

Fig. S1. Characterization of epidermal keratinocyte transgenes. (A) Validation of keratinocyte phagosome transgenes in larval zebrafish. Laser axotomy of axons emanating from trigeminal neurons results in WD, followed by axonal debris internalization into keratinocyte phagosomes. Asterisk denotes site of axotomy. Shown are representative confocal micrographs before and during axon degeneration. Time mm:ss. (B) Schematic depicting gradients of transgene expression patterns in adult epidermis. (C, D) Reconstructed cross-sections showing expression of *Tg(krt4:EGFP-2xFYVE)* and *TgBAC($\Delta Np63$:EGFP-2xFYVE)* in adult epidermis. (E) LysoTracker co-localization with EGFP-2xFYVE+ structures (arrowheads). Scale bars: 10 μ m (A, C,D), 1 μ m (E).

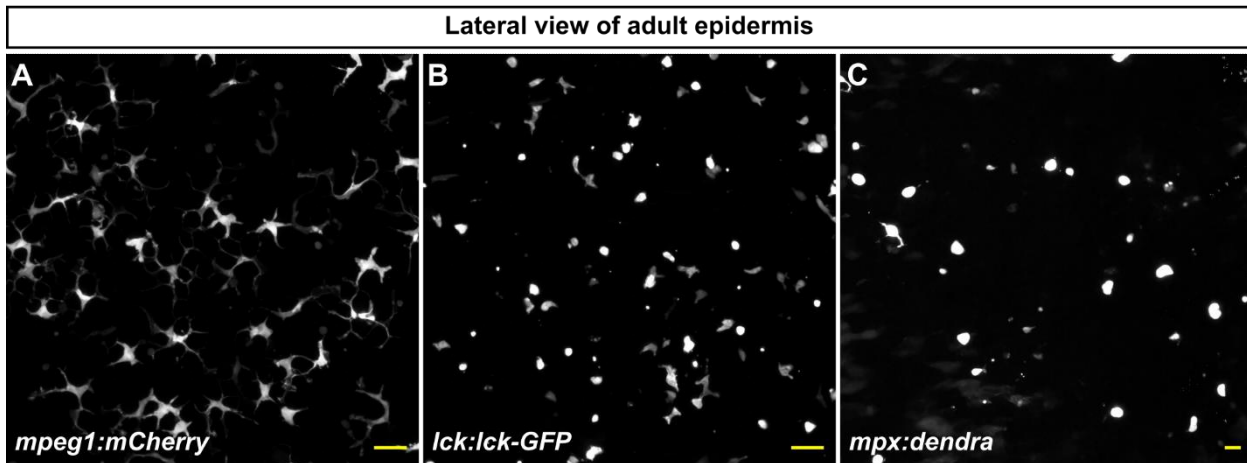


Fig. S2. Identification of different immune cell populations present in adult epidermis. (A-C) Lateral confocal views of the adult *ex vivo* scale epidermis expressing the indicated transgenes. Scale bars: 20 μ m.

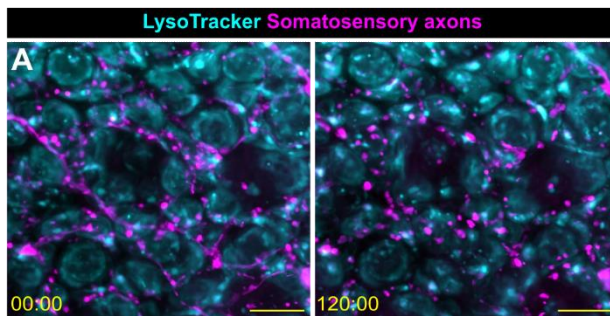


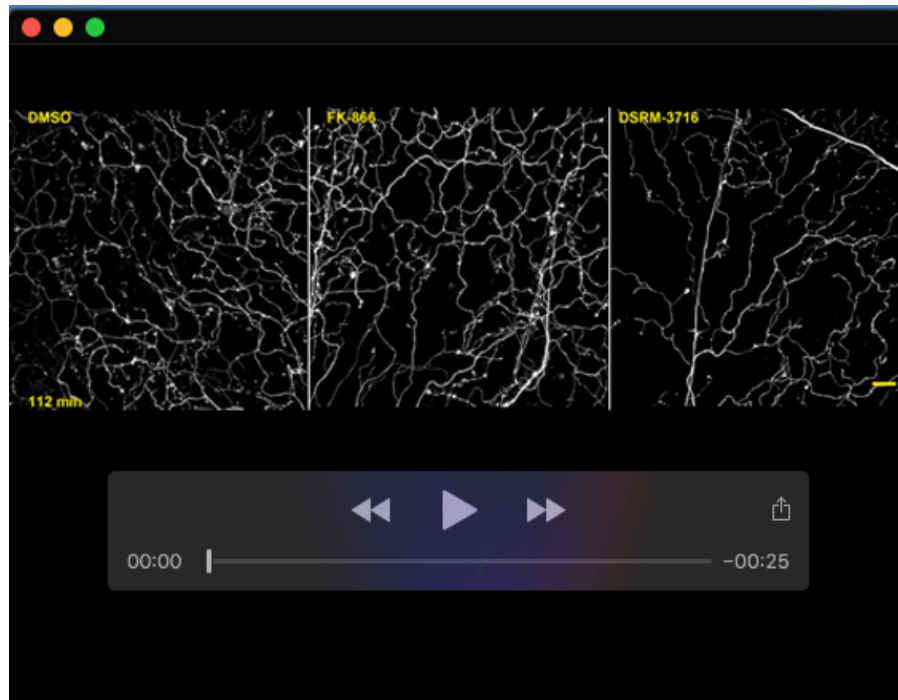
Fig. S3. Axonal debris does not compartmentalize into other Lysotracker+ vesicles after 2 hours. Lysotracker staining did not reveal other potential cell populations engulfing debris, and debris remains unengulfed after 2 hours. Time stamp mm:ss, scale bar 10 μ m.

Table S1. Key resources

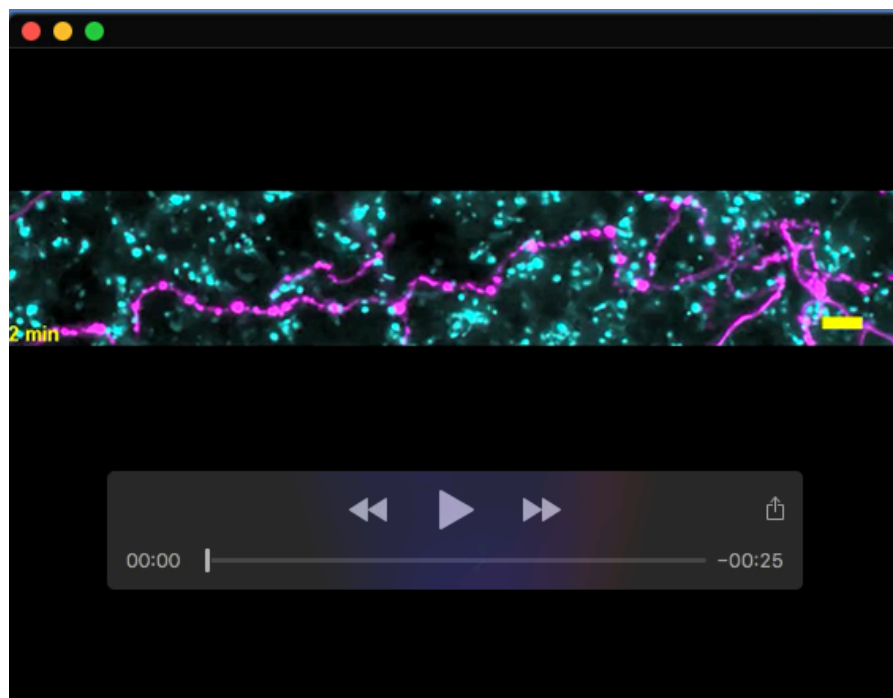
[Click here to download Table S1](#)

Table S2. Replicate details

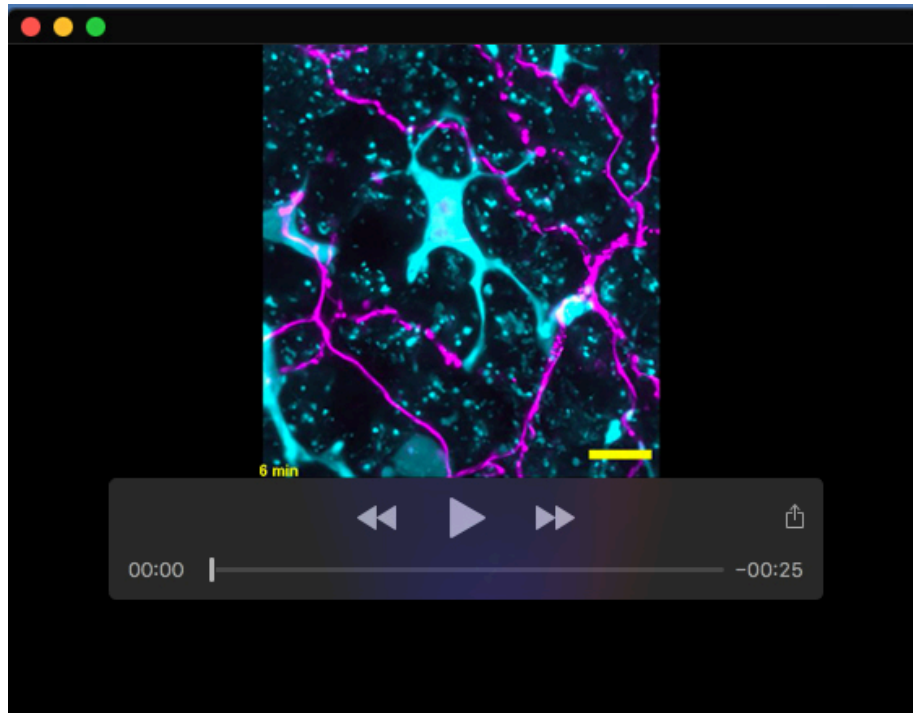
[Click here to download Table S2](#)



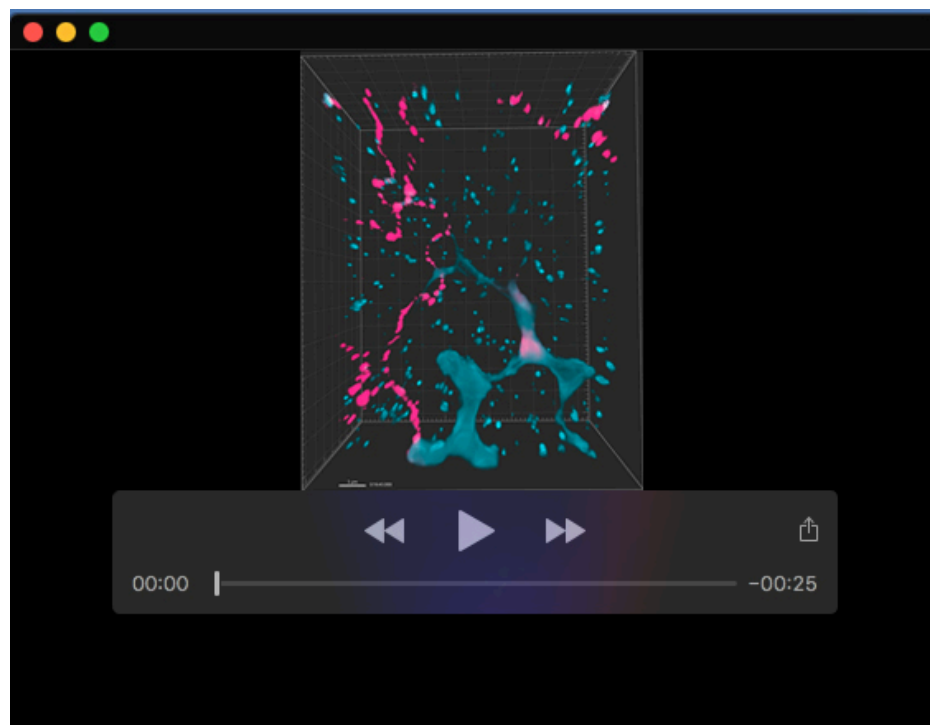
Movie 1. Time-lapse microscopy of *Tg(p2rx3a:mCherry)*+ axons in control conditions or treated with FK866 or DSRM-3716.



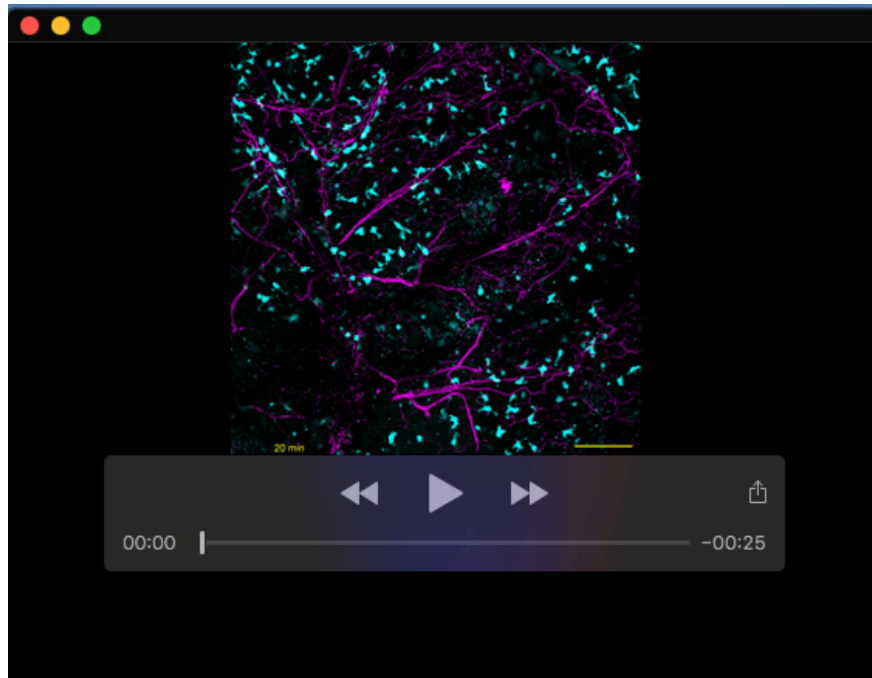
Movie 2. Time-lapse microscopy of *Tg(krt4:EGFP-2xFYVE);TgBAC(ΔNp63:EGFP-2xFYVE)*+ phagosomes engulfing a small quantity of *Tg(p2rx3a:mCherry)*+ axon debris. Time 0 denotes onset of axon degeneration.



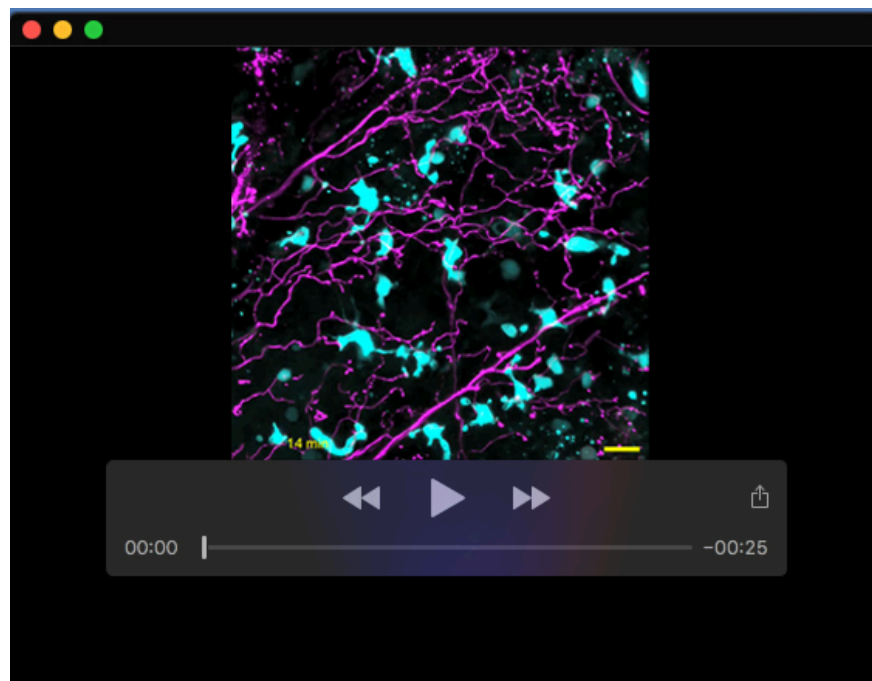
Movie 3. Time-lapse microscopy of *Tg(p2rx3a:mCherry)*+ debris being internalized by *Tg(mpeg1:NTR-EYFP)* cells. Time 0 denotes onset of axon degeneration.



Movie 4. Imaris volume-blended time-lapse microscopy of *Tg(p2rx3a:mCherry)*+ debris being internalized by *Tg(mpeg1:NTR-EYFP)* cells.



Movie 5. *In vivo* time-lapse microscopy of a scale injury in *Tg(p2rx3a:mCherry;Tg(mpeg1: NTR-EYFP)* animals.



Movie 6. Cropped and magnified view from video 5 showing *Tg(p2rx3a:mCherry)*+ debris being internalized by *Tg(mpeg1:NTR-EYFP)* cells.

Supplementary References

Ellett, F., Pase, L., Hayman, J. W., Andrianopoulos, A. and Lieschke, G. J. (2011). mpeg1 promoter transgenes direct macrophage-lineage expression in zebrafish. *Blood* **117**, e49-56.

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Walters, K. B., Green, J. M., Surfus, J. C., Yoo, S. K. and Huttenlocher, A. (2010). Live imaging of neutrophil motility in a zebrafish model of WHIM syndrome. *Blood* **116**, 2803–2811.