TERUMO BLOOD AND CELL TECHNOLOGIES

Unlocking Potential

Quantum Flex® Cell Expansion System Small Bioreactor Shows Equivalent MSC Scale-Up Performance to the Standard Bioreactor

With the Quantum Flex® system, adherent cells can be grown on either the standard bioreactor (2.1 m^2 of surface area) or the small bioreactor (approximately 0.2 m^2 of surface area). In this study, mesenchymal stem cells (MSCs) were used to show equivalent expansion kinetics during a 7-day expansion protocol on both the small and standard bioreactors with 99% viability, with an important difference: the small bioreactor required 73% fewer cells to seed and 80% less media for expansion.

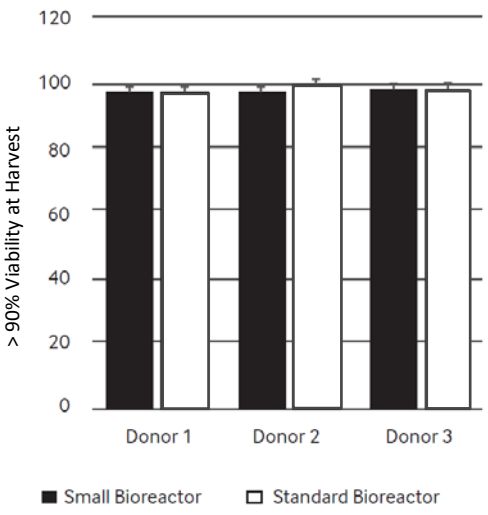
Coat hollow fibers with fibronectin

Seed bioreactors with MSCs from 3 donors

7-day expansion

Harvest cells

	Small Bioreactor	Standard Bioreactor
Cells Seeded	8×10^6	30×10^6
Average Cells Harvested	9×10^7	5×10^8
Average Media Usage	950 mL	4608 mL

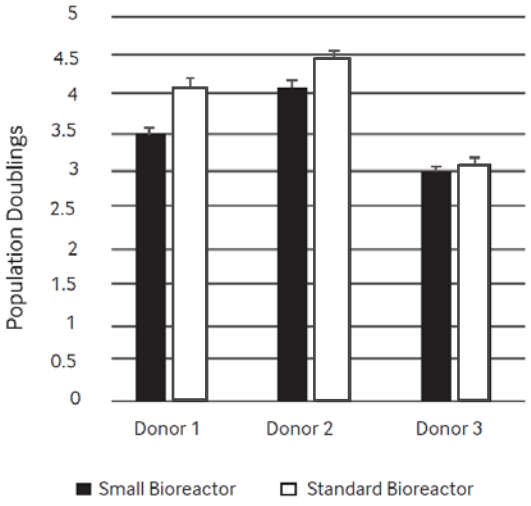


Small bioreactor enables robust expansion:

- High viability of expanded cells: 99% (± 1%) for the small bioreactor and 99% (± 1%) for the standard size — essentially indistinguishable
- No statistically significant difference in population doublings and doubling times between the two bioreactor sizes
- Comparable performance across three different donors

Enable automation earlier in process development:

- Small bioreactor allows cost-effective, automated process development in like-for-like technology as standard bioreactor for scaling up and out
- Identical technology between the two bioreactors avoids the risk and expense associated with changing platforms



Read the white paper