

TECHNOTE – STABILITY STUDIES

Shipment of CellGenix® GMP Media at Ambient Temperatures

As we strive to provide our customers with the highest quality products suitable for clinical *ex vivo* processing of cells, we care greatly about safety and product reliability.

We are able to guarantee our level of quality by performing extensive stability studies for all our media products. To ensure product stability of our CellGenix® GMP DC and CellGenix® GMP SCGM media during shipment we performed dedicated temperature stress tests. In addition to real-time stability studies at +4°C, stress tests at elevated temperatures were performed. Exemplary test results are shown in figure 1 for our CellGenix® GMP SCGM medium.

Test Conditions

Stability of the media after incubation at elevated temperatures was determined by analyzing color, appearance and functionality of the medium. Functionality was measured with the cell-based assays of the respective medium. For the conditions +4°C and +30°C at 72 h the pH and osmolality were tested in addition.

The following temperature conditions were included in the temperature stress tests:

Exposition time	Temperature	Notes
72 h	+30°C	starting temperature of medium bottle at +4°C
48 h	+30°C	starting temperature of medium bottle at +4°C
24 h	+30°C	starting temperature of medium bottle at +4°C
8 h	+40°C	starting temperature of medium bottle at +20°C
1 month	+20°C	controlled room temperature
t=0	+4°C	control medium bottles

Temperature conditions during shipment were determined using temperature monitoring devices placed in our standard CellGenix packaging. These were shipped to different global destinations. Temperatures during shipment never exceeded the temperatures and times applied in the performed stress tests.

Temperatures below 0°C are considered to be uncritical and have therefore not been assessed.



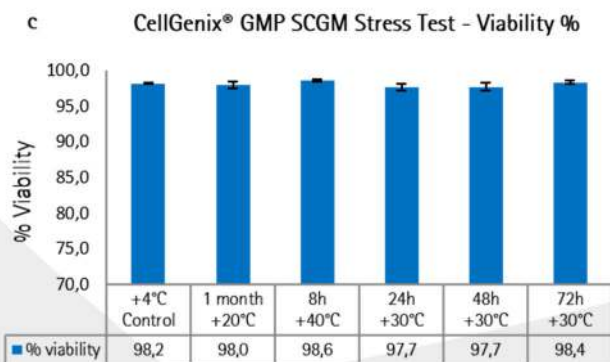
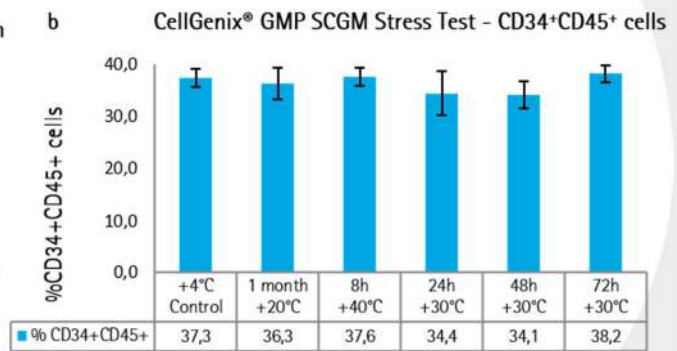
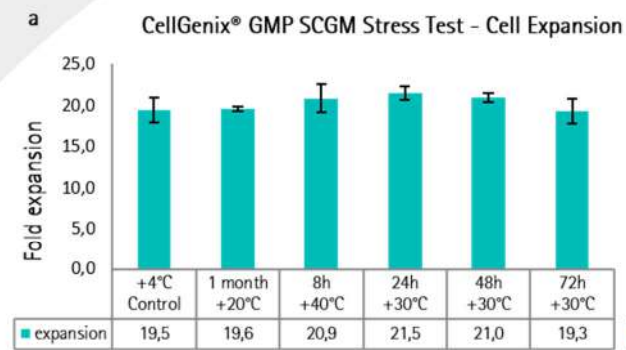


Fig 1: Temperature stress tests performed for CellGenix® GMP SCGM Medium (#0840C) to demonstrate that shipment at ambient temperatures does not compromise the product quality. CellGenix® GMP SCGM was stored under the different conditions listed on page 1. Tests were carried out with PBSC from 3 different donors and mean values were calculated. CD34⁺ cells were cultivated in CellGenix® GMP SCGM with CellGenix® GMP rh IL-3 and CellGenix® GMP rh SCF for 7 days.

a) Cell expansion was determined by counting cells on day 7 based on the number of cells seeded.

b) Ratio of the remaining CD34⁺CD45⁺ cells after 7 days of culturing PBSC was determined by flow cytometry.

c) Cell viability was measured by flow cytometry using 7AAD (7-Aminoactino-mycin).

Conclusion

The product quality of our media is not compromised by shipment at ambient temperatures. The results of the associated stability studies confirm that our standard shipping conditions do not influence the product quality of our CellGenix® GMP Media. Even after shipment at elevated temperatures our media retain a consistent high product quality.

Regulatory Excellence

CellGenix GMP products are based on three major quality standards:

- **Safety** - Safe and qualified raw materials in compliance with our animal-derived component-free and serum-free policy.
- **GMP Compliance** - Manufacturing and quality control following all applicable GMP guidelines to provide documented evidence of purity, potency, consistency and stability.
- **Regulatory Compliance & Support** – GMP products are manufactured, tested, released and distributed under an ISO 9001:2008 certified Quality Management System and allow for the safe use in accordance with USP Chapter <1043> and Ph. Eur. General Chapter 5.2.12. GMP cytokines are tested and released according to USP Chapter <92> as applicable.

We offer expert regulatory and technical support as well as FDA Drug Master Files for most of our products. Customized solutions can be provided to meet special compliance needs.