

CDB SEMINAR

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Differentiation leads to neighboring cell division in the epidermal stem cell pool

Summary

Adult tissues undergo rapid turnover as mature cells are continuously lost and new cells arise through cell division. The balance between the gain and loss of cells must be finely orchestrated to maintain tissues, but how this balance is achieved remains largely unknown. Previous works [1] have used universal scaling laws to claim that the fate choice of stem cells (division or differentiation) are made strictly cell-autonomously. However, we recently recorded every stem cell fate choice within the mouse skin epidermal regions over one week and found that, far from being cell-autonomous, stem cell loss by differentiation is compensated by direct neighboring division [2].

In this talk, I will give a short review of the previous works on skin homeostasis, and explain how our recent result is consistent with and goes one step further from the clonal tracing experiments. I will then explain the statistical analysis we used in order to make the distinction between the cell-autonomous model and the fate-coordinated model.

[1] E. Clayton et al., Nature 446, 185 (2007) [2] K. Mesa, K. Kawaguchi et al., bioRxiv:155408 (2017).

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