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FUJIFILM Biosciences

Achieve a New Level of Viral Vector Productivity

BalanCD HEK293 Perfusion A

Engineered for high performance of HEK293 cells in perfusion and intensified processes

Accelerate Development of Gene Therapies

Overcome production limitations in your viral vector process and maximize performance with BalanCD HEK293 Perfusion A medium. Meticulously engineered for high cell densities, broad scalability, and consistency—this chemically defined formulation sets you up for longstanding therapeutic success.

Unparalleled Productivity

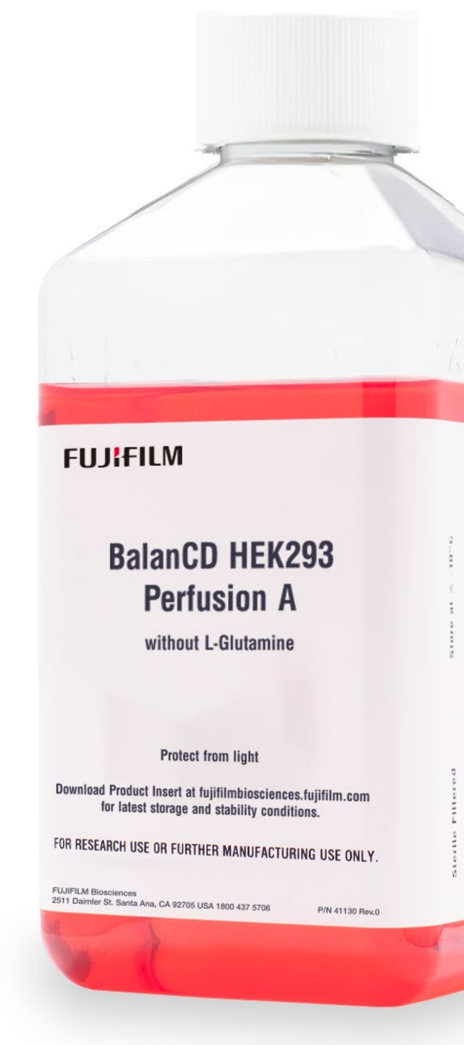
Achieve high cell densities with minimal byproduct accumulation for improved viral vector output

Optimized Media Utilization

Reach cell specific perfusion rate (CSPR) of 25 pL/cell/day to maximize efficiency and reduce operational costs

Enhanced Vector Stability

Support unstable and labile viral vectors with continuous harvest for preserved vector integrity and optimal performance throughout your process



Unlock Higher Productivity for Process Intensification

BalanCD HEK293 Perfusion A is specifically optimized for high cell density (HCD), intensified processes, and perfusion cultures for AAV and LV production, enabling your process to achieve manufacturing capabilities of the future.

Growth and Titer in Batch Mode

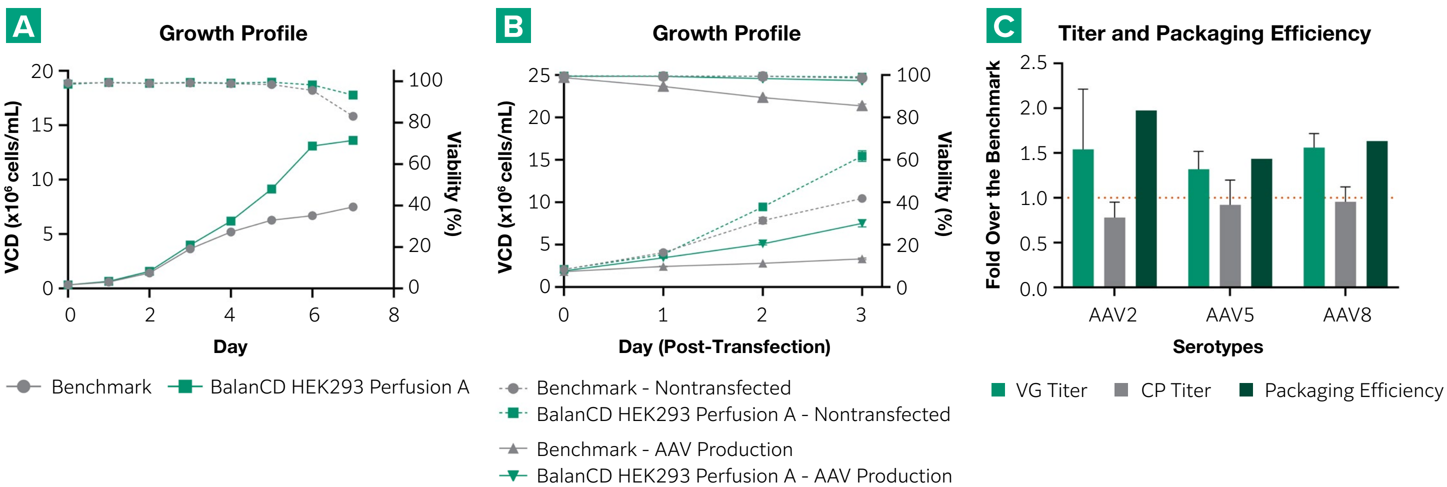


Figure 1. BalanCD HEK293 Perfusion A supports HEK293 cell growth and productivity in batch mode. **(A)** Suspension HEK293 viable cell density (VCD) and viability in 30 mL shake flask, utilizing BalanCD HEK293 Perfusion A or benchmark medium**. (B)** Viability sustained post-transfection in cells grown in BalanCD HEK293 Perfusion A, compared to benchmark control. **(C)** BalanCD HEK293 Perfusion A increases viral titer of AAV2, AAV5, and AAV8 serotypes, over benchmark control.

Process Intensification in HEK293 Perfusion Culture Using ATF Device

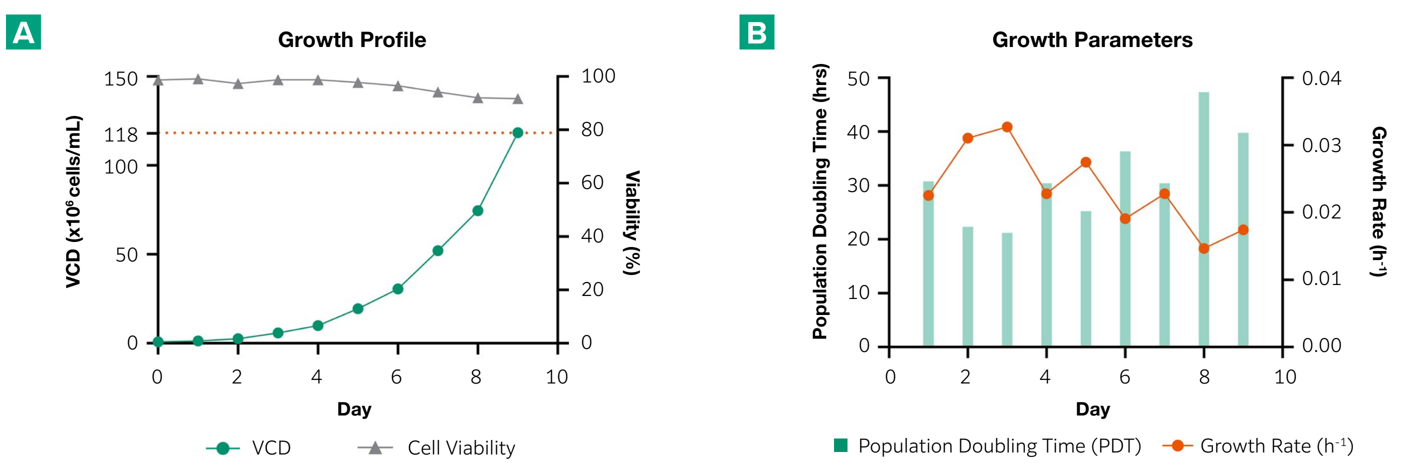


Figure 2. BalanCD HEK293 Perfusion A supports HCD process intensification through perfusion culture. **(A)** Maximum VCD in suspension HEK293 cells cultured in 5 L bioreactor equipped with ATF (alternating tangential flow) device, where culture was maintained at a constant CSPR of 25 pL/cell/day. VCD increases progressively up to the peak VCD of ~1.18 x 10^8 cells/mL at Day 9 post-inoculation. **(B)** Corresponding population doubling time (hours) and specific growth rate (Day^{-1}) during the perfusion culture process. Doubling time increases as the culture progresses, corresponding to the decrease in growth rate and reflecting metabolic changes upon reaching higher cell densities.

Produce More with Less: Optimized for Advanced Perfusion Workflows

BalanCD HEK293 Perfusion A is built for flexibility and reliability across various platforms for viral vector production.

BalanCD HEK293 Perfusion A Supports HCD Transfection and Induction for AAV Production in Perfusion Culture Using ATF Device

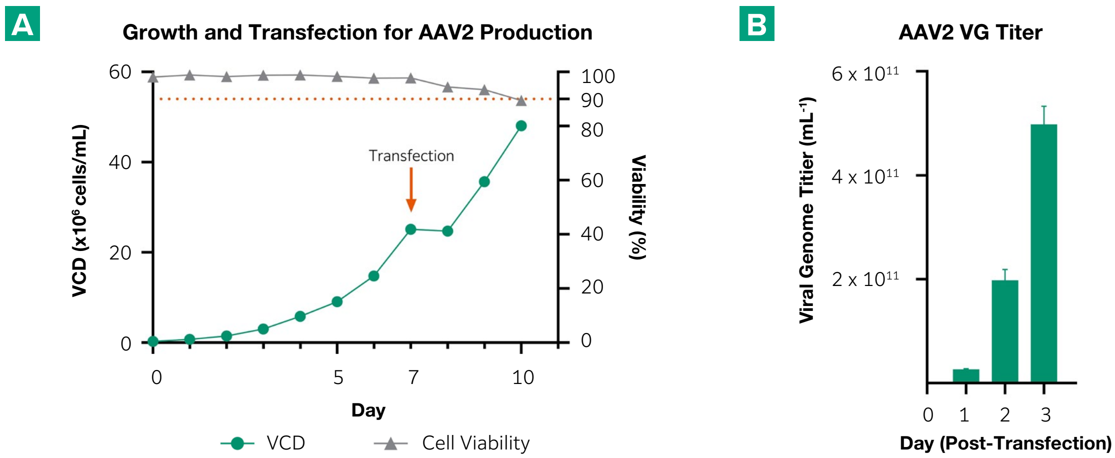


Figure 3. HCD transfection for AAV2 production in 5 L bioreactor equipped with ATF device. Suspension HEK293 cells were cultured in BalanCD HEK293 Perfusion A, maintained at a constant CSPR of 25 pL/cell/day and triple-transfected with AAV2 plasmids using PEI. Cell growth continued up to 4.8 x 10^7 cells/mL with 90% viability at time of harvest **(A)**. AAV2 viral genome (VG) titer was measured daily up to Day 3 post-transfection, reaching 5.0 x 10^{11} VG/mL **(B).**

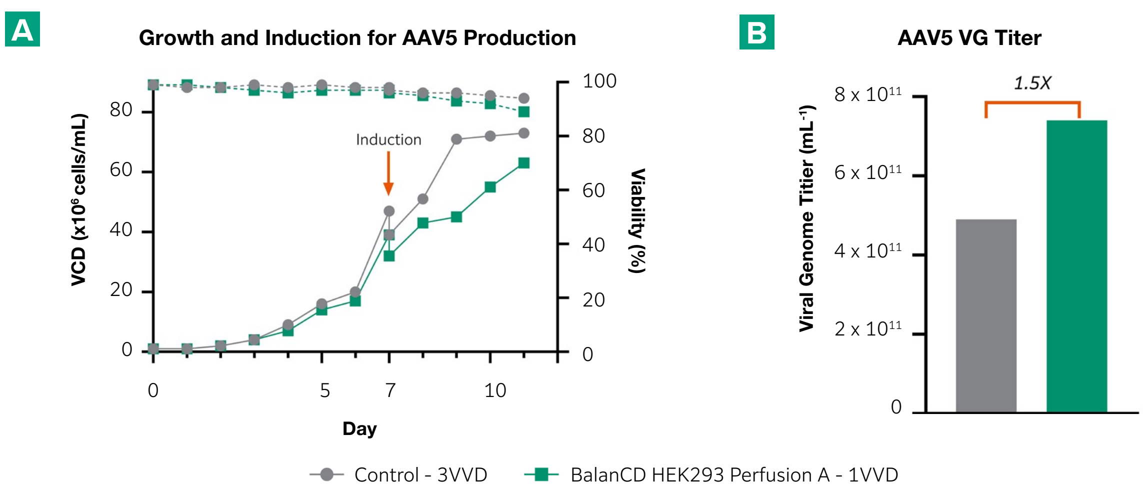


Figure 4. HCD culture induction for AAV5 production in 0.2 L bioreactor equipped with ATF device. Suspension HEK293 cells were cultured in BalanCD HEK293 Perfusion A at 1 VVD (vessel volume per day) or control medium at 3 VVD. When VCD reached 4 x 10^7 cells/mL or higher (on Day 7), doxycycline was added to induce AAV5 production and perfusion culture was continued up to harvest on Day 11. Cell bleeding occurred immediately after induction for using cells in a separate experiment, as indicated by the dip in the VCD curve on Day 7 **(A)**. VG titer was measured at Day 4 post-induction **(B)**.

BalanCD HEK293 Perfusion A Supports HCD Transfection and Induction for LV Production in Perfusion Culture Using TFDF Device

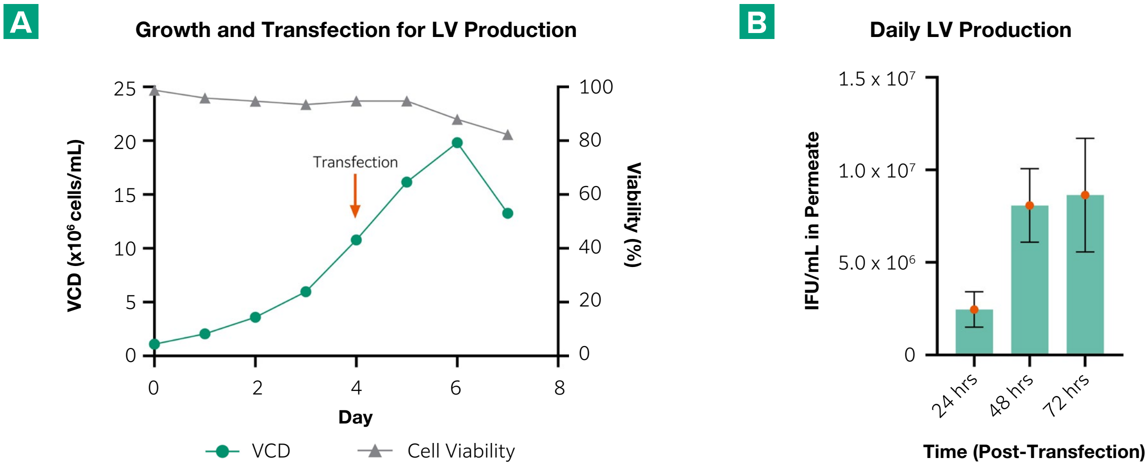


Figure 5. HCD transfection for LV production in a 1 L bioreactor equipped with TFDF (tangential flow depth filtration) device. Suspension HEK293 cells were cultured in BalanCD HEK293 Perfusion A, maintained at a constant CSPR of 25 pL/cell/day and quadruple-transfected with LV plasmids using PEI on Day 4, with VCD and viability measured up to 3 days post-transfection **(A)**. Before emptying out the permeate container, permeate samples were collected daily for IFU titer measurement, showing increased LV production. Cumulative titer reached 5.97 x 10^9 IFU/L in 3 days from 1.2 L culture volume, with total permeate of ~2 L **(B)**.

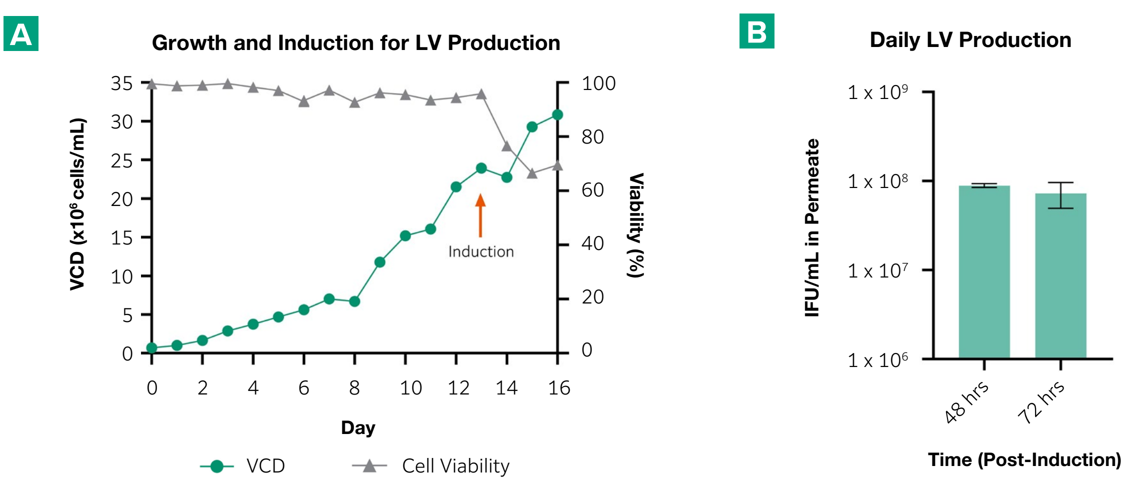


Figure 6. HCD culture induction for LV production in a 1 L bioreactor equipped with TFDF device. Suspension HEK293 cells were cultured in BalanCD HEK293 Perfusion A and maintained at a constant CSPR of 25 pL/cell/day. When VCD reached 2.4 x 10^7 cells/mL (on Day 13), cumate and coumermycin were added to bioreactor for induction, followed by sodium butyrate addition 24 hours post-induction, with induction chemicals continuously perfused in bioreactor for LV production **(A)**. Viral IFU titer was measured from culture permeate. Cumulative titer reached 6.23 x 10^{10} IFU/L in 3 days from 1.2 L culture volume, with total permeate of ~2.8 L **(B)**.

Redefine Productivity for Viral Vector Manufacturing

- **Support both steady-state and intensified** perfusion workflows for process flexibility
- **Improve process efficiency and reduce costs** by achieving higher yields, product quality, and supporting stable, inducible vector systems
- **Ensure batch consistency** to minimize variability and support regulatory compliance
- **Enable seamless scalability** from small-scale systems to large bioreactor operations

Be the Innovator Your Process Deserves

Break free from traditional batch limitations to reach new levels of AAV and LV productivity with BalanCD HEK293 Perfusion A. Visit **fujifilmbiosciences.fujifilm.com/balancd-hek293-perfusion-a** or contact **getinfo@fujifilm.com** today to start transforming your process.

PrimePath

Therapy solutions that evolve with you

Supporting your therapies from discovery to commercialization

To compliment viral vector production workflows with BalanCD HEK293 Perfusion A, PrimePath is a comprehensive solutions portfolio of additional media, reagents, services, and testing to foster innovation at any stage of your therapy development journey.

Global Supply Continuity for Gene Therapy

BalanCD HEK293 Perfusion A is manufactured following GMP using qualified raw materials to ensure continuity of supply and lot-to-lot reliability from our facilities all over the world.

- Stringent raw materials control and sourcing program
- Meets the highest global and regional standards
- Fulfills regulatory demands for each lot
- COA, COO, TSE/BSE statements
- ISO 13485, EN 13485:2016 certified
- Drug Master Files (DMF) supported*

* Available upon request

ORDERING INFORMATION

Product Description	Catalog #	Size*	Additional Information
BalanCD HEK293 Perfusion A (Liquid)	91184	1 L (Bottle) 20 L (Bag)	Chemically defined, animal component-free formula.
BalanCD HEK293 Perfusion A (Powder)	94155	10 L	Chemically defined, animal component-free formula.
Anti-Clumping Supplement	91150	50 mL	Animal component-free formula.

*Custom sizes and packaging available upon request.

Giving *life* to your next breakthrough

FUJIFILM Biosciences is dedicated to empowering you at every stage of discovery, development, and commercialization. By offering a diverse portfolio of cell culture products and services, we are primed to support your breakthroughs and accelerate the creation of life-changing treatments.

Through collaboration, expertise, and consistency, our purpose is being your *Partners for Life*.

Partners for *Life*

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