

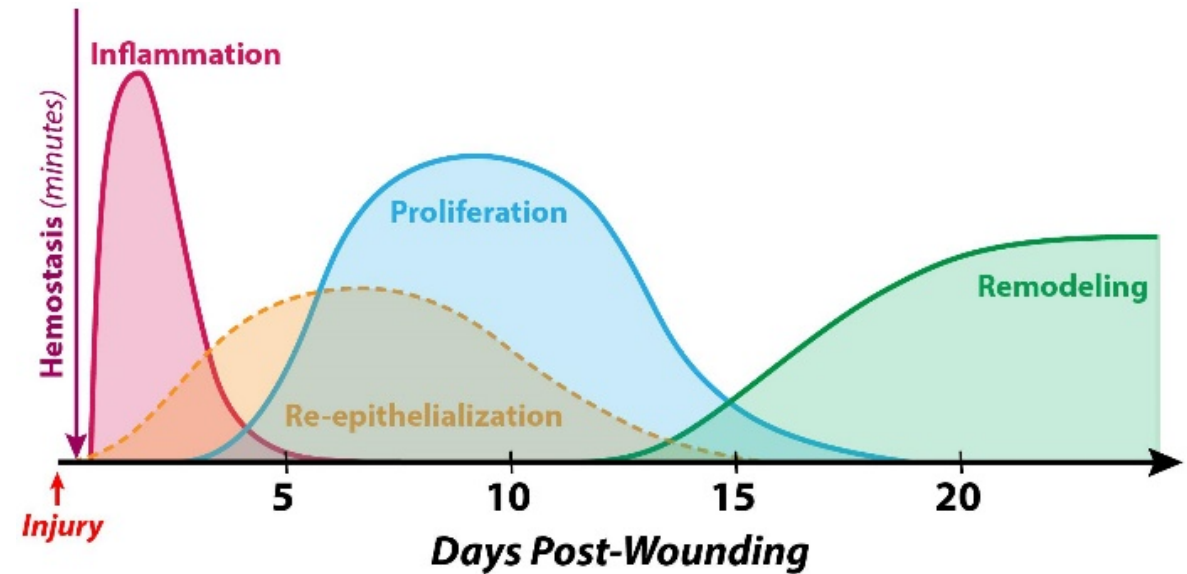
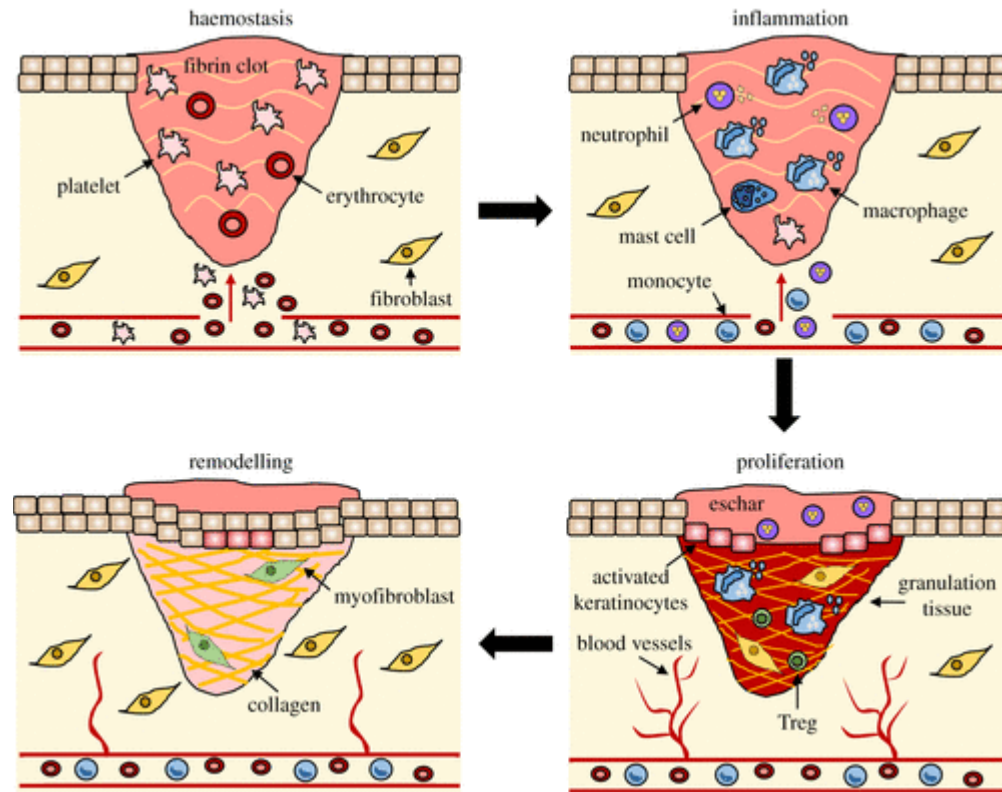
Injury-activated glial cells promote wound healing of the adult skin in mice

Parfejevs et al.

NATURE COMMUNICATIONS | (2018) 9:236

DOI: [10.1038/s41467-017-01488-2](https://doi.org/10.1038/s41467-017-01488-2)

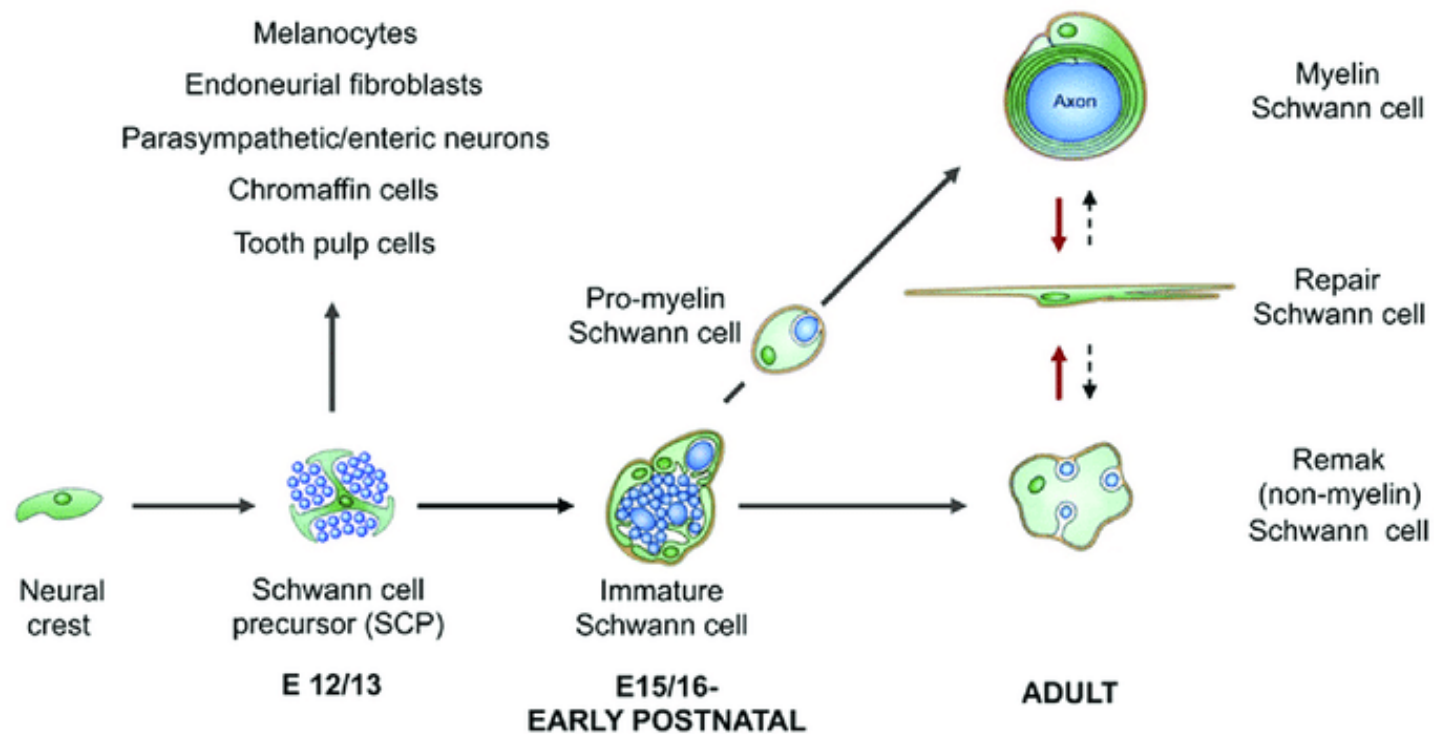
Wound repair



(Wilkinson and Hardman 2020)
 (desJardins-Park, Mascharak et al. 2019)

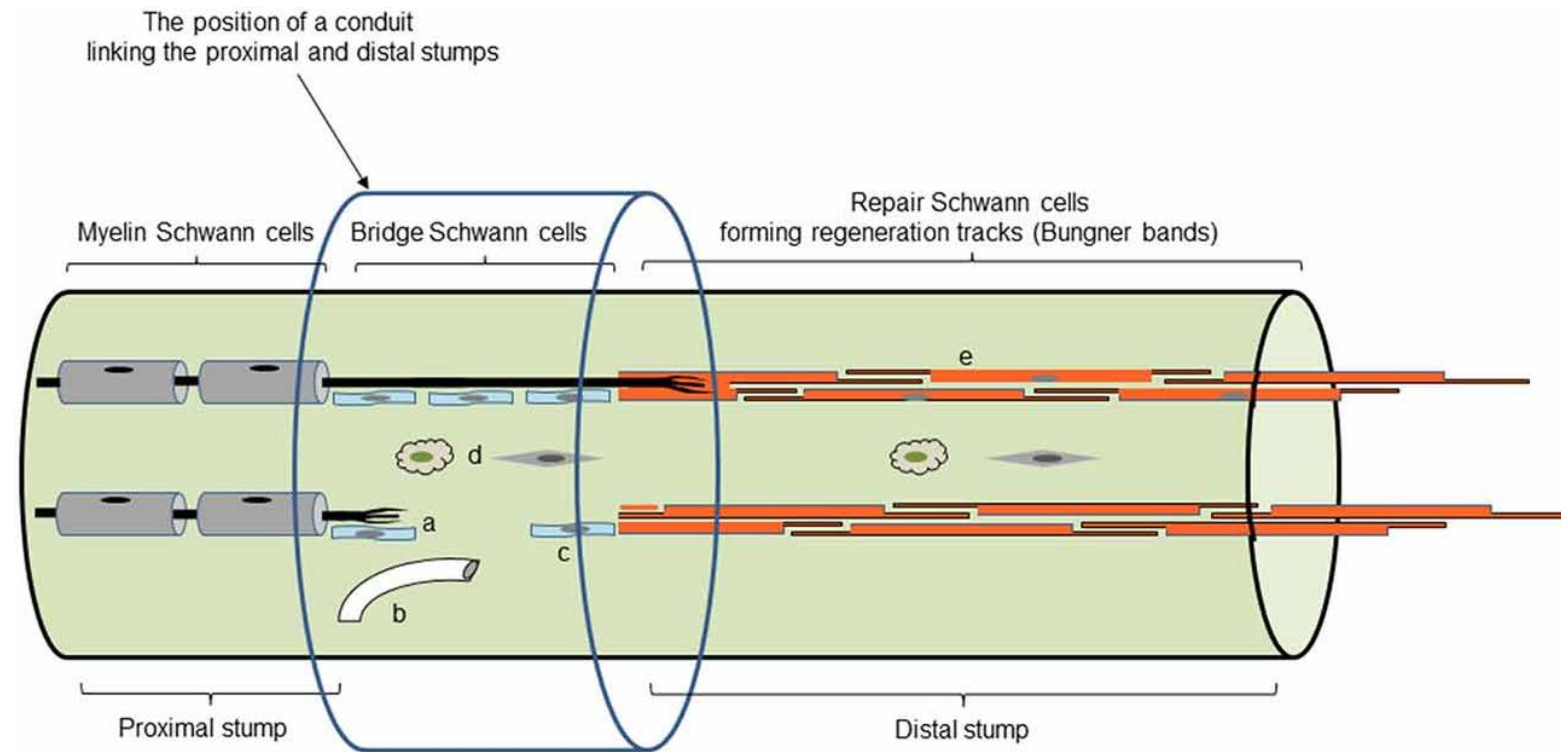
Schwann cells - development

Main transitions in the Schwann cell precursor lineage during development and in the adult



(Jessen & Mirsky, 2019)

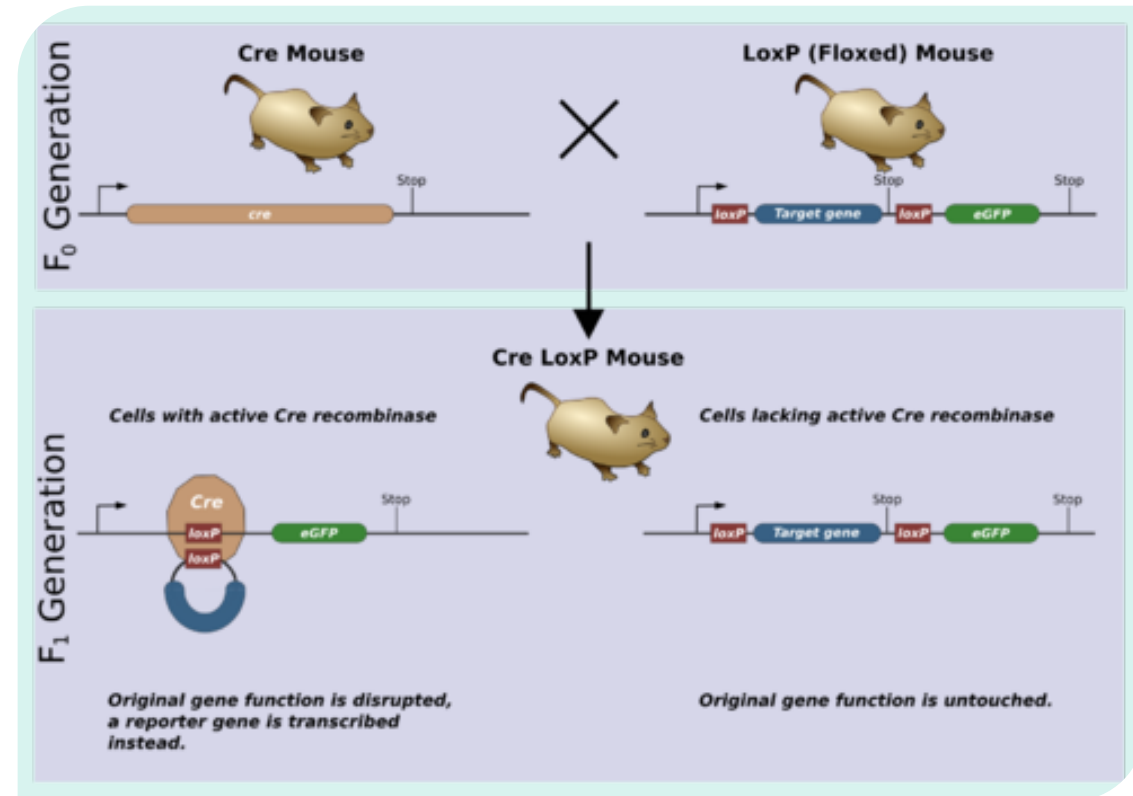
Schwann cells function



(Jessen & Mirsky, 2019)

Cre/loxP-System

- Cre = site specific recombinase enzyme
- Gene knock out / knock in
- Translocation
- Inversion
- Activated by Tamoxifen

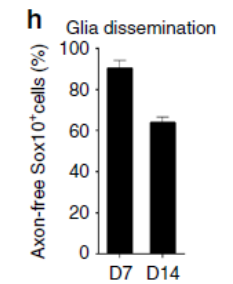
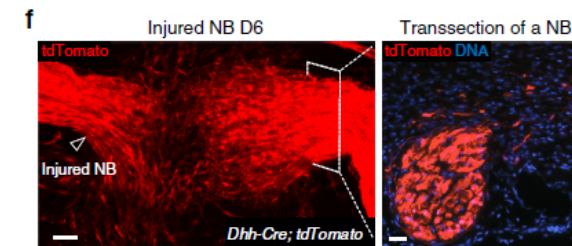
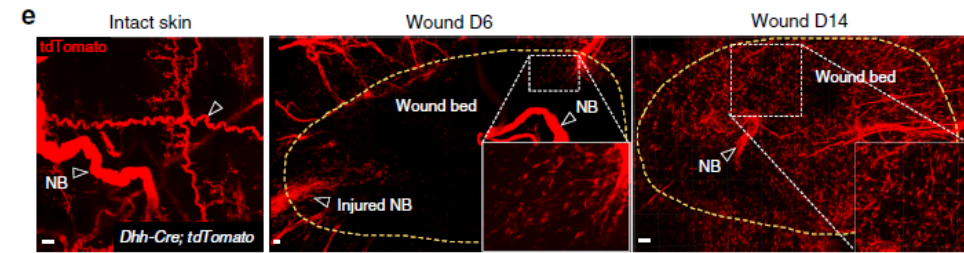
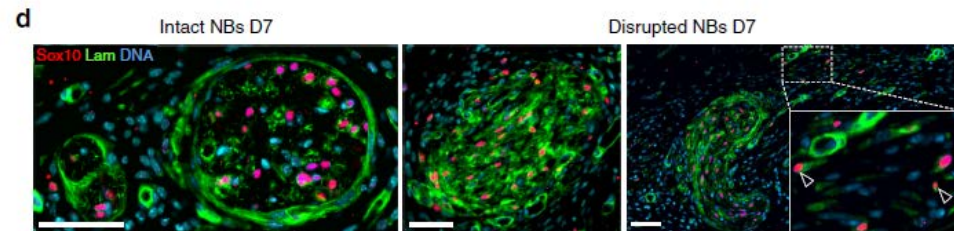
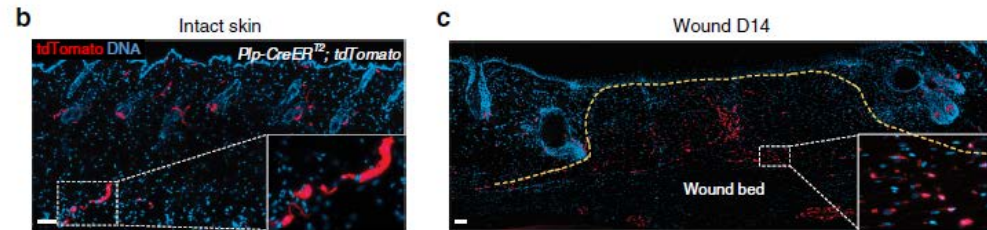


Methods

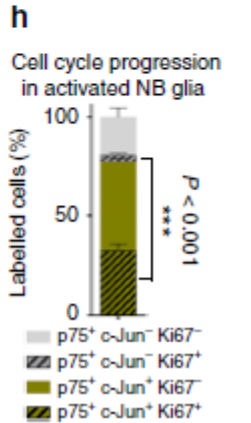
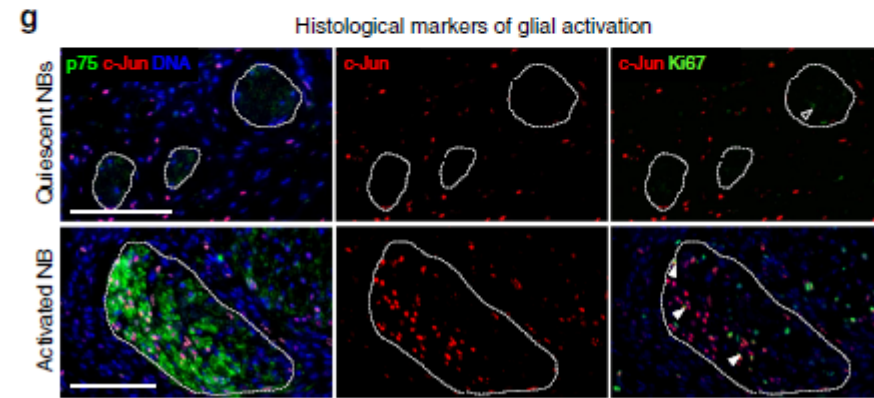
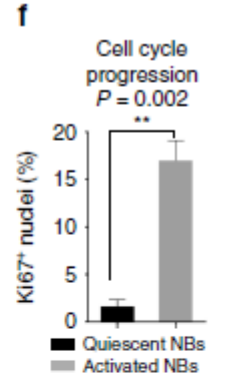
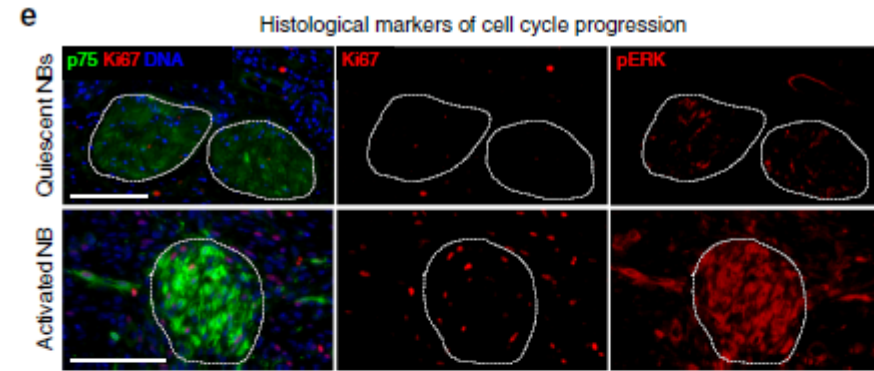
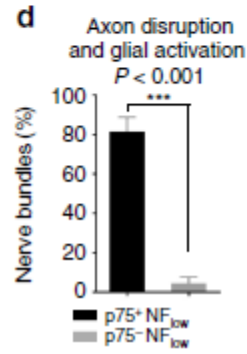
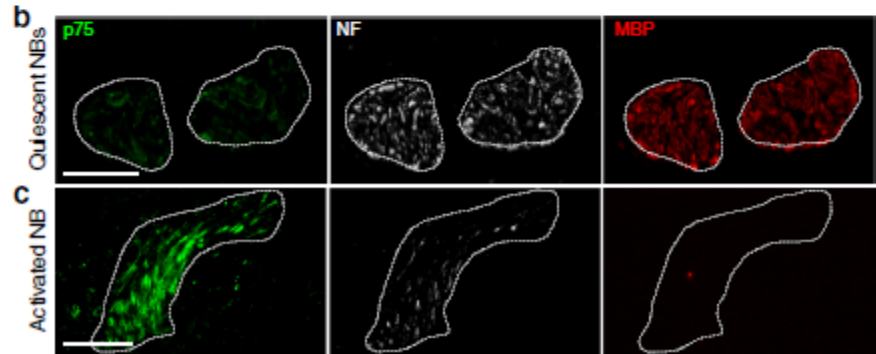
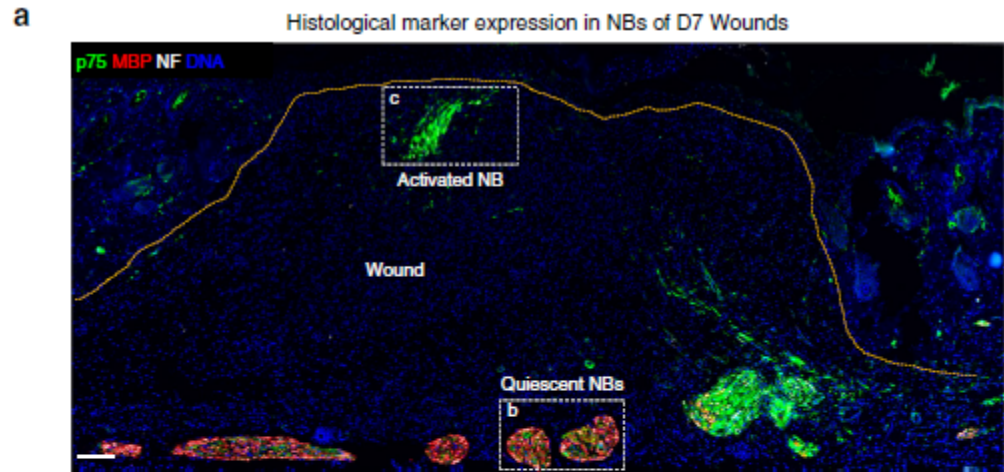
- Mouse strains: Dhh-Cre; tdTomato
Plp-CreER^{T2}; tdTomato
Plp-CreER^{T2}; Pten^{lox/lox} ; tdTomato
Plp-CreER^{T2}; Sox10^{lox/lox} ; tdTomato
Tyr-CreER^{T2}; tdTomato
- IF-stainings
- Western blotting
- SN Exp co-culture
- Bulkseq-Analysis

PLP= Proteolipid protein (*Glial cell-marker*)
Dhh= Desert hedgehog (*Schwann cell-marker*)
Pten= Phosphatase and tensin homolog (*inhibits SC proliferation*)
Sox10= (*survival and maintenance factor during differentiation*)
Tyr= Tyrosinase (*Melanocyte-marker*)

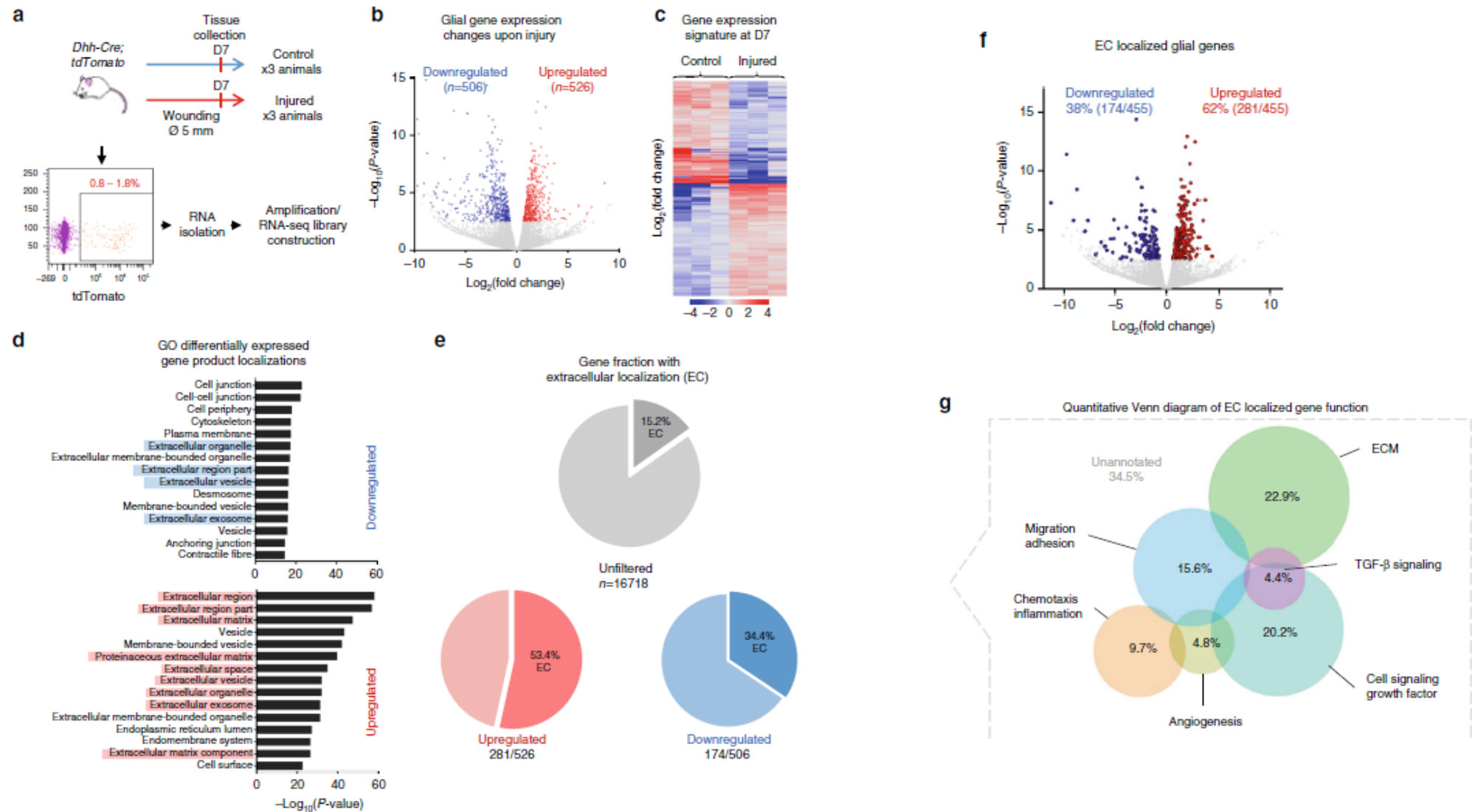
Results – The Cells



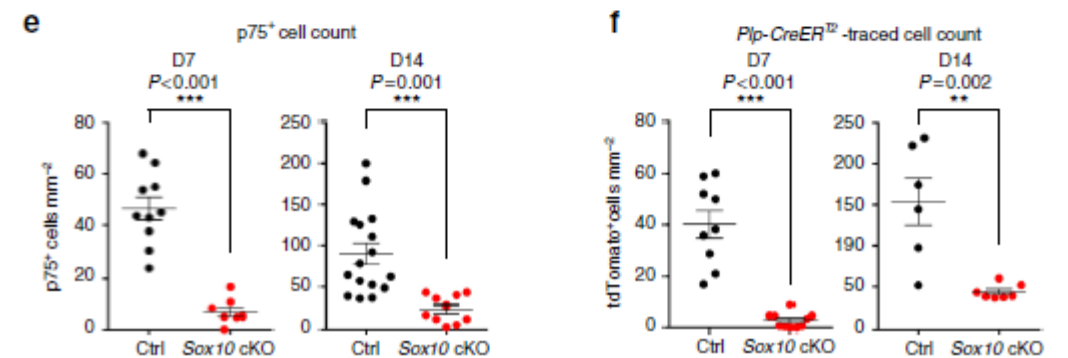
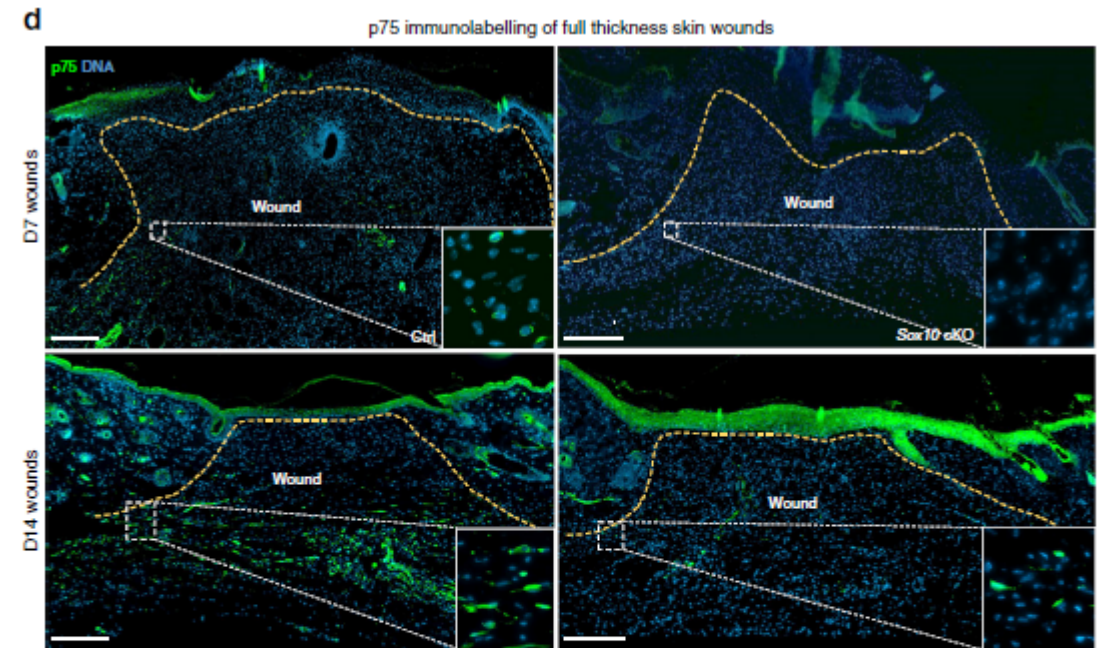
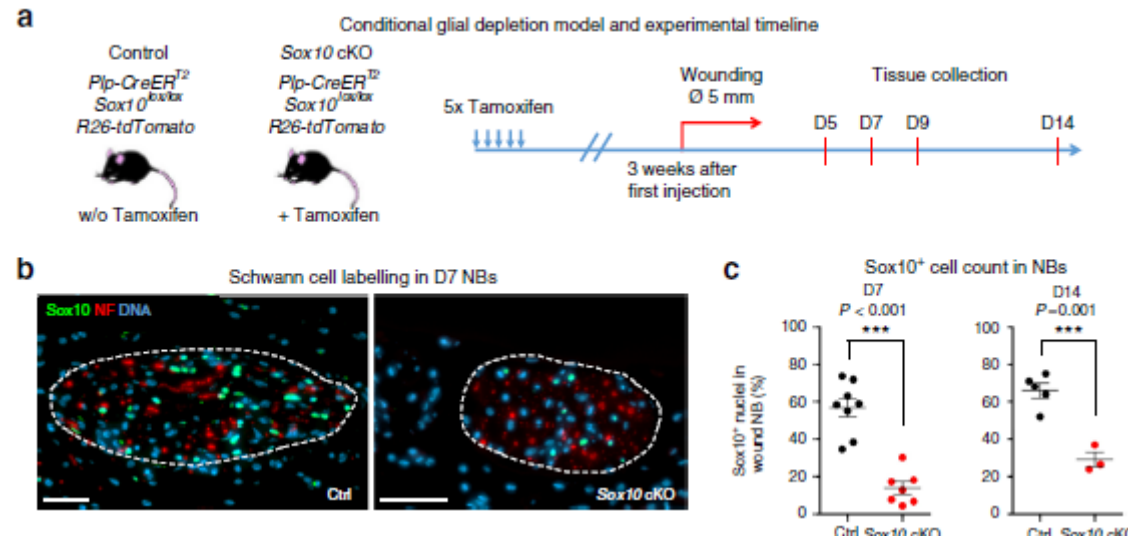
Results – Classification



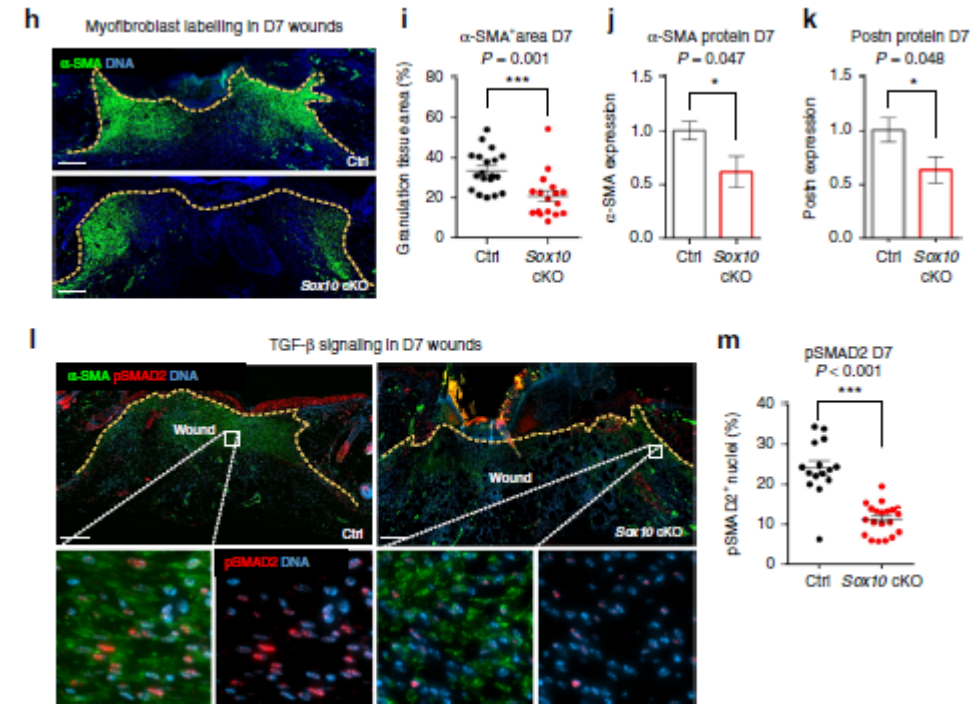
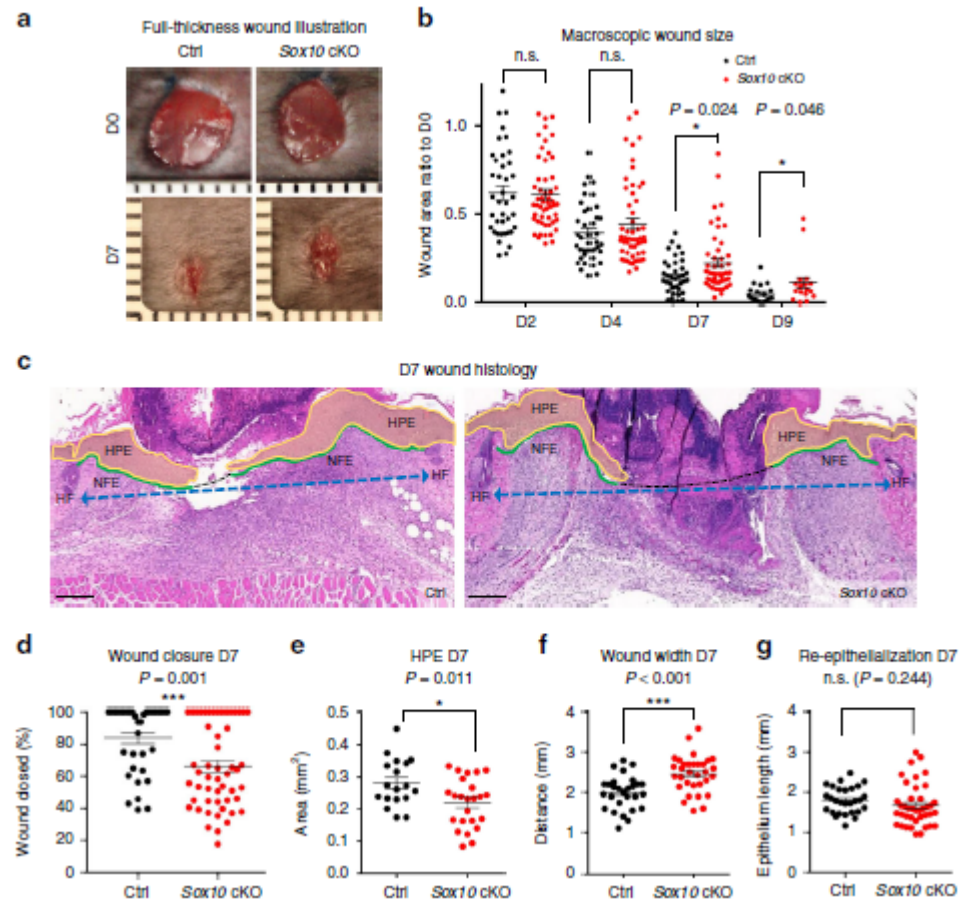
Results - Function



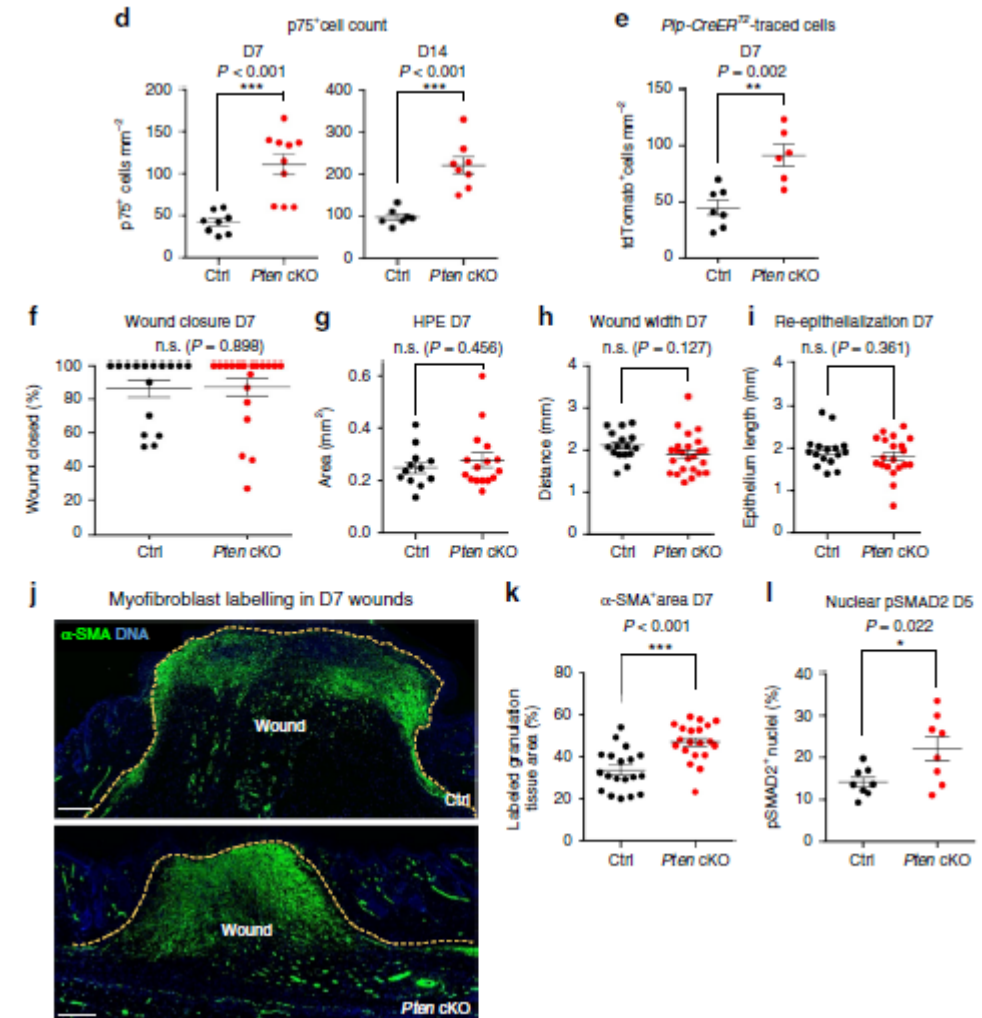
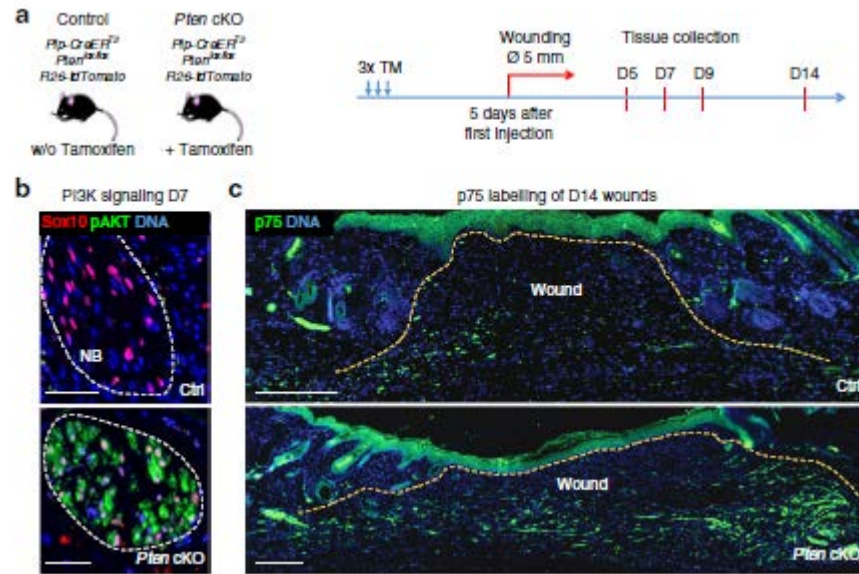
Results - Inhibition



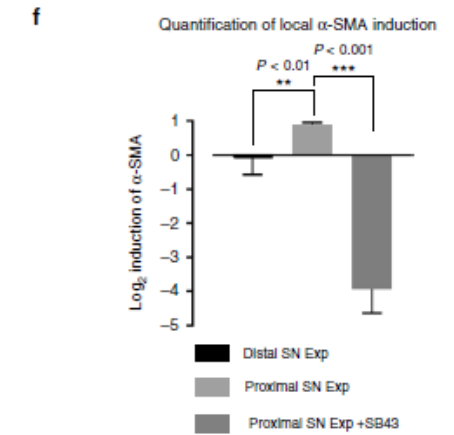
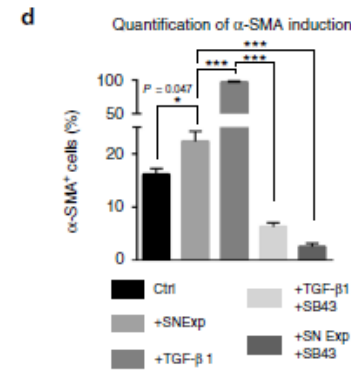
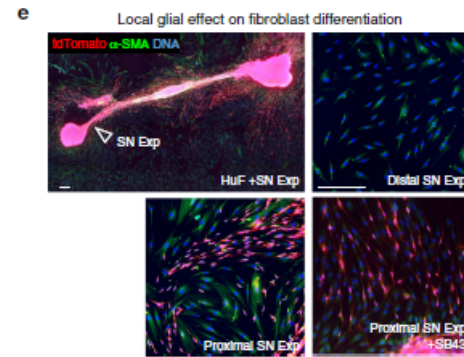
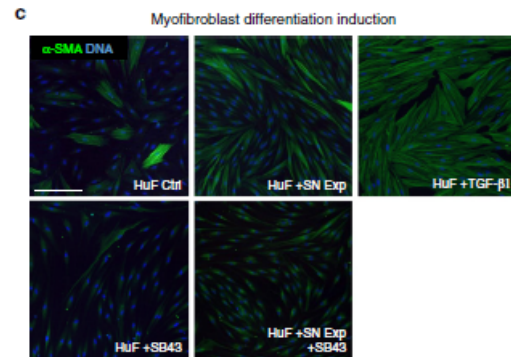
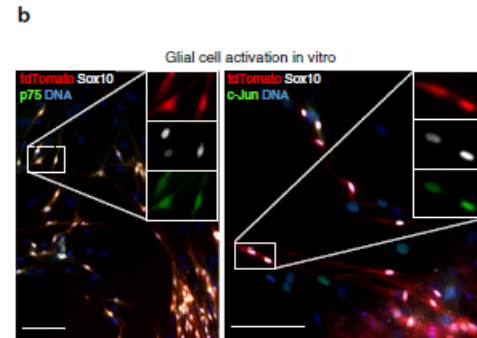
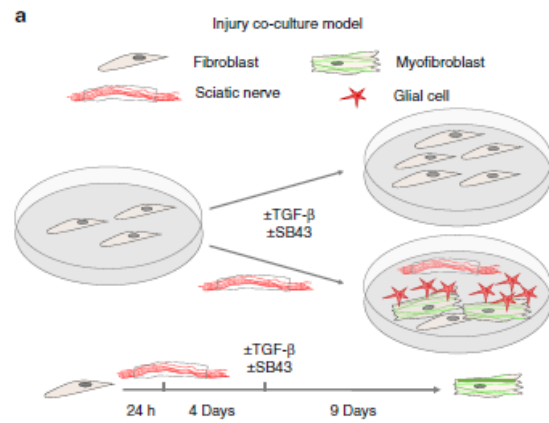
Results – Inhibition impact



Results - Boost



Results – The culture



Discussion

- Skin cells or the nerve?
- The secretome
- TGF- β and POSTN
- Other cells (stem cells, progenitor cells)
- Celltypes or dynamic population
- Tissue implication
- Conversion



Conclusion

Injury activated peripheral glia

- dedifferentiate, proliferate and disseminate into the wound area
- have multiple effects in human wound healing (TGF- β , Periostin)

Literature

- Wilkinson, H. N., & Hardman, M. J. (2020). Wound healing: cellular mechanisms and pathological outcomes. *Open Biol*, *10*(9), 200223. doi:10.1098/rsob.200223
- desJardins-Park, H. E., Mascharak, S., Chinta, M. S., Wan, D. C., & Longaker, M. T. (2019). The Spectrum of Scarring in Craniofacial Wound Repair. *Frontiers in Physiology*, *10*, 322. Retrieved from <https://www.frontiersin.org/article/10.3389/fphys.2019.00322>
- Jessen, K. R., & Mirsky, R. (2019). The Success and Failure of the Schwann Cell Response to Nerve Injury. *Frontiers in Cellular Neuroscience*, *13*, 33. Retrieved from <https://www.frontiersin.org/article/10.3389/fncel.2019.00033>