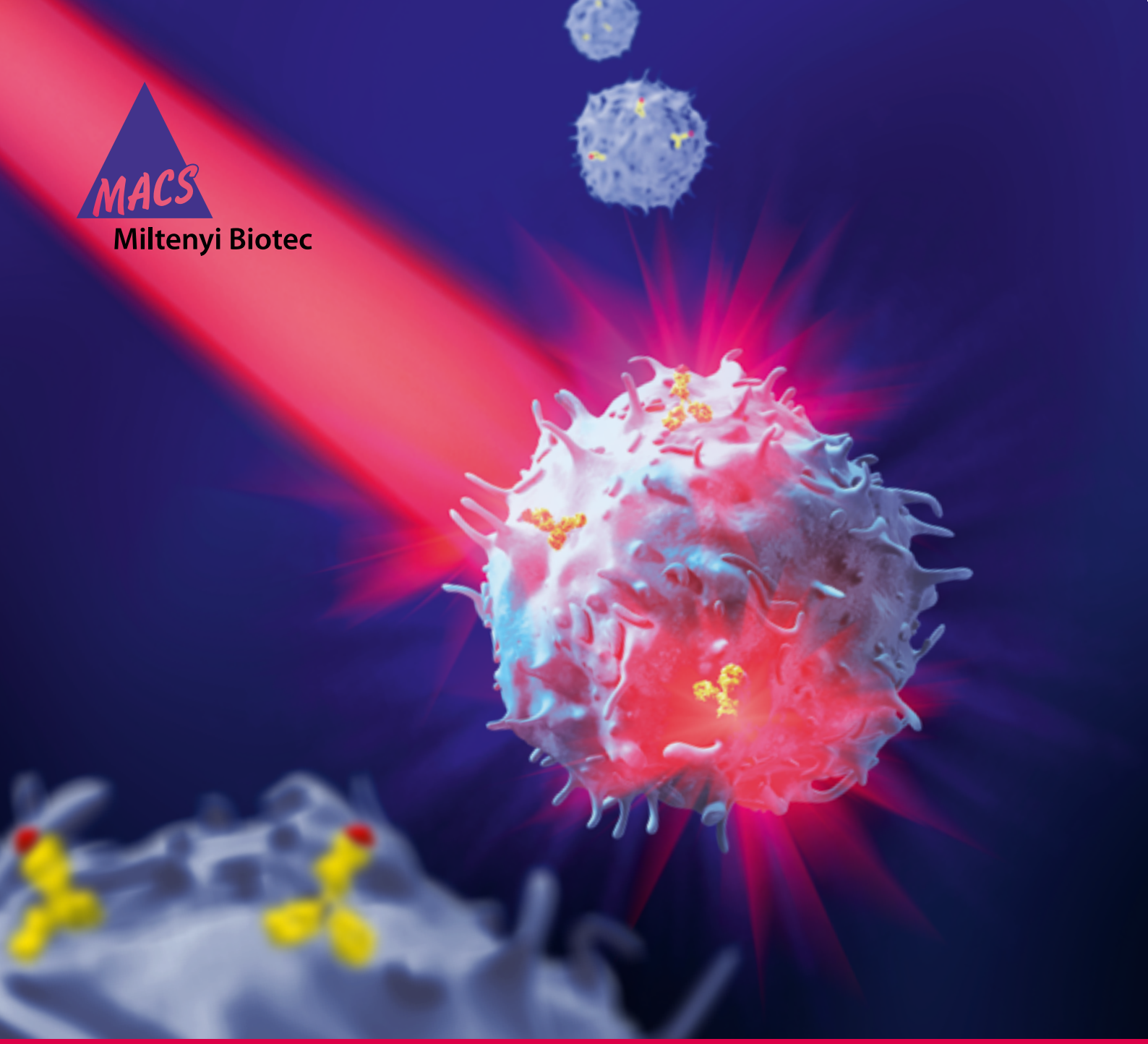

MSC Enumeration Kit, human

Standardized, fast quantification of human mesenchymal stem cells

The MSC Enumeration Kit allows the highly reliable quantification of human mesenchymal stem cells (MSCs) from bone marrow aspirates and other sources by flow cytometry in less than an hour. It contains pre-titrated, ready-to-use antibody cocktails as well as isotype controls for the straightforward, accurate enumeration of MSCs.

- **Fast and easy quantification of MSCs**
- **Pre-titrated ready-to-use antibody cocktail including all control reagents**
- **Strong correlation between flow cytometry–based enumeration and cell culture assay**

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The fast track for MSC quantification

Currently, the colony-forming–unit fibroblast (CFU-F) assay is the most commonly used method to quantify MSCs. However, this cell culture–based technique is time consuming and the results vary greatly between users. A close linear relationship between the number of CFU-F colonies counted manually after 14 days of culture and the number of CD271^{bright} cells in bone marrow aspirate has been described.[1] Another study has shown that among bone marrow cells only CD271^{bright} cells also express MSCA-1$^+$ (W8B2).[2] Based on these two cell surface markers, the MSC Enumeration Kit enables the fast and reliable quantification of MSCs by flow cytometry.

Determine MSC numbers in bone marrow samples accurately

The MSC Enumeration Kit provides highly consistent results from experiment to experiment. Multiple measurements performed with a single bone marrow aspirate sample demonstrate the high sensitivity and accuracy of the flow cytometry analysis (fig. 1).

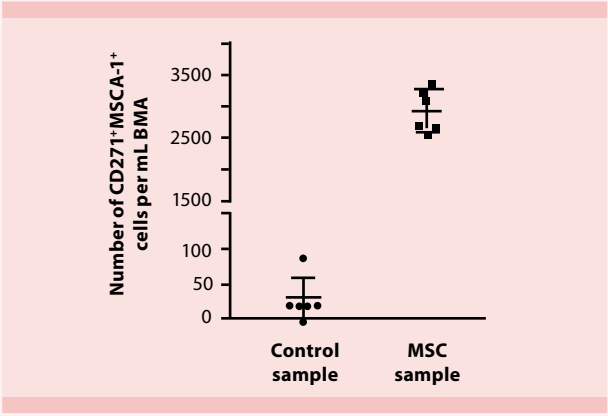

Figure 1: Evaluation of experimental variation for the enumeration of CD271$^+$MSCA-1$^+$ MSCs. The numbers of CD271$^+$MSCA-1$^+$ cells in the MSC sample (stained with MSC Staining Cocktail) and control sample (stained with MSC Control Cocktail) were calculated for one milliliter of bone marrow aspirate (BMA) in six parallel experiments with a sample from a single donor.

Estimate the clonogenic potential of MSCs in less than an hour

Figure 2 shows that the numbers of CD271$^+$MSCA-1$^+$ MSCs contained in bone marrow samples, determined by flow cytometry, correlate well with the numbers of CFU-F colonies derived from these samples. The numbers of CD271$^+$MSCA-1$^+$ cells can therefore provide an indirect estimate for the cells' clonogenic potential. The flow cytometry–based assay saves valuable time as it takes less than an hour to complete, in contrast to the CFU-F assay, which takes days or even weeks.

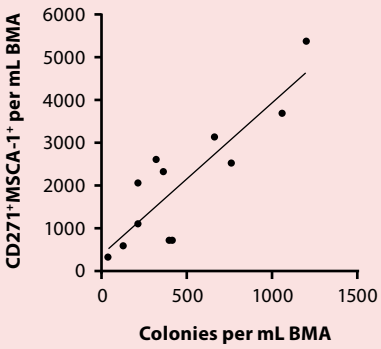

Figure 2: Correlation between numbers of CD271$^+$MSCA-1$^+$ cells determined by flow cytometry and numbers of CFU-F colonies. Bone marrow cells from 12 different samples were cultivated in 6-well plates (4×10^5 cells per well) using StemMACS™ MSC Expansion Media Kit XF. The medium was replaced with fresh medium after 48 h and colonies were counted after 11 days. In addition, CD271$^+$MSCA-1$^+$ cells were quantified in the initial bone marrow samples by flow cytometry using the MSC Enumeration Kit.

Product	Volume/capacity	Order no.
MSC Enumeration Kit, human	25 Tests	130-106-646
StemMACS MSC Expansion Media Kit XF, human	500 mL	130-104-182
CD271 MicroBead Kit, human	100 separations	130-099-023
MSC Phenotyping Kit, human	50 tests	130-095-198
MSC Suppression Inspector, human	2.5 mL	130-096-207
StemMACS AdipoDiff Media, human	100 mL	130-091-677
StemMACS OsteoDiff Media, human	100 mL	130-091-678
StemMACS ChondroDiff Media, human	100 mL	130-091-679
StemMACS MSC Expansion Media, human	500 mL	130-091-680

References

1. Cuthbert, R. *et al.* (2012) Cytotherapy 14: 431–440.
2. Bühring, H.-J. *et al.* (2007) Ann. N. Y. Acad. Sci. 1106: 262–271.

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