

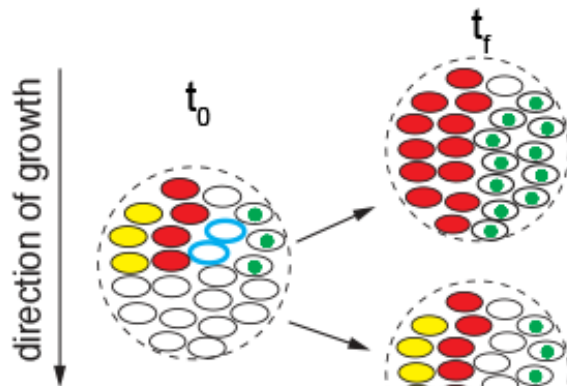


International PhD student opportunity - Australian Regenerative Medicine Institute. Monash University

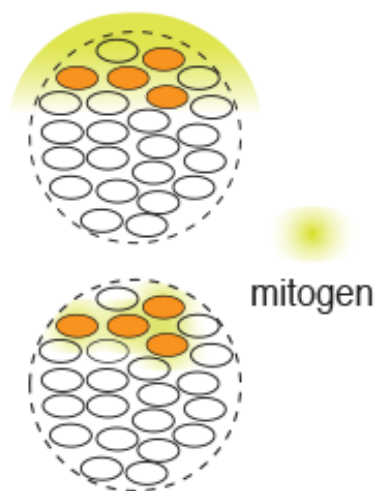
Studying the clonal dynamics of cartilage stem cells during normal and perturbed bone growth

- Looking for an international PhD applicant to be enrolled in Monash University doctoral program under the supervision of Dr **Alberto Rosello-Diez** (<http://www.rosellodiezlab.com> and <https://www.armi.org.au/research-leadership/rosello-diez-group>).
- Long bones grow by forming a cartilage template that provides a scaffold to be replaced by mineralised bone. The production and replacement of cartilage has to be perfectly balanced in order to sustain growth, but the identity and regulatory logic of the cells involved is not clear. Certain perturbations of this process are promptly compensated, providing a means to study the process (see <https://journals.plos.org/plosbiology/article/comments?id=10.1371/journal.pbio.2005086>).

Random loss vs. perdurance of clones derived from stem cells



Extrinsic vs Intrinsic control



- We will use sophisticated mouse models to perform multi-colour lineage tracing of cartilage cells and surrounding tissues in embryonic long bones, in order to: 1) Determine the clonal dynamics of cartilage cells surrounding tissues during normal and perturbed bone growth; 2) Ablate or arrest those cells and study the effect on clonal distribution.

- We will study 4 possible scenarios, arising from the combinations of 2 modes of regulation:

- a) Asymmetric division is controlled at the population level (leading to random loss of some clones) vs. at the individual cell level (clones perdure over time).
- b) Control by extrinsic vs. intrinsic signals

- Part of the project involves modelling of clone behaviour in collaboration with BD Simons (U. of Cambridge) http://www.tcm.phy.cam.ac.uk/~bds10/dir/research_bio.html
- Motivated students are encouraged to contact alberto.rosellodiez@monash.edu. A first-author paper and good English level (IELTS \geq 6.5) are highly recommended in order to get a Monash scholarship (deadline end of March).