One platform.

From discovery to commercialization. Inspired by human biology. Designed to scale.

The automated, functionally closed **Quantum Flex™ Cell Expansion System** unites biology, automation, and scalability to address current and future challenges — so your process can advance without compromise.

THE CONCERN: Scale can shift biology

- Early processes may fail at scale, adding delays, rework, and cost[1,2]
- Cell quality is affected as processes expand[2]

Quantum Flex is designed to scale and support biological integrity*

- Supports physiological cell expansion by mimicking the body's natural perfusion process[3,4]
- Enables continuous nutrient and gas perfusion while removing metabolic waste[3,4]
- Maintains a controlled, low-shear microenvironment for high-density cell growth through a dual-loop fluidic hollow-fiber design in a single automated bioreactor[3-5]

THE CONCERN: Processes are built without end requirements in mind

- Variability undermines process reproducibility and confidence[2]
- Rigid workflows limit adaptation[6-8]
- As processes change, regulatory complexity increases[6,7]

Quantum Flex helps future-proof manufacturing workflows

- Unifies automation, scalability, and biology to reduce labor and improve consistency[3,11]
- Supports multiple cell types and changing workflows on one purpose-built platform, enabling custom protocols without locking into rigid processes[3]
- Achieves yields in a low harvest volume of less than 1 L[9]
- Facilitates good manufacturing practices (GMP) compliance with FDA 21 CFR Part 11 and EU GMP Annex 11 through automation and cell processing application software[3,6,7,10]
- Offers optional Veda™ Solutions services, including expert process development, workforce training, and maintenance support

*"Biological integrity" refers to key cellular characteristics, including phenotype, viability, and functionality.

Quantum Flex supports

100+ **cell therapy customers** and **15+** **clinical trial programs**

helping teams advance from development to clinical and commercial manufacturing[9]

THE CONCERN: Manufacturing complexities can limit access

- Inefficient processes[1]
- Patients left waiting[2]
- High costs and long manufacturing cycles[1,2]

Quantum Flex simplifies adherent cell manufacturing with microcarrier-free cell expansion

- Considered to be one of the most widely used GMP-compliant bioreactors in automated MSC manufacturing, enabling automated scaling while reducing manufacturing time and costs compared to a manual process[3,9,13*]
- Reduces process complexity while combining large surface area, simple operation, and rapid harvest[5,11]
- Fits up to 2.1 m^2 of surface area into a compact footprint[5,11]
- Enables direct bone marrow seeding, integrating cell isolation and expansion[4,12]
- Rated higher than other technologies for automation of adherent cell-based processes[9†]



May reduce MSC expansion reagent and consumable costs by 49% compared to a manual process[11]

May reduce MSC manufacturing labor by 80% to 90% compared to a manual process[4,9‡]

*Based on market research conducted in 2024. Data on file.
†Based on a 2023 survey. Data on file.
‡In a limited study.

Quantum Flex simplifies cell harvesting with high-density expansion and delivers functional cells with rapid expansion

- Enables an integrated workflow for CAR-T and TCR-T manufacturing[3,9]
- Combines activation, transduction, and expansion through the automated 3-in-1 process[3]
- Produces over 10 billion total cells (including 6.9 billion CAR-T cells) with starting seed from 120 million cells within 7 to 8 days[3,8]

For CAR-T manufacturing:

The 3-in-1 integrated workflow **contributes to a 29% reduction in manufacturing cycle time** compared to manual workflows[3,9,11*]

Can reduce open events to **13**, and potentially to only **3**, helping to **minimize contamination risk**[3,5,13*]

The 3-in-1 integrated workflow **offers nearly 2x the transduction efficiency** compared to manual workflows[3*]

*In a limited study.



Discover how the Quantum Flex™ Cell Expansion System

can help advance your process and scalability needs



- Designed to scale and support physiological cell expansion[3,4,11]
- Helps future-proof manufacturing workflows[3]
- Simplifies adherent and suspension cell manufacturing[3,5]

Scan to learn more

about the Quantum Flex Cell Expansion System or contact your Terumo Blood and Cell Technologies representative today

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TERUMO BLOOD AND CELL TECHNOLOGIES

Terumo Blood and Cell Technologies is a medical technology company. Our products, software, and services enable customers to collect and prepare blood and cells to help treat challenging diseases and conditions. Our employees around the world believe in the potential of blood and cells to do even more for patients than they do today. **TerumoBCT.com**

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