Miltenyi Biotec

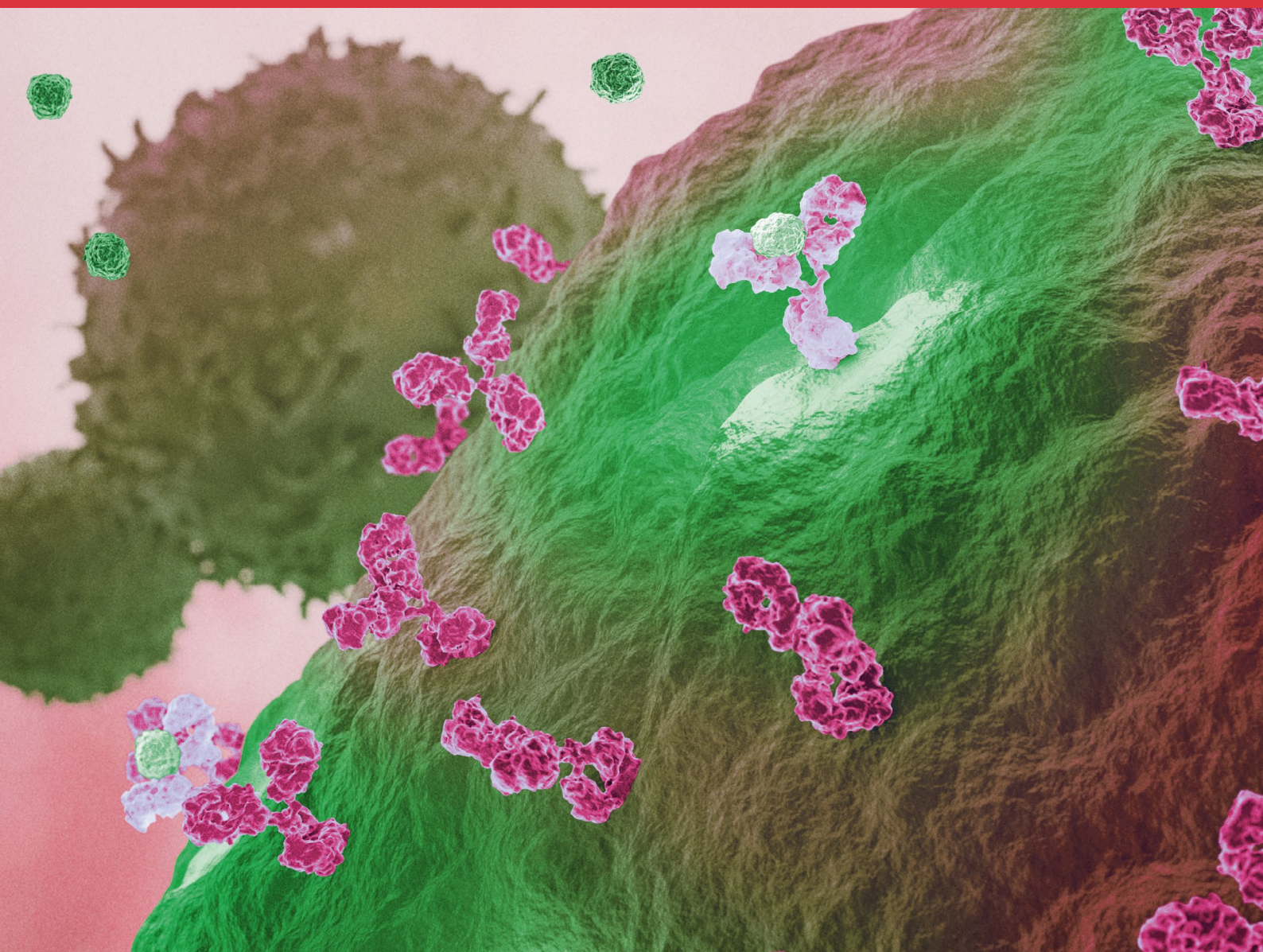
MACS® Premium-Grade Cytokines

Start benefiting from lot-specific cytokine activity now!

To overcome cytokine variability, you could perform lot-to-lot testing. But why should you waste time and money on something we have already done for you? With MACS® Premium-Grade Cytokines we provide you with the specific activity value for each production lot.

- **Time and cost savings: no lot-to-lot testing needed**
- **Reproducible results: apply the same amount of active cytokine every time**
- **Efficient reagent usage: no oversaturation required**

▸ **miltenyibiotec.com/cytokines**



Rely on calibrated cytokine activity for comparable results

Cell culture experiments are always subject to a certain degree of variability. Therefore, calibration with a defined standard is done to normalize results and minimize variability. A reliable way to compare biological activities of products from different vendors is to normalize cellular assays with a defined international standard, e.g., from the National Institute for Biological Standards and Control (NIBSC) (fig. 1).

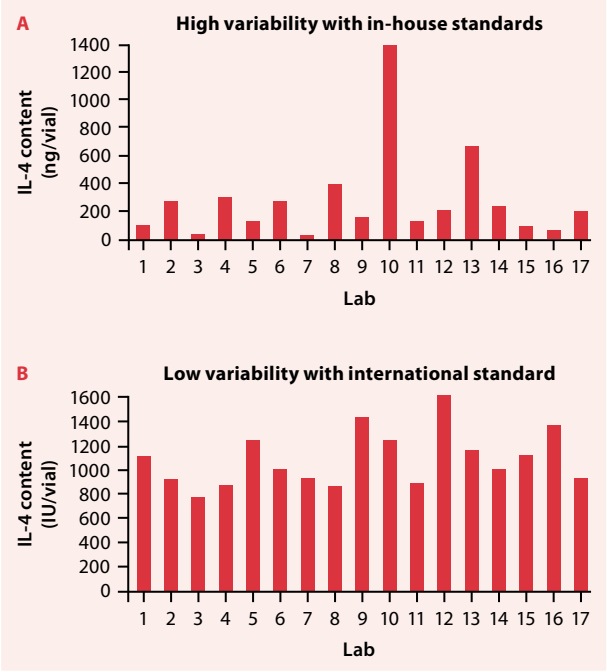


Figure 1: Variability in biological activity of IL-4 strongly depends on the calibration standard used. (A) Results obtained when the participating laboratories used different 'in-house' standards for assay calibration are highly variable. (B) Results obtained by the same laboratories using the WHO International Standard for IL-4 (88/656) to calibrate bioassays in international units (IU) show a lower degree of variability (figure adapted from Thorpe, *et al.* (2000) Cytokine Standardization. The Cytokine Reference. Academic Press, London).

Perform reproducible experiments

Cytokine concentrations in your experiment might differ, as a cytokine's specific biological activity is dependent on the vendor (fig. 2) and even the production lot. With our MACS® Premium-Grade Cytokines we always provide the lot-specific activity value, based on NIBSC standards whenever possible. Therefore, you can apply the same amount of active cytokine in every experiment to be sure that effects are real and not due to variable cytokine concentrations.

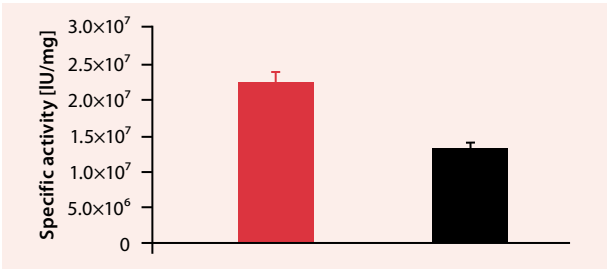


Figure 2: Human GM-CSF biological activity varies between vendors. Miltenyi Biotec's Human GM-CSF, premium grade (red bar) shows higher specific activity than another commercially available product (black bar) when performing a calibrated proliferation assay using TF-1 cells (NIBSC 88/646).

Save cost through efficient reagent use

Due to variable cytokine activity, experiments are often oversaturated. The use of high reagent amounts increases expenses and can affect the cultured cells, which in turn can alter the results of your downstream experiments. With the given lot-specific activity of MACS Premium-Grade Cytokines, you can use precise cytokine concentrations. In this way, you can get closer to natural conditions while using up to ten times less reagent (fig. 3).

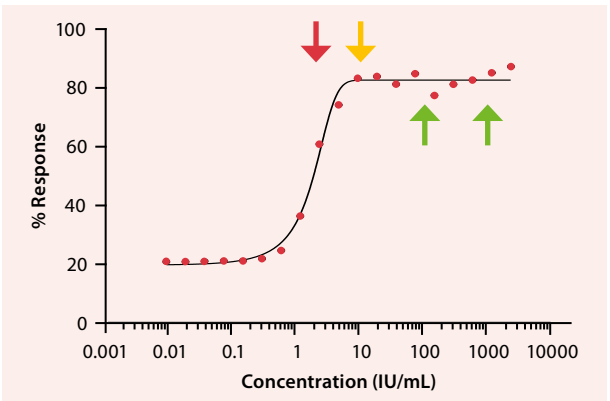


Figure 3: Efficient cytokine usage with specific unit-dosing. Green arrows indicate concentration of cytokine input to reach maximum cellular response. Identical activity can be reached with cytokine concentrations of 100 IU/mL and 1000 IU/mL. Red arrow indicates insufficient cytokine input and the yellow arrow a critical cytokine usage.

VISIT

Find the lot-specific activity on the certificate of analysis:

▸ **miltenyibiotec.com/cytokineCoA**

For seamless transition between basic and clinical research view:

▸ **miltenyibiotec.com/macsgmpcytokines**

Miltenyi Biotec

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