

ProRegem Research Proposal

Title: Is there efficient brain repair in the african spiny mouse?

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Summary

Regeneration is a remarkable feature of some animals, such as planarians, zebrafish and salamanders, among others. Mammals in general do not regenerate after tissue injury, but rather form scar tissue after wound closing. A rare and notable exception is the african spiny mouse (*Acomys cahirinus*), which is capable of non-fibrotic regeneration of extensive dermal wounds, as well as closing ear wounds. Such regeneration is produced by highly proliferative cells that are able to reconstitute the original tissue structure and achieve full wound closing without scarring, including cartilage, dermis, epidermis, adipose tissue, glands and hair follicles (Gawriluck et al, 2016; Santos et al, 2016). While the skin is an organ that is able to undergo reasonable repair, even if with fibrotic scarring, it is unknown whether this species is also able to regenerate tissues that are more difficult to repair, namely in the nervous system.

Our main goals are a) to understand whether the adult *Acomys* brain has neurogenic plasticity, b) which are the neurogenic niches, c) is injury able to stimulate neurogenesis d) is injury able to induce neurogenesis in non-niche locations, e) is this injury-induced neurogenesis efficient in repairing the brain, f) what are the mechanisms behind the regenerative ability in the brain of the african spiny mouse.