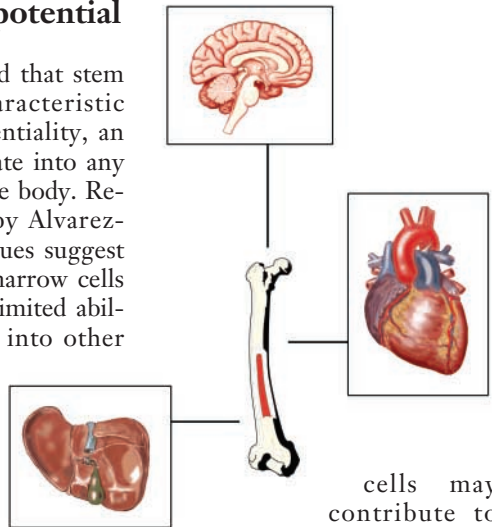


## Bone marrow potential

It is well recognized that stem cells possess a characteristic known as pluripotentiality, an ability to differentiate into any cell line found in the body. Recent experiments by Alvarez-Dolado and colleagues suggest that mature bone marrow cells may also possess a limited ability to differentiate into other cell lines.

The investigators first cultured mice bone marrow cells together with neurons in vitro and found by electron microscopy that a small proportion of the 2 cell lines had fused. To confirm the finding in vivo, the investigators irradiated mice to destroy their existing bone marrow. They then performed allogeneic transplantation of bone marrow that would express detectable markers. At 2 and 4 months after transplantation the marked cells were found to have fused with neurons, hepatocytes and cardiomyocytes.

These findings may shed light on the physiology of end organ cell development and maintenance. No marrow cells were found in skeletal muscle or in lung, gut or kidney tissue. Whether only certain cell lines fuse with marrow cells, or whether fusion occurs only in specific conditions is not known. However, that bone marrow



cells may contribute to the *de novo* generation of brain, liver or heart cells is a fascinating notion that one day may have clinical implications. (Alvarez-Dolado et al. *Nature* 2003;425:968)

## Platelet shelf-life

Unlike red blood cells, transfused platelets do not circulate if refrigerated and need to be stored at room temperature. However, storage at room temperature causes a gradual loss of hemostatic function and increases the risk of bacterial growth. Thus, the shelf life of platelets is only 5 days, causing chronic shortages in blood banks.

Hoffmeister and colleagues have previously shown that cooling irreversibly reorganizes the von Willebrand factor (vWF)

receptor, a crucial component of platelet aggregation. The altered vWF receptor is recognized by circulating macrophages, which then consume the platelets by phagocytosis.

These authors have since identified the specific area on the reorganized vWF receptor that is recognized by macrophages. They postulated that if the receptor could be further altered, perhaps the platelets could be hidden from macrophages and thus preserved. Any alteration, however, could then interfere with the receptor's normal function. After evaluating its molecular structure, they deduced that the site would bind to the simple sugar, galactose.

In the experiments that followed, the authors revealed that adding galactose to chilled platelets prevented their recognition by macrophages while preserving their function for up to 12 days of cold storage. Their findings suggest a simple means of prolonging the shelf life of platelets, preventing bacterial growth in stored platelets, and improving the inventory of this potentially life-saving blood product. (Hoffmeister KM et al. *Science* 2003;301:1531)

— Compiled by *Stephen Choi*



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