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Multisizer 4e COULTER COUNTER

Accurate counts for all types of particles — independent of shape, color, or transparency

- Precise and discrete size distributions in number, volume and surface area in one measurement (range: 0.2 μm to 1600 μm)
- Ultra-high resolution, multiple channel analysis and accuracy with the Digital Pulse Processor (DPP)
- Ability to detect small changes in particle/cell size
- Measurement is not affected by particle color, shape, composition or refractive index

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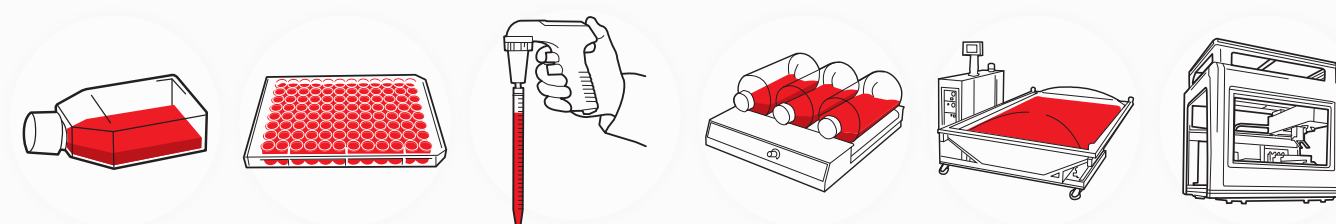
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A Check-up Before you Scale up

Beckman Coulter Life Sciences is dedicated to empowering discovery and scientific breakthroughs. The company's global leadership and world-class service and support deliver sophisticated instrument systems, reagents, and services to life science researchers in academic and commercial laboratories, enabling new discoveries in biology-based research and development.

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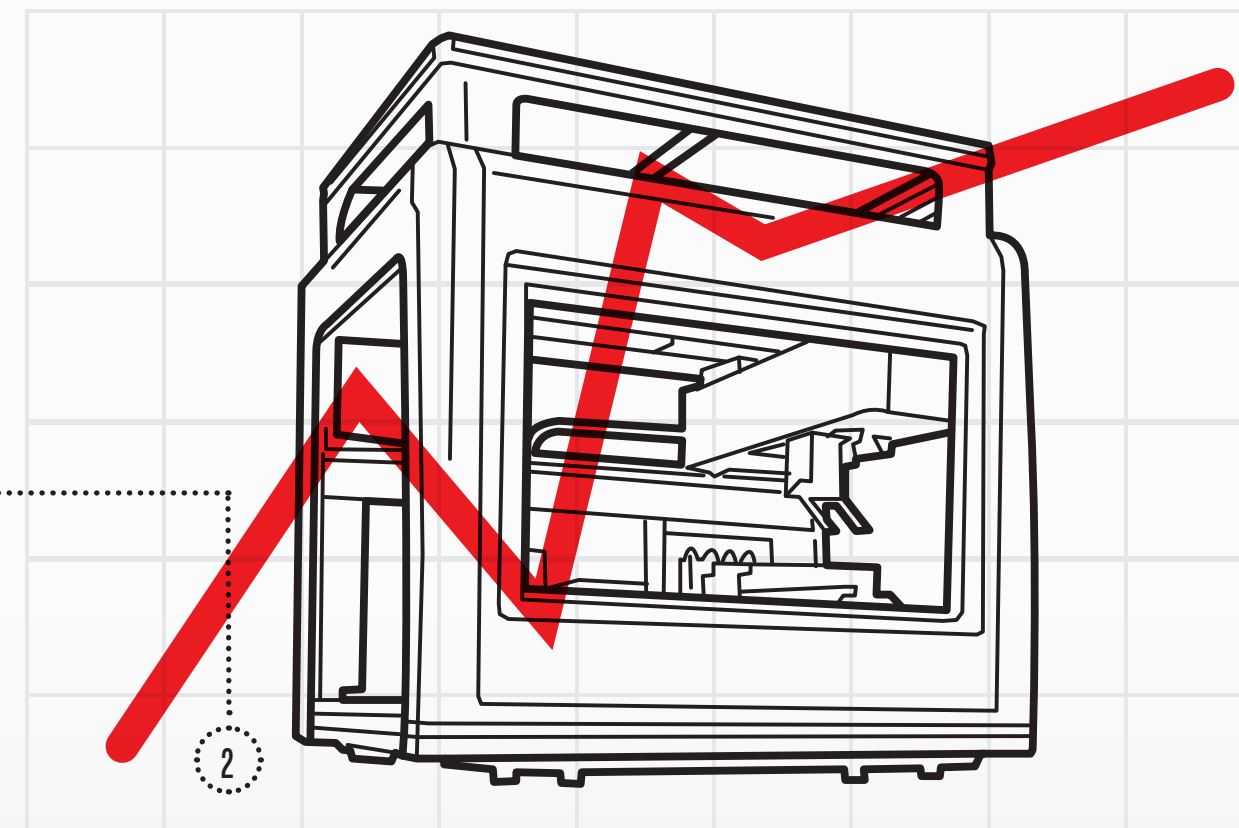


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Cell-Line Engineering: A Check-up Before you Scale up

Bioproduction is a booming industry, with more therapeutics being produced in cell culture than ever before. With increased workflow flexibility, decreased variability, and high product yields, cell-line engineering is here to stay. But before you take your bioproduction to the next level, you'll need to know a bit more about your product, your cells, and their health. It's time for a cell-line engineering check-up!



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CELL COUNTING MADE EASY



Vi-CELL XR Cell Viability Analyzer

Fast, Efficient, Accurate

- 12-position auto sampler, for walk-away sample analysis.
- No dilution required if your samples are within the 50×10^3 to 1×10^7 cells/mL range.
- Customizable cell types allow analysis of many cell species.

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Transfection

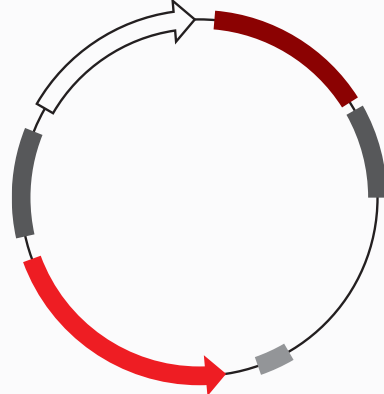
There are several transfection methods available, including electroporation, lipofection, calcium phosphate, polymer-based methods, and viral transduction. Choose one that is optimized for your cell line, vector size, and throughput. Screen for successful, stable transfectants before moving on to optimize your media and culture conditions.

Expression Vector

For optimal expression of your product, choose an expression vector with proven success in your chosen cell line. Ensure that you include the genes encoding your product, strong promoters and enhancers, selection marker(s), and the required equipment for plasmid replication in your cell line of choice.

Selection

Select for cells that have taken up the plasmid by applying selective pressure, either an antibiotic or medium lacking an essential amino acid. Cells that survive will have incorporated both the gene of interest and the selection marker.



Scale UP vs. Scale OUT: Which one is right for my product?

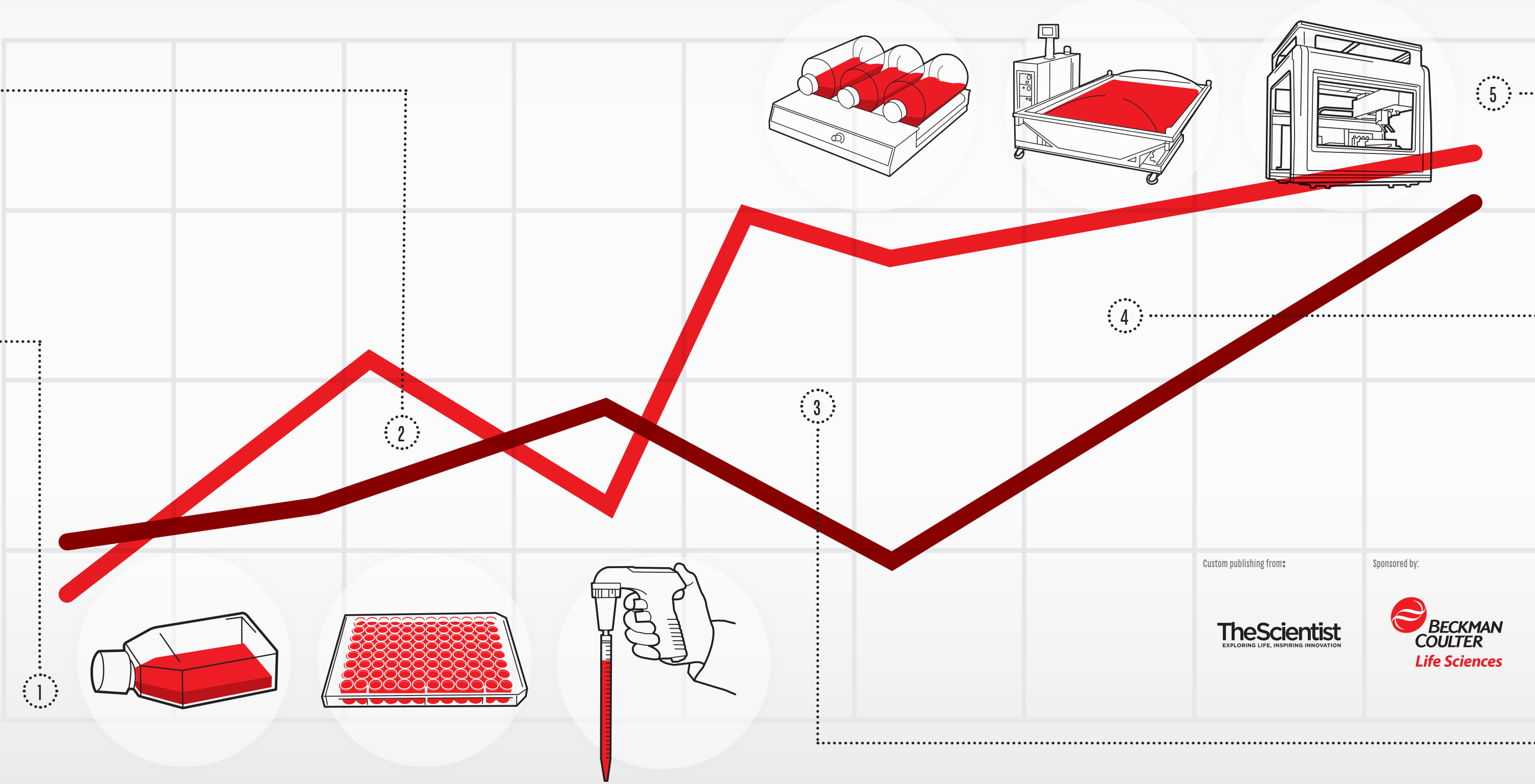
Scale up involves increasing the batch size of your culture, with the end result of increasing the amount of product derived from each batch. Mass-produced drugs are scaled up.

Scale out refers to the process of production on a patient-by-patient basis. Scale out often refers to the bioproduction of autologous cells for cell therapy.



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Cell Viability

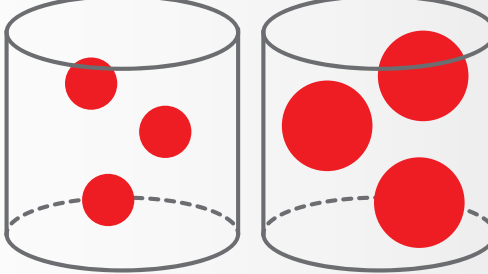
Cell-viability analysis is essential for bioproduction workflows, since dead or dying cells don't only stop producing, but they may introduce proteolytic breakdown products into the culture. For optimal cell-viability analysis during bioproduction, trypan blue dye exclusion is the gold standard method, although other methods, like flow cytometry, can be used to determine the type of cell death.

Cell Volume

The volume of a cell changes throughout protein expression, so cell-volume analysis can provide information on transfection efficiency. One of the most accepted methods to measure cell volume is using the Coulter Principle.

Documenting cell death

Cell death is not a one-size-fits-all process. There are several different paths to cell death, including necrosis, apoptosis, mitotic catastrophe, or failure of autophagy. Knowing which is impacting your culture can help you with preventing the same fate in future batches.



Cell Health

Bioproduction can be stressful for cells, so monitoring cell health throughout the process can help prevent unexpected protein modifications or off-target products. Two common ways to monitor cell health during bioproduction are:

Morphology tracking: Follows changes in cell phenotype throughout bioproduction



Electrochemical tracking: Measures the extracellular changes created by cell activity



Influences

What factors can influence cell health during bioproduction?

- Dissolved CO₂
- pH levels
- Dissolved O₂
- Temperature
- Agitation rate
- Other cellular functions