Preserving Deposited Extracellular Matrix while Harvesting Cells
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Introduction
The role of cultureware surfaces in preserving the extracellular integrity of a culture, as well as the application of preserved extracellular integrity in cell analysis and tissue engineering, will be described here. A new method for harvesting cells upon a simple change in temperature that does not destroy the extra cellular integrity will be presented together with examples of applications of this harvesting technique within cell analysis and scaffold-free tissue engineering.

Materials and Methods
Thermo Scientific UpCell cultureware has poly(Nisopropylacrylamide, covalently immobilized to the polystyrene surface. The PIPAAm layer is relatively hydrophobic at 37°C, allowing cells to attach and grow. When the temperature of the culture is reduced to below 32°C, the PIPAAm layer becomes very hydrophilic resulting in the release of adherent cells with their underlying extra-cellular matrix from the cultureware (Figure 1). Comparative flow cytometry analysis of the integrity of CD140a receptor on human bone marrow cells and preadipocytes harvested from the UpCell surface and from traditional cultureware and its application for harvesting contiguous cell sheets in tissue engineering are described.

Results
In order to employ the extracellular integrity of a cell culture in sub-cultures or cell analysis, a method for harvesting cells that does not destroy the extracellular integrity must be used (Okano et al., 1993). The new Thermo Scientific Nunc UpCell™ Surface supports cultivation of adherent cells and enables cell harvesting without using enzymes and scraping. The surface responds to a change in temperature, and releases cells with their underlying extracellular matrix upon a reduction in temperature to below 32°C (Figure 1).

Discussion and Conclusions
Cells and cell sheets can be harvested without enzymatic digestion using the temperature-responsive UpCell Surface, enabling cell scientists to preserve cell deposited Extracellular matrix and cell surface receptors for:
- cell analysis and purification, working with antigens and markers in the cell membrane
- cell transplantation, where intact cell surface receptors on donor cells may be needed for them to promptly respond to cues in the graft environment
- the creation of 3D tissue models and transplants without the use of exogenous scaffold materials

References