



REGIONAL CENTRE FOR BIOTECHNOLOGY
Journal Club

**“The Par3-like polarity protein Par3L is essential for
mammary stem cell maintenance”**
Nature Cell Biology, 2014; DOI: 10.1038/ncb2969; 1-10

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Abstract

The Par polarity proteins play key roles in asymmetric division of *Drosophila melanogaster* stem cells; however, whether the same mechanisms control stem cells in mammals is controversial. Although necessary for mammary gland morphogenesis, Par3 is not essential for mammary stem cell function. We discovered that, instead, a previously uncharacterized protein, Par3-like (Par3L), is vital for mammary gland stem cell maintenance. Par3L function has been mysterious because, unlike Par3, it does not interact with atypical protein kinase C or the Par6 polarity protein. We found that Par3L is expressed by multipotent stem cells in the terminal end buds of murine mammary glands. Ablation of Par3L resulted in rapid and profound stem cell loss. Unexpectedly, Par3L, but not Par3, binds to the tumour suppressor protein Lkb1 and inhibits its kinase activity. This interaction is key for the function of Par3L in mammary stem cell maintenance. Our data reveal insights into a link between cell polarity proteins and stem cell survival, and uncover a biological function for Par3L.
