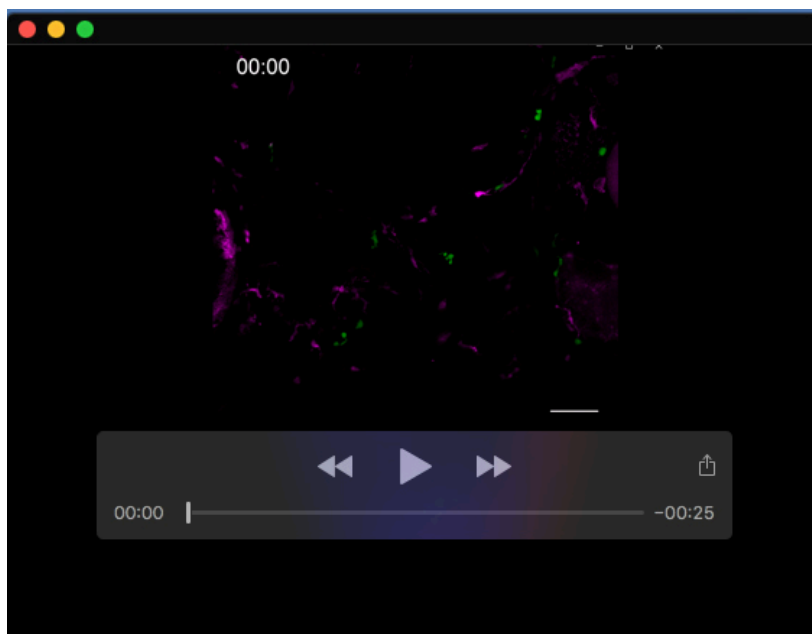
Movie 4. (supplement to Fig. 4A): Movie showing the recruitment of neutrophils, labeled in magenta, into the area of osteoblast lesion. Neutrophils and other immune cells show some autofluorescence in the RFP channel (RFP depicted in green). Scale bar 10 μ m.



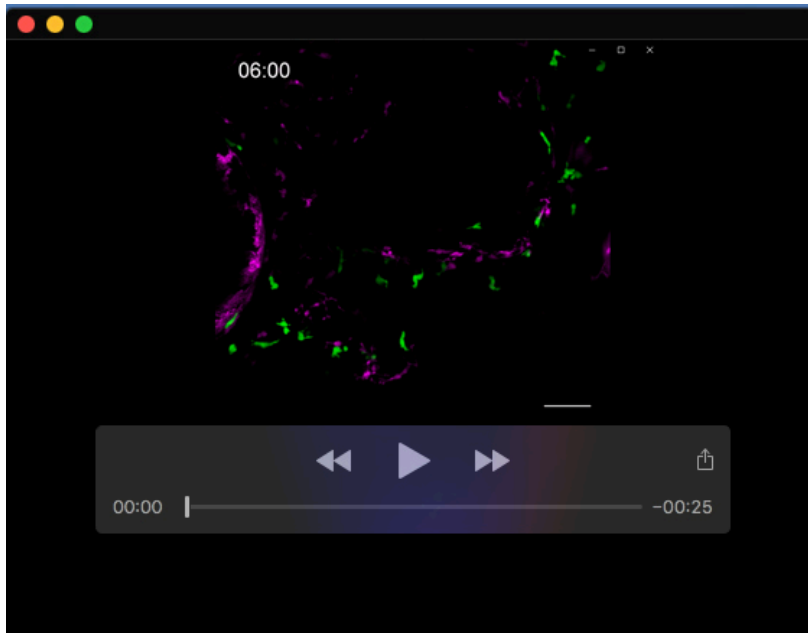
Movie 5. (supplement to Fig. 4C): Movie showing the recruitment of macrophages, labeled in magenta, into the area of osteoblast lesion. Scale bar 10 μ m.



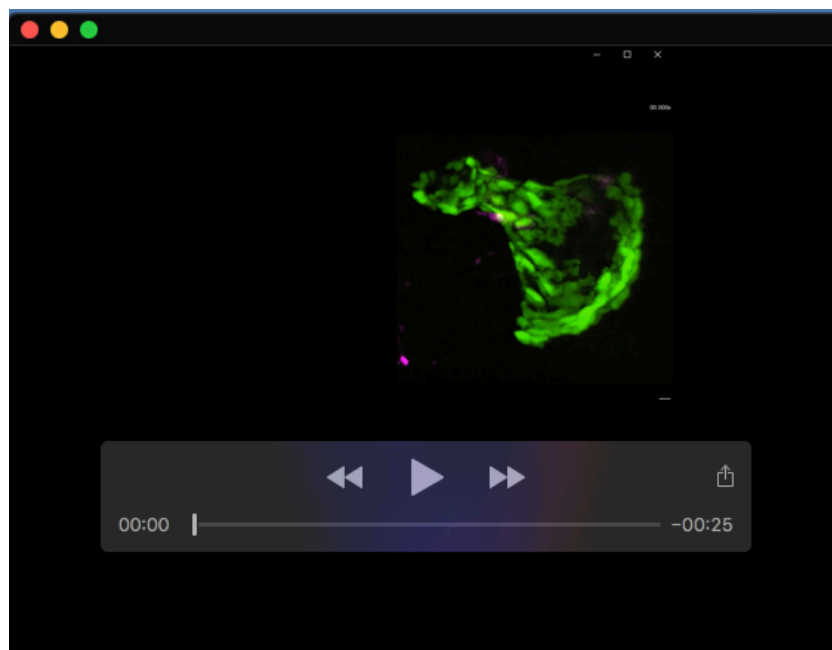
Movie 6. (supplement to Fig. 4E): Movie showing the recruitment of macrophages from the surrounding tissue and not from blood vessels after osteoblast lesion. Scale bar 20 μm .



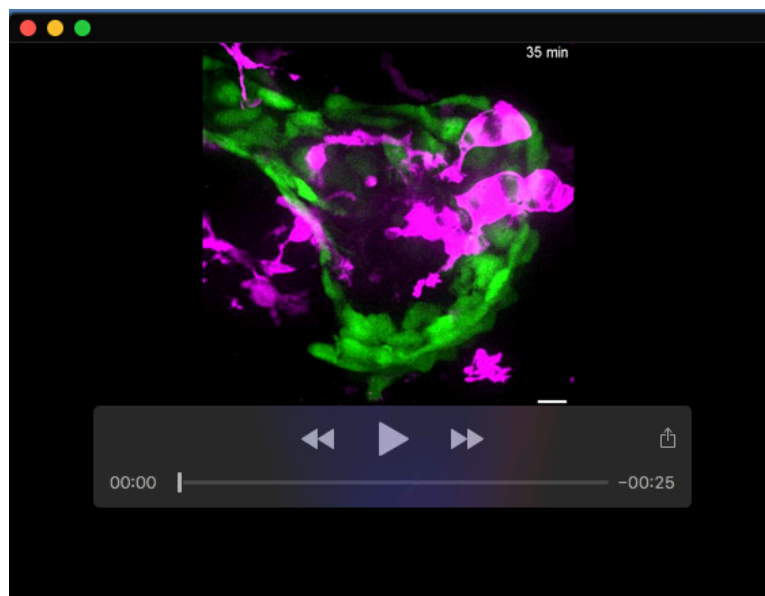
Movie 7. (supplement to Fig. 6): Movie showing the region posterior to the eye harboring neutrophils (labeled in green) and macrophages (labeled in magenta), after control treatment. Scale bar 50 μm .



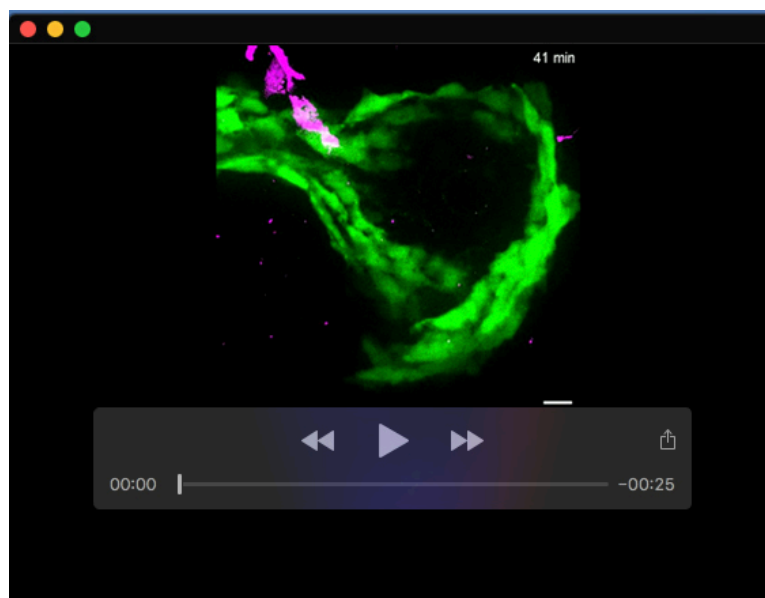
Movie 8. (supplement to Fig. 6): Movie showing the region posterior to the eye harboring neutrophils (labeled in green) and macrophages (labeled in magenta), after DPI treatment. Scale bar 50 μ m.



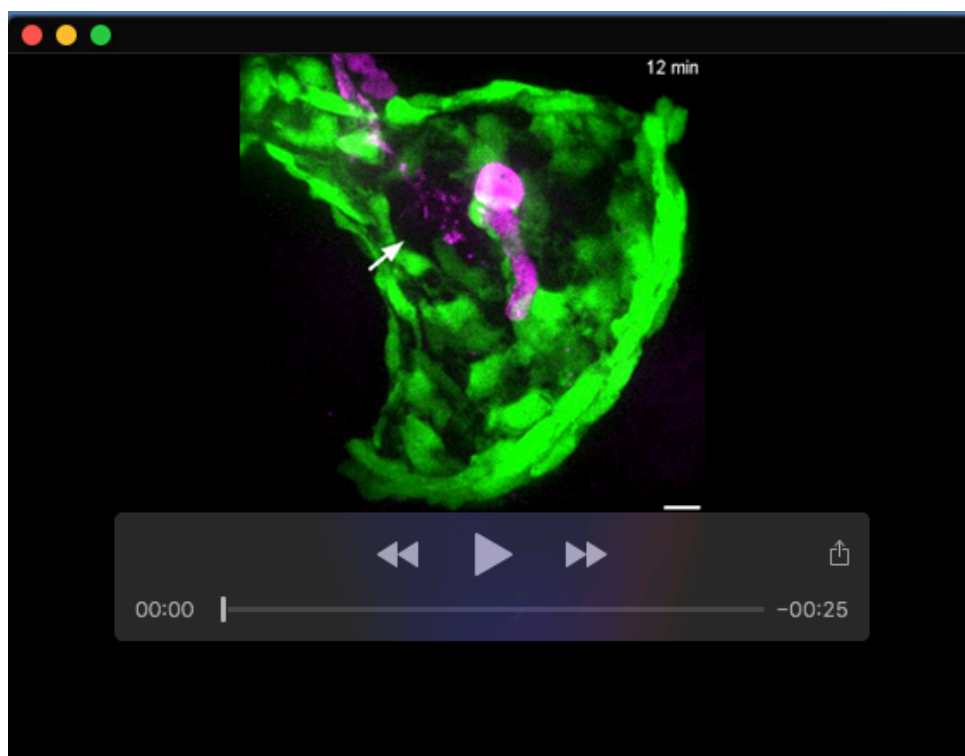
Movie 9. (supplement to Fig. 6): Movie showing the impaired recruitment of macrophages, labeled in magenta, into the area of osteoblast lesion after pre-treatment with the antioxidant DPI. Scale bar 10 μ m.



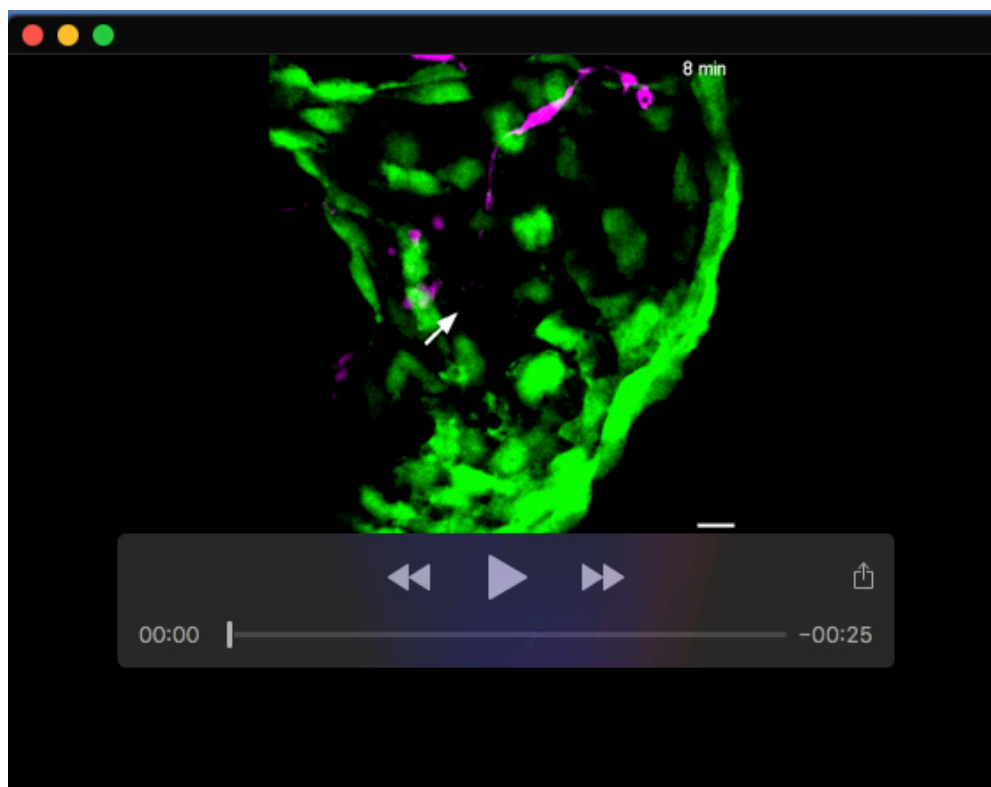
Movie 10. (supplement to Fig. 7B): Movie showing recruitment of macrophages, labeled in magenta, into the area of osteoblast lesion after DMSO treatment. The response is comparable to the untreated response observed in laser-ablated, otherwise untreated zebrafish (see Movie 5). Scale bar 10 μ m.



Movie 11. (supplement to Fig. 7B): Movie showing reduced recruitment of macrophages, labeled in magenta, into the area of osteoblast lesion after prednisolone treatment. Please compare with the response in control-treated (Movie 10) and untreated (see Movie 5) individuals. Scale bar 10 μ m.



Movie 12. (supplement to Fig. 8B): Movie showing recruitment of macrophages, labeled in magenta, into the area of a small osteoblast lesion after DMSO treatment. The response is weaker compared to the response observed in the larger laser-ablated osteoblast lesioned, otherwise untreated zebrafish (see Movie 5). Scale bar 10 μm .



Movie 13. (supplement to Fig. 8B): Movie showing reduced recruitment of macrophages, labeled in magenta, into the area of a small osteoblast lesion after prednisolone treatment. Please compare with the response in control-treated (Movie 12) and larger lesion prednisolone-treated (see Movie 11) individuals. Scale bar 10 μm .