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► **COVER:** 'Not a creature was stirring' by Simon Bradbrook, inspired by the articles on p193 and p201. Like a hibernating dormouse, stem cells and memory cells can stay 'sleeping' in bone marrow niches.



LUCY BIRD



KIRSTY MINTON



OLIVE LEAVY



YVONNE BORDON

The bone marrow could be considered to be the immune system's safe house — being a secure location, suitable for lying low and staying out of harms way. Indeed, haematopoietic stem cells (HSCs) can safely lie dormant in specialized bone marrow niches, being aroused from their slumber to replenish blood cells only in times of need. In the Opinion article on page 201, Andreas Trumpp and colleagues propose that leukaemic stem cells similarly hide out in dormant niches and suggest that to make these cells susceptible to chemotherapeutic agents they must first be forced out of the bone marrow niches using factors such as interferon- α , granulocyte colony-stimulating factor and arsenic trioxide.

The bone marrow also seems to be the resting place of choice for long-lived memory lymphocytes. As discussed in the Review on page 193, the bone marrow stroma provides not only a supporting framework but also survival signals to ensure maintenance of resting memory lymphocytes. Competition for a place in these survival niches is therefore thought to regulate the size of the memory cell pools.

In contrast to their sheltered bone marrow counterparts, intestinal immune cells must contend with trillions of commensal bacteria and potential pathogens. Preventing the extensive commensal microbiota from invading deeper into the body requires significant effort and numerous adaptations by the immune system. Lora Hooper and Andrew Macpherson (page 159) describe the three layers of immune protection that are key to confining bacteria to the gut lumen and preventing systemic invasion.

Finally, we would like to draw your attention to a Poster on regulatory T cells that accompanies this issue and is freely available at <http://www.nature.com/nri/posters/tregcells/index.html>, thanks to support from StemCell Technologies.

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