

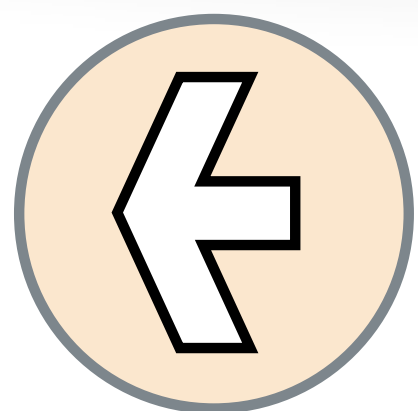


**BECKMAN  
COULTER**

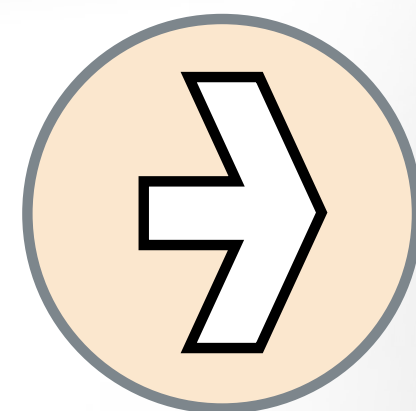
**Life Sciences**

# Automated Solutions for Cell Line Development

Your Guide to Workflow  
Intelligence



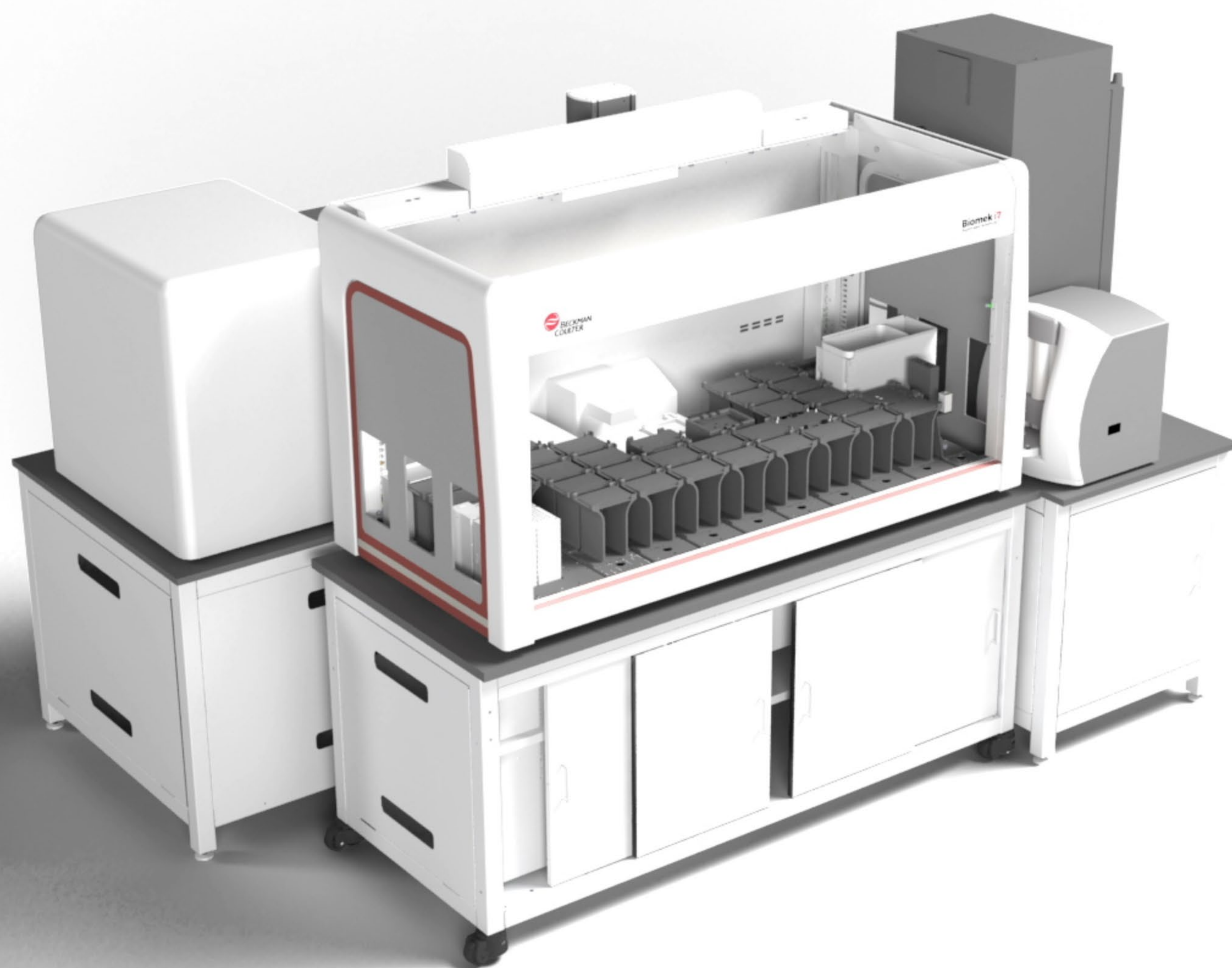
Review our solutions  
by **PRODUCTS**



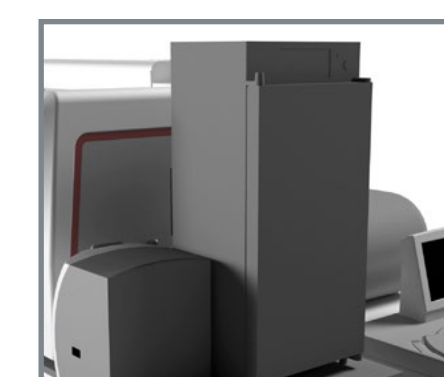
Review our solutions  
by **WORKFLOW**

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# PRODUCT Solutions



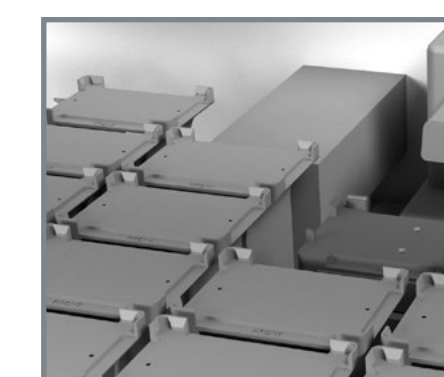
**Biomek i7**



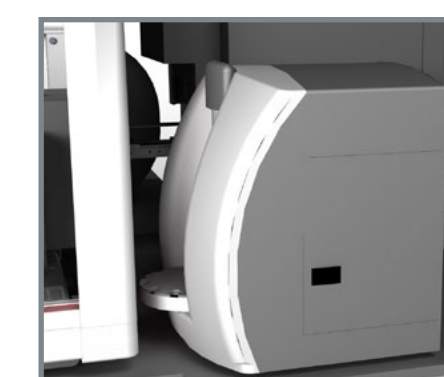
**Incubator**



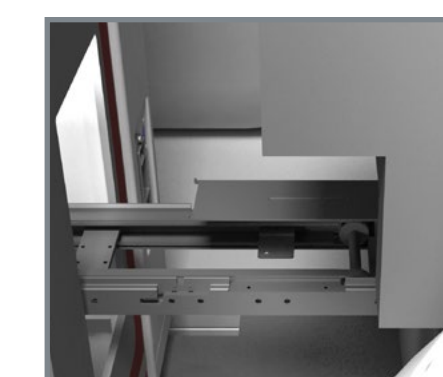
**Capper/  
Decapper**



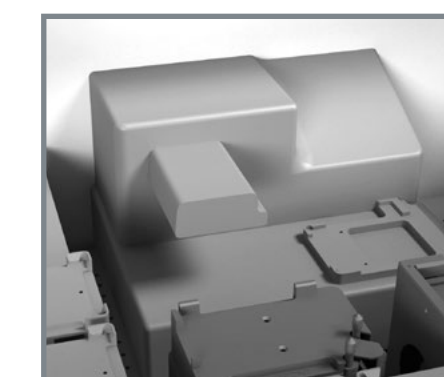
**Orbital Shaker**



**Vi-CELL**



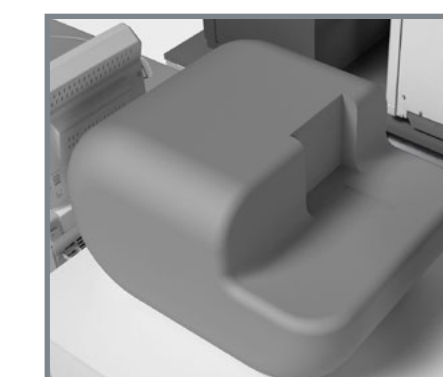
**Robotic  
Shuttle**



**Reagent  
Dispenser**



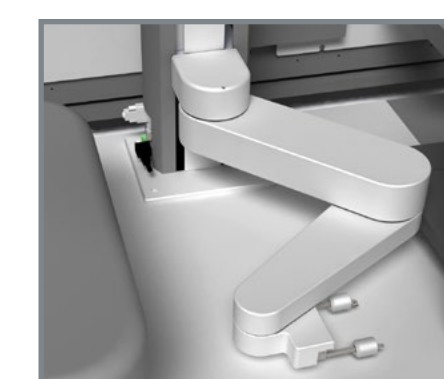
**Octet Systems**



**CloneSelect™  
Imager**



**Automated  
Labware  
Positioners**



**Robotic Arm**



**Avanti JXN  
High-Speed  
Centrifuge**

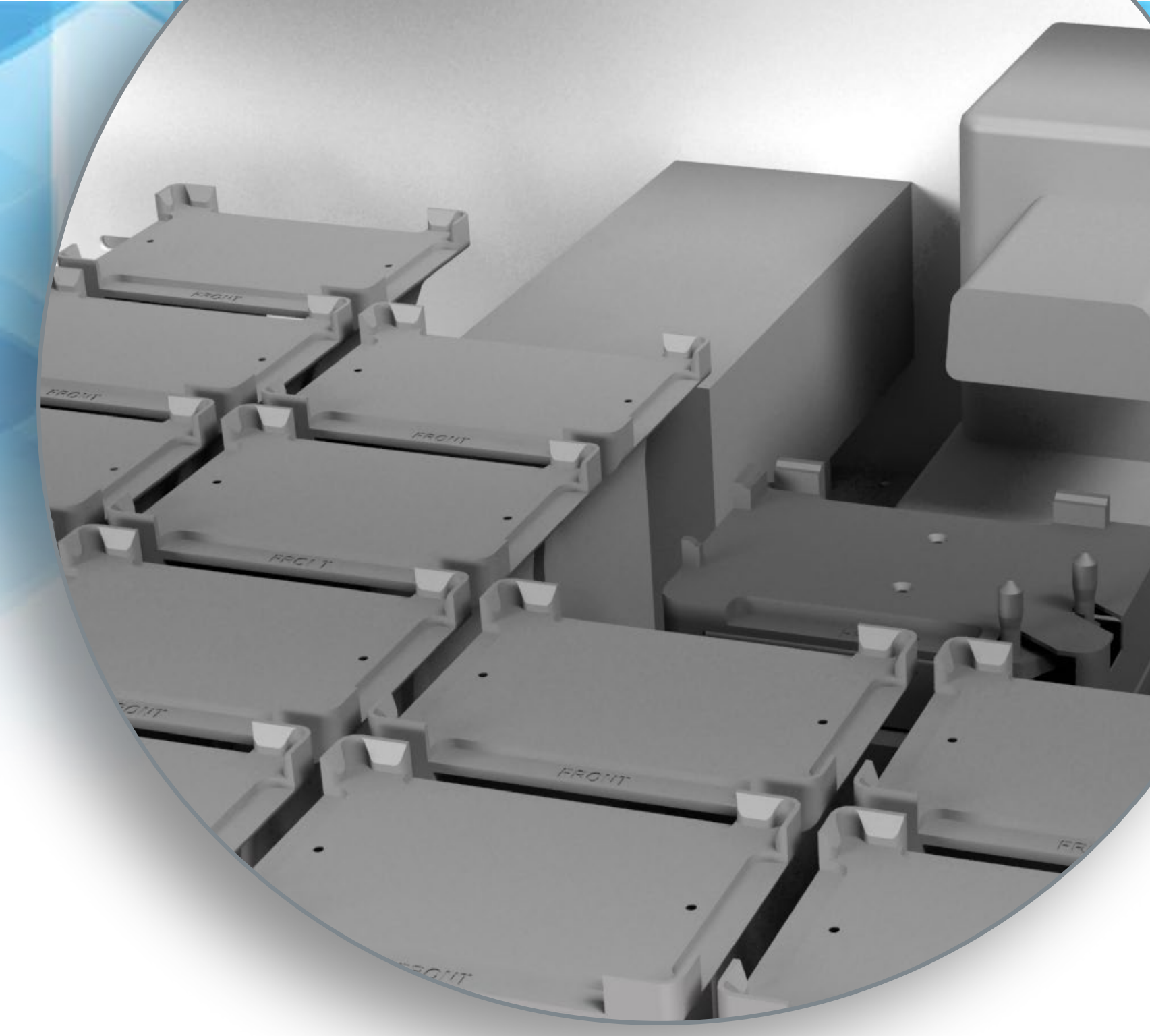


# Biomek i7 Automated Workstation

Improve procedural ELISA, achieve single cell suspension reliably, simplify transfection optimization, and adapt basic cell culture workflows.

- Extend production scale and centralize operations
- Leverage dual-arm pipetting
- Flexibility with reagent and media mixing, and cell passaging and plating
- Improve efficiency by directly integrating required components
- Simplify serial dilutions with built-in spanning transfer system
- Improve analysis efficiency with sample and data tracking\*
- Take control of multi-day planning\*
- Monitor progress with platform status light
- Remote system monitoring using on-deck cameras

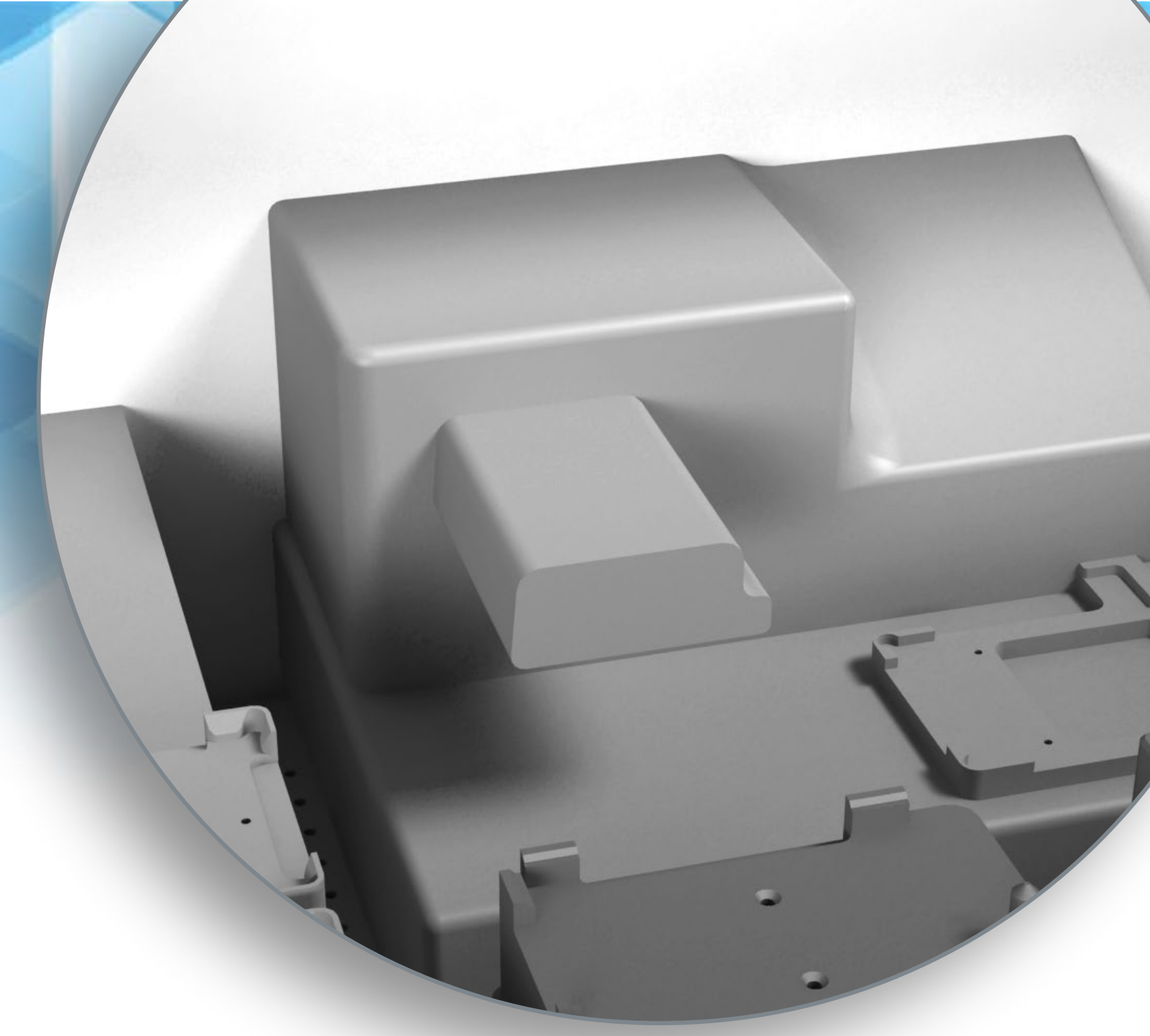
\*Possible through optional software packages DART and SAMI.



# Orbital Shaker

**Promote cell health with user-definable and reliable agitation of microplates, cultured cells, or general vortexing.**

- Smooth and continuous motion, enabling nutrient diffusion without splashing
  - Timed orbital and pulse shaking
- Ramped acceleration/deceleration
  - Shaking speed ranges from 100 rpm to 1800 rpm
- Space saving
- Easily integrated with Biomek i7
  - Increases experimental flexibility



# Reagent Dispensers

**Accelerate assay-specific or maintenance laboratory protocols with automated, precise dispensing. Ensure the accuracy of reagent dispense volumes.**

- Simplify workflows
- Dispense a wide range of volumes
- Minimize contamination
  - Interchangeable dispensing heads available
- Increase accuracy
  - Superior mixing
  - Reduce air bubble formation
- Integrates with Biomek i7
  - Flexibility to configure reagent containers of wide-ranging volumes



# Automated Labware Positioners (ALPs)

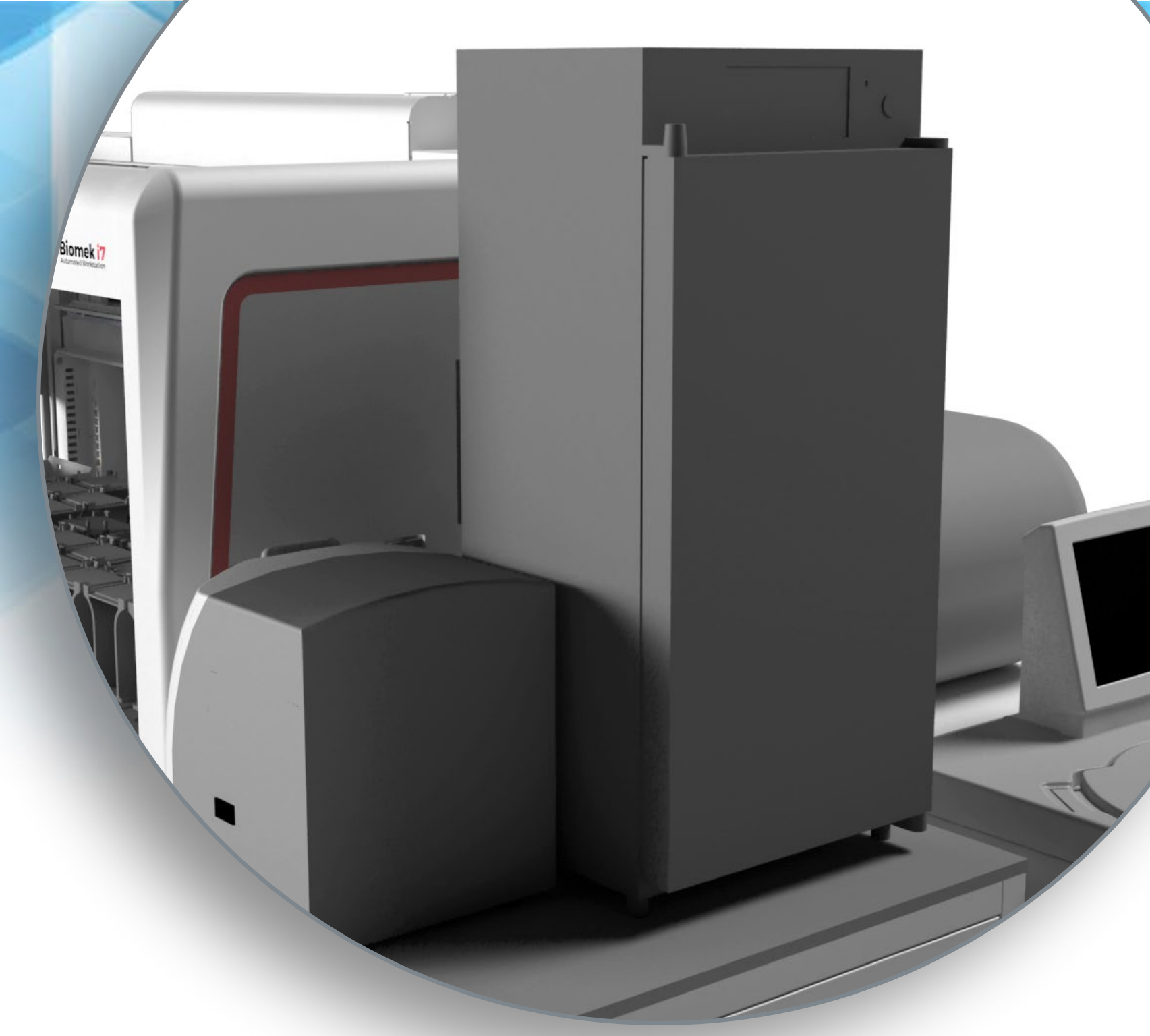
Workstation-integrated and interchangeable components that perform specific tasks. ALPs make it possible to configure the platform for accommodation of a wide range of applications.

## **Peltier**

- Shaking model shakes microplates at speeds ranging from 100 rpm to 1400 rpm
- Temperature control capable

## **Tilting ALP**

- Controlled and gentle media exchange
- Media is removed from edge of well without disturbing adherent cells



# Incubator

**An incubator provides a consistent environment for the housing of growing cell cultures and for the temporary incubation of cells underdoing experimental assays.**

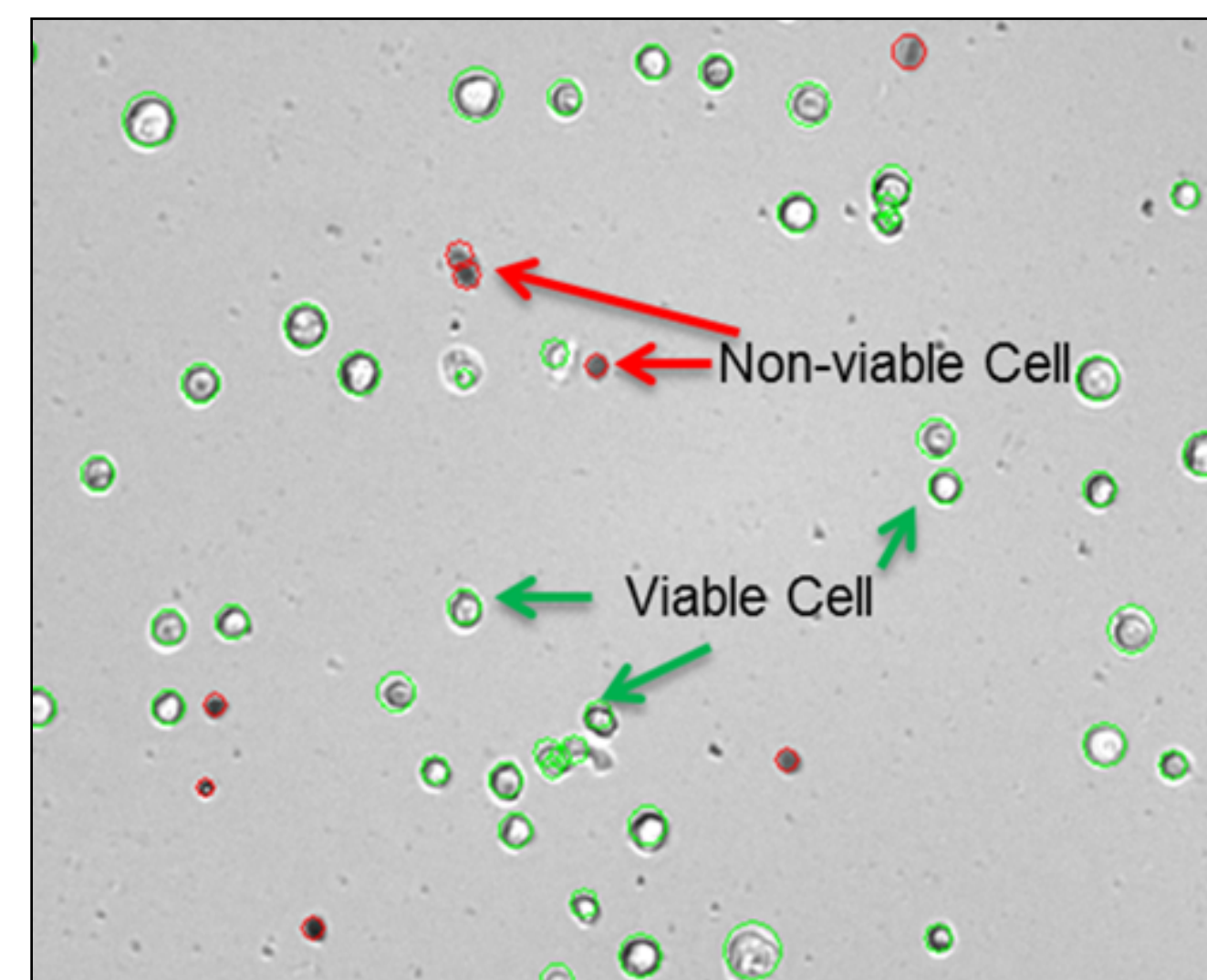
- Temperature can range from 4° C to 70° C, with a relative high humidity (RH) of up to 98% stable CO<sub>2</sub> conditions, and shaking
  - Mammalian cell conditions: 37° C, 95% RH, and 5% CO<sub>2</sub>
- A Biomek i7 integration with an incubator eliminates recovery loss and reduces assay variance
  - Increase throughput
  - Streamline long-term cell culture processes
  - Eliminate manual, repeated accessing of cells



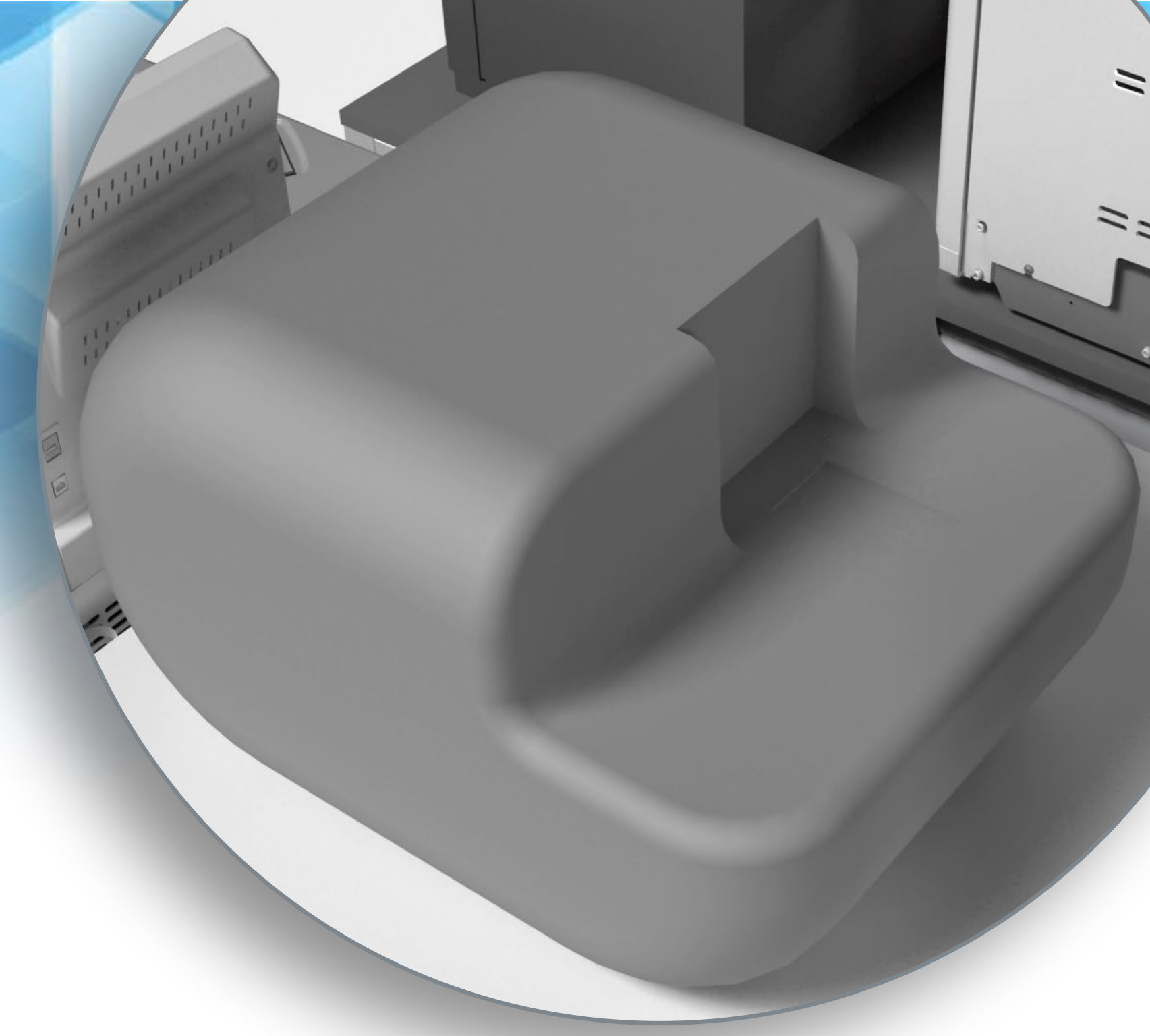
# Vi-CELL

**Eliminate human error and user bias when counting cells and determining viability.**

- Automated solution for Trypan Blue viability assays
- Analyze mammalian, insect, and yeast cell types (2-70 microns)
- Clumpy samples can be differentiated in number and viability
- Quickly and reliably assess cell shape, size, growth rate, and doubling time
- Enhance statistical reliability
- Convenient reagent kit, concentration control, and sample cups
- Viable cells are outlined in **green** and nonviable in **red**:





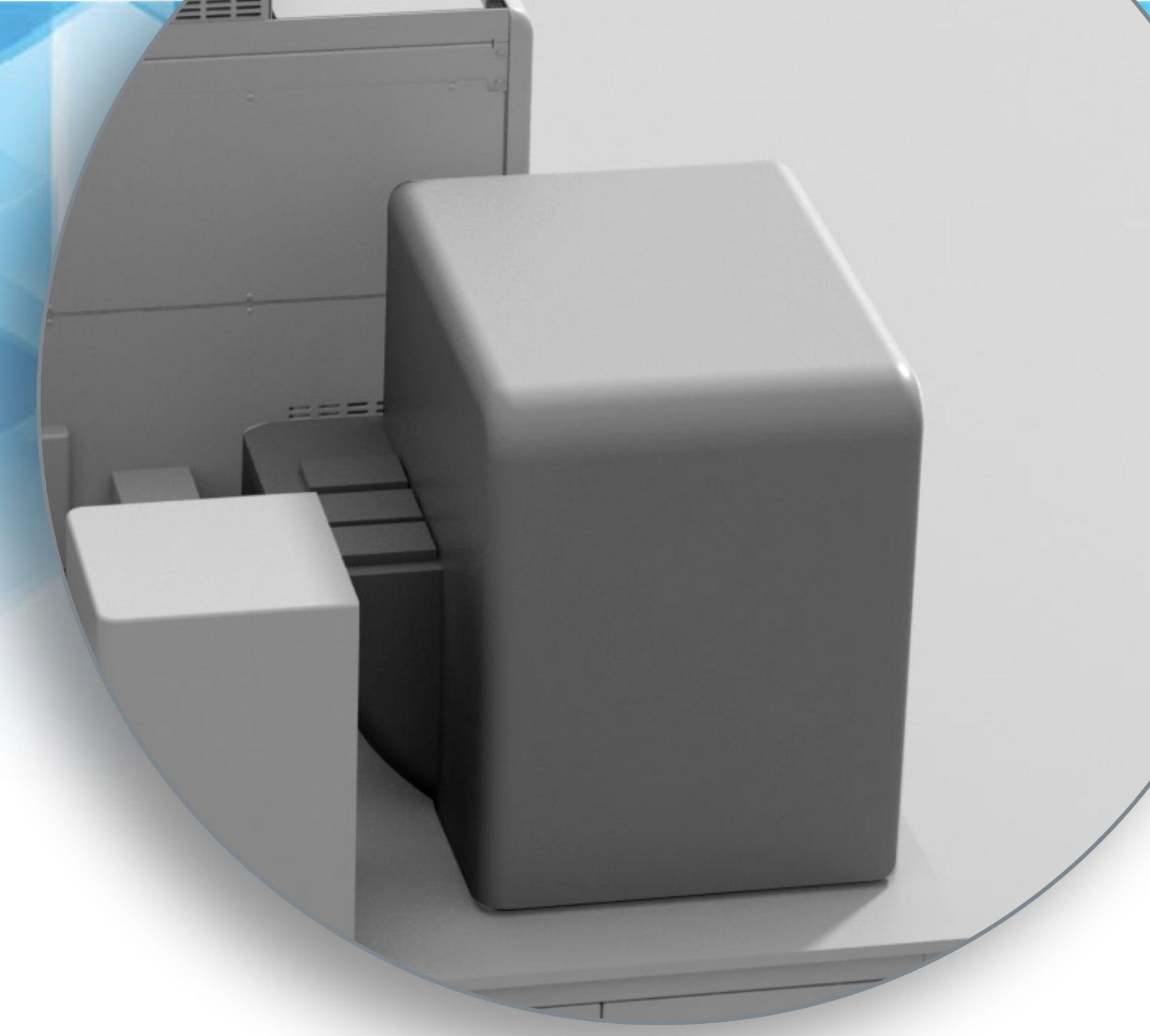


# CloneSelect™ Imager

**Rapidly and objectively monitor cell growth, verify cell line monoclonality, and normalize measurements specific to cell productivity.**

- Ultra-fast benchtop imaging system for:
  - Confluence measurement
  - Growth curve generation
  - Cell number estimation
  - Monoclonality verification
  - Colony forming assays
  - Cytotoxicity assays
  - Cell migration assays
- Consistent results in less time
- Saves all images and generated data
- Integrates with Biomek i7 workstation

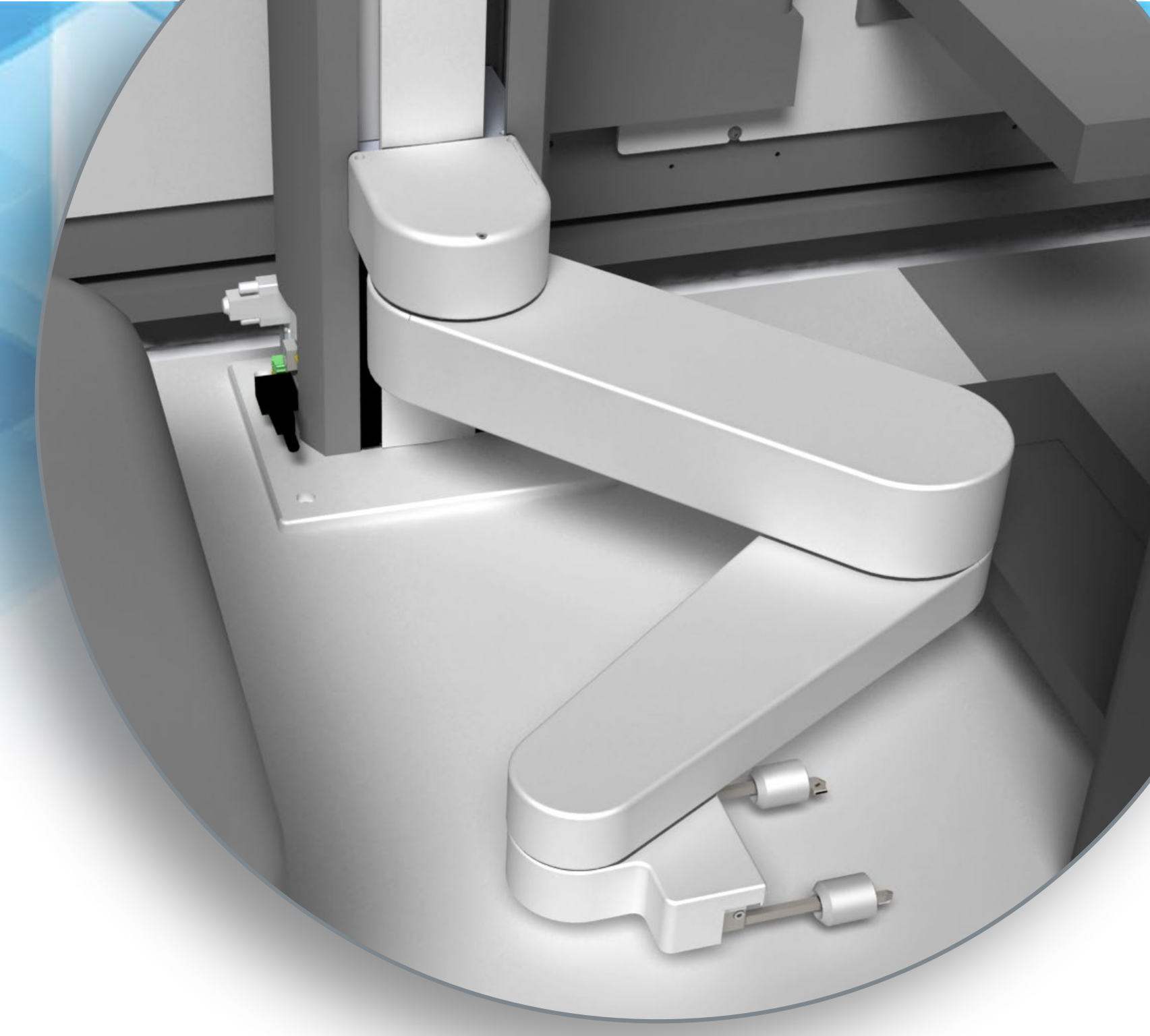
*“CloneSelect Imager has become an essential system for verification of monoclonality within our cell line development workflow.”*



# Octet<sup>®</sup> Systems

**Comprehensively characterize and optimize for cell clone lead(s), then, accurately measure target protein kinetics and concentration.**

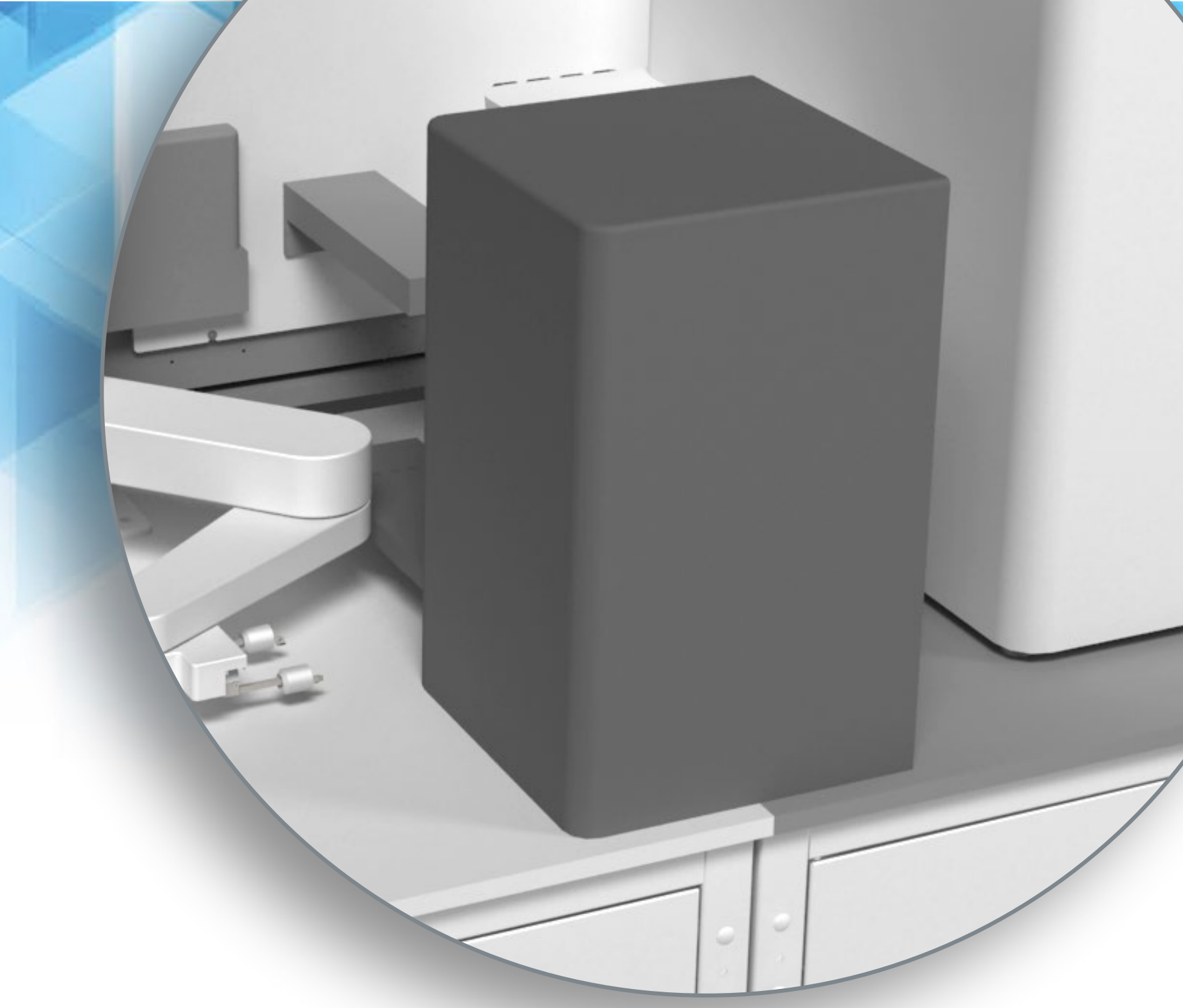
- Label-free biophysical characterization for various stages of cell line development
  - Screen during clone selection to quickly rank by titer or off-rates
  - Reduce sample prep time by assaying proteins directly in crude mixtures
  - Measure specific binding interactions – determine affinity constants, epitope binning
- Complete solution for label-free protein kinetics and quantitation
  - Ligand capture surfaces include antibodies, recombinant proteins, DNA, RNA, and virus-like particles
  - ELISA replacement offering increased productivity and accuracy, with off-the-shelf kits for Host Cell Protein and Residual Protein A impurity detection



# Robotic Arm

**Offers dependable precision and flexibility that not only increases useable workspace, but reliably operates around the clock to eliminate human variability.**

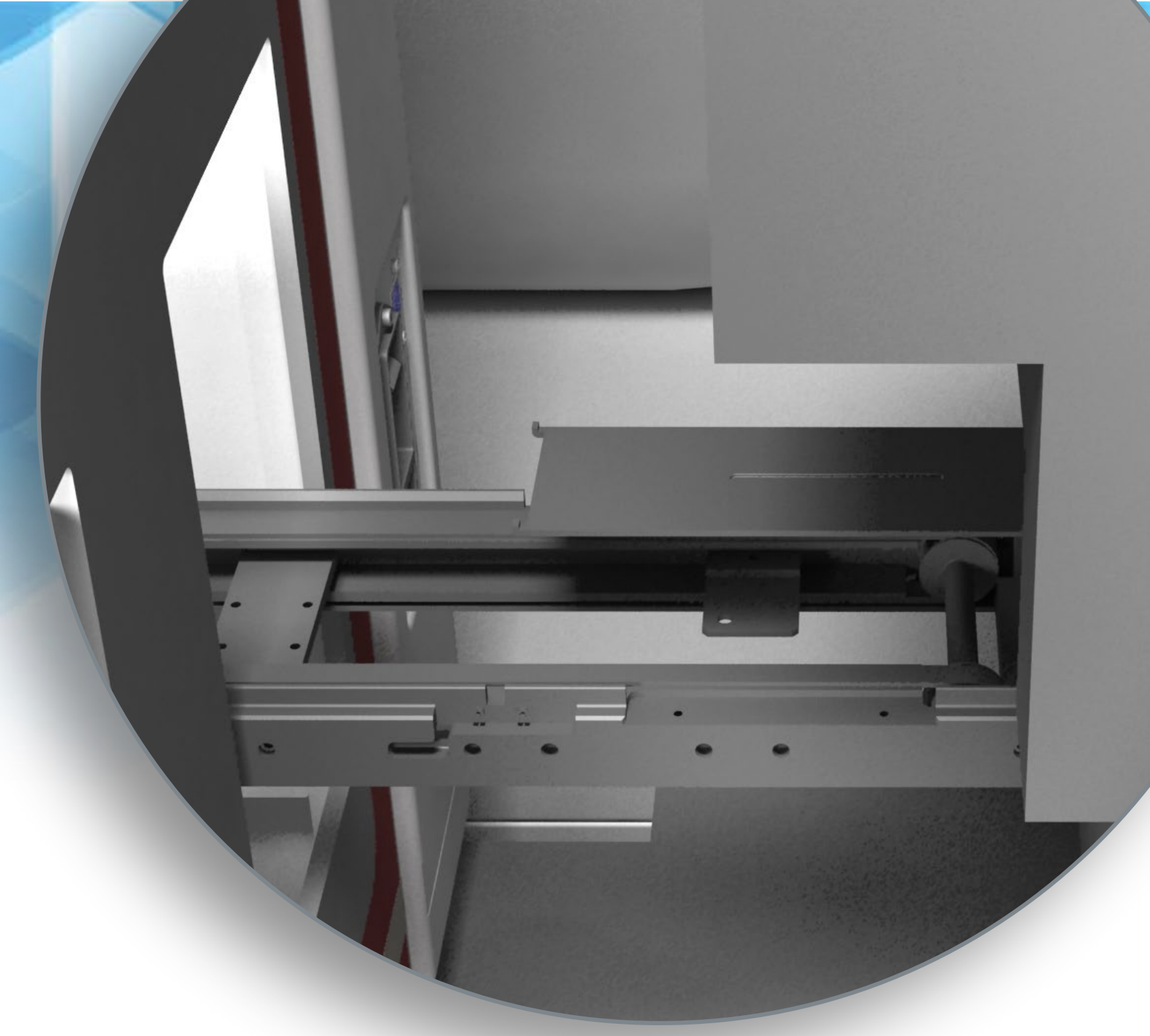
- Multiple axis points can reach peripheral equipment
- Walk away capability increases personnel productivity
- Accelerates time to results
- Enhance data reproducibility
- Improve laboratory ergonomics
- Integrates with Biomek i7



# Capper/Decapper

**Hands-free automated capping and decapping technology ensures sample protection, wholeness, and quality.**

- Cap tubes to optimal torque
- Reliably increase throughput
- Improve laboratory ergonomics
- Benchtap or integrated use
- Internal controls prevent contamination and debris introduction



# Robotic Shuttle

**Controlled robotic plate management with a customizable conveyor track assists with handling consistency and eliminates human-induced accidents.**

- Conveyor transports plates from location the Biomek deck to off deck components within the workstation
- Allows for simultaneous transports on and off deck for maximum efficiency
- Streamlines workflow for maximum productivity



# Avanti JXN High-Speed Centrifuge

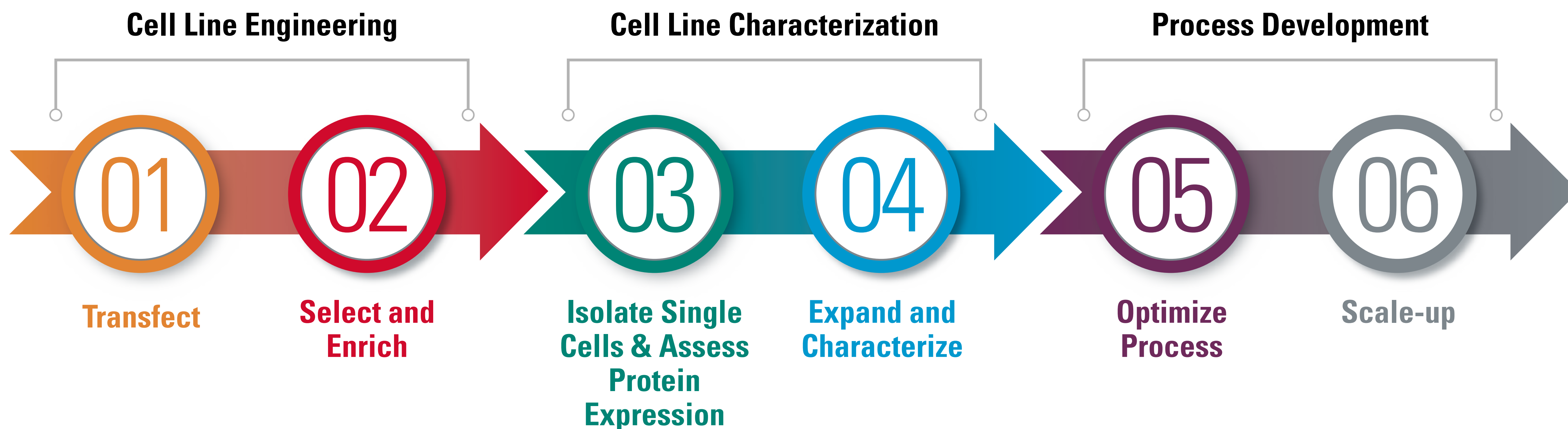
**Enhance isolation and purification workflows for a variety of bioproduction needs.**

- Friction reduction system (FRS) for quicker, quieter, and cooler runs
- Shorter cycle times with high-torque and switched reluctance (SR) drive cycle
- Remote run setup and monitoring
- Hands-free door operation
- Track and control usage and samples
- Efficient, safe workflow matches industry compliance

# WORKFLOW Solutions



Learn about the solutions for each critical step of the process of developing a mammalian cell line for recombinant protein manufacturing using a methotrexate (MTX) amplification system, one of many integrated transfection methods by Beckman Coulter.



Automation can increase efficiency and consistency in selecting high producing cells with desired Critical Quality Attributes.



# Cell Line Engineering



Optimal host cell transfection is dependent on cell health, degree of confluency, DNA quality and quantity, number of passages, contamination, and transfection reagent or method. **OUR SOLUTIONS:**



GO

## Biomek i7 Automated Workstation

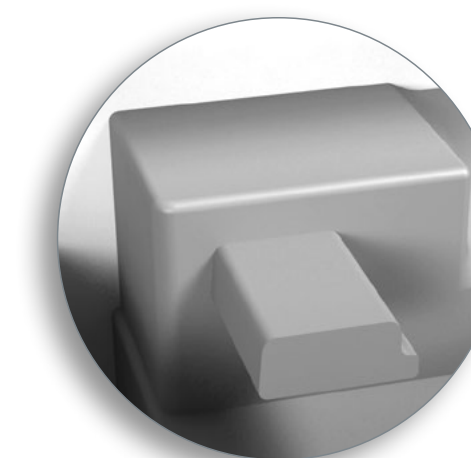
- Preparation of transfection reagents, addition of expression plasmid and transfection reagents
- Cell plating, handling, and maintenance minimize human error, enhancing reproducibility and enabling continuous production



GO

## Vi-CELL XR Cell Viability Analyzer

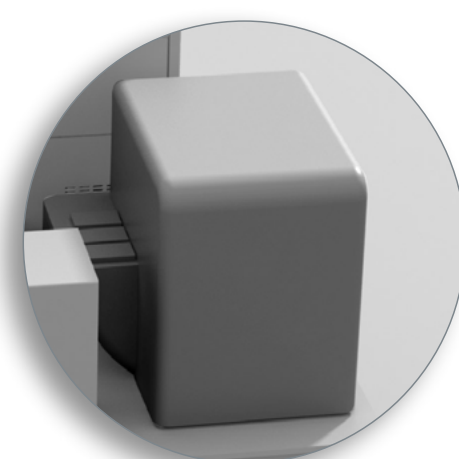
- Count and image cells
- Stain cells and measure viability



GO

## Reagent Dispenser

- Configure reagent containers of wide-ranging volumes



GO

## Octet® Systems

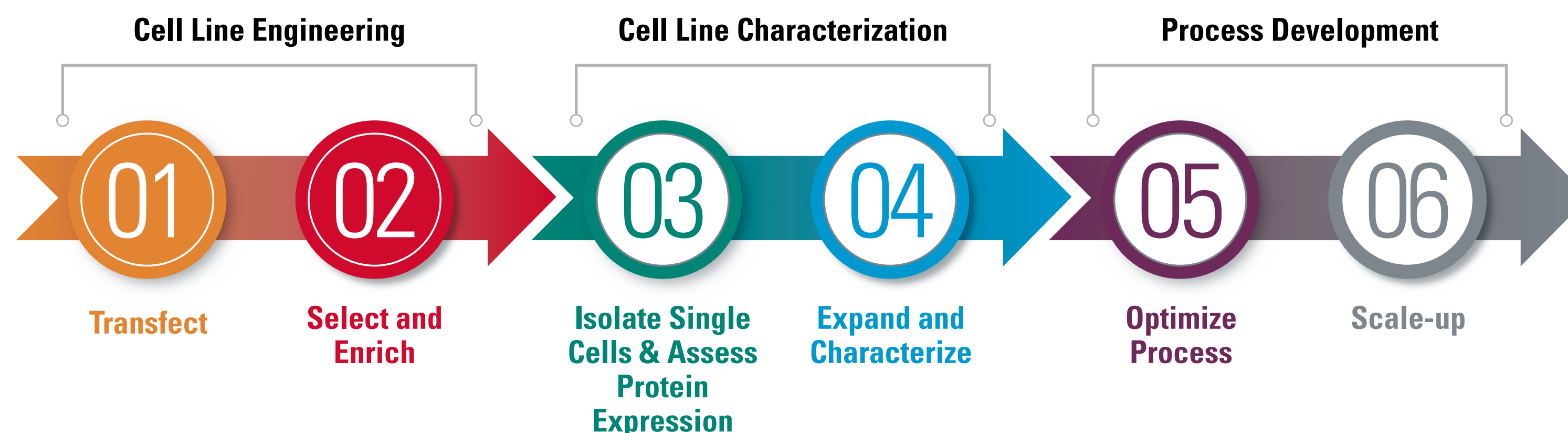
- Measure desired protein concentration



GO

## Robotic Arm

- Moves plates between workstation and Octet/ analyzer

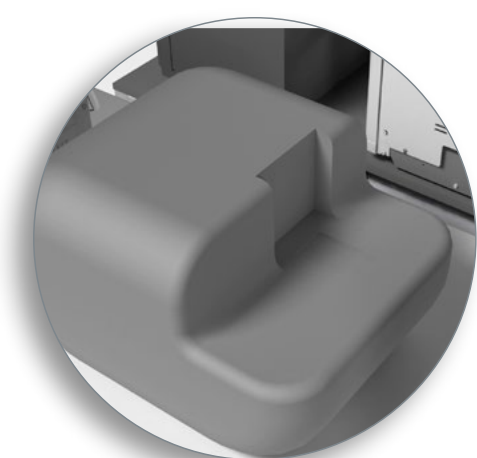




# Cell Line Characterization



Select colonies by sub-cloning, which includes performing multiple rounds of serial dilution to identify the most stable and highest-producing single cell clone. This step is labor intensive and requires weeks to complete. **OUR SOLUTIONS:**



GO

## CloneSelect™ Imager

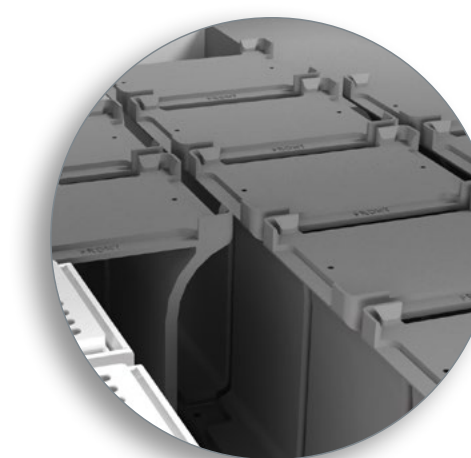
- Verify monoclonality
- Optimize and monitor clonal outgrowth



GO

## Biomek i7 Automated Workstation

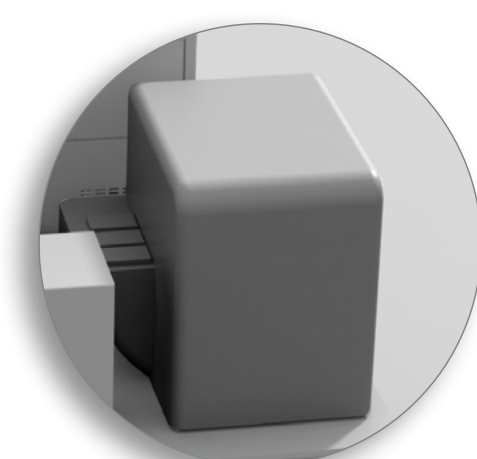
- Cell-plating, handling, maintenance, and hit-picking



GO

## Automated Labware Positioners (ALPs)

- Perform application-specific or general tasks to expedite protocols



GO

## Octet® Systems

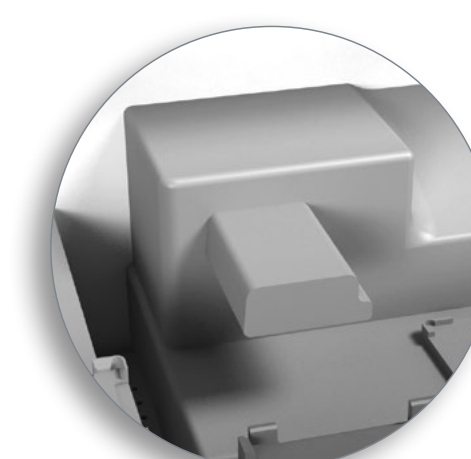
- Measure desired protein concentration



GO

## Robotic Arm

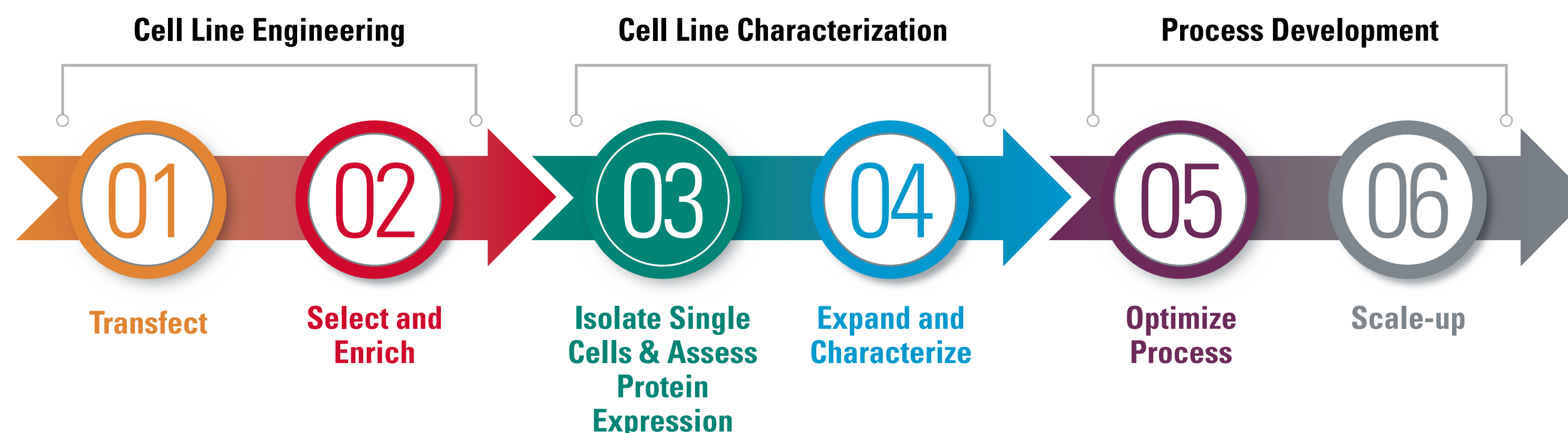
- Moves plates to/from workstation, incubator\*, CloneSelect and Octet analyzers



GO

## Reagent Dispenser

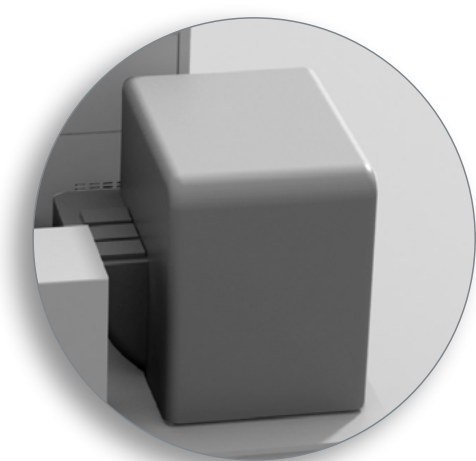
- Configure to dispense reagents from different containers and wide-ranging volumes



# Cell Line Characterization



Expand the clone producing your desired protein to begin the process development and optimization stage. Certifying clone productivity and quality is fundamental to efficient cell line scale up. Maintaining cell culture health and stable production are common pitfalls during this step. **OUR SOLUTIONS:**



GO

## Octet® Systems

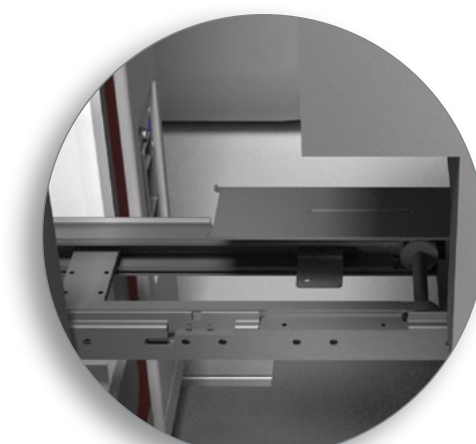
- Characterize and measure protein productivity (e.g., concentration, kinetics, affinity)



GO

## Biomek i7 Automated Workstation

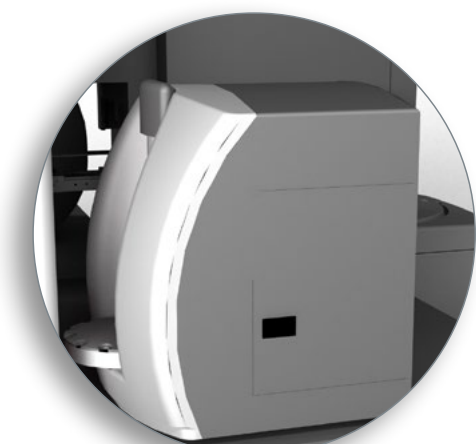
- Hit picking and seeding



GO

## Robotic Shuttle

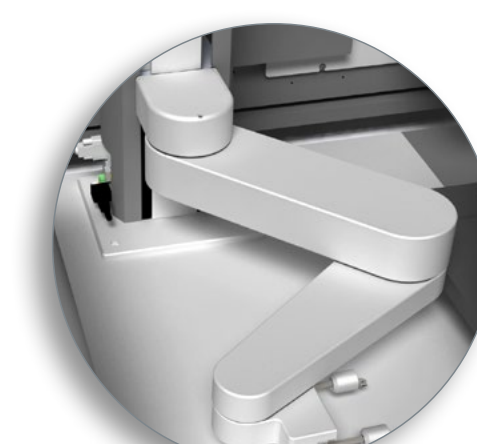
- Conveyor track eliminates human-induced mishaps during transport
- Speed and acceleration can be controlled to prevent splashing in larger-well plates



GO

## Vi-CELL Cell Viability Analyzer

- Count and image cells
- Stain cells and measure viability



GO

## Robotic Arm

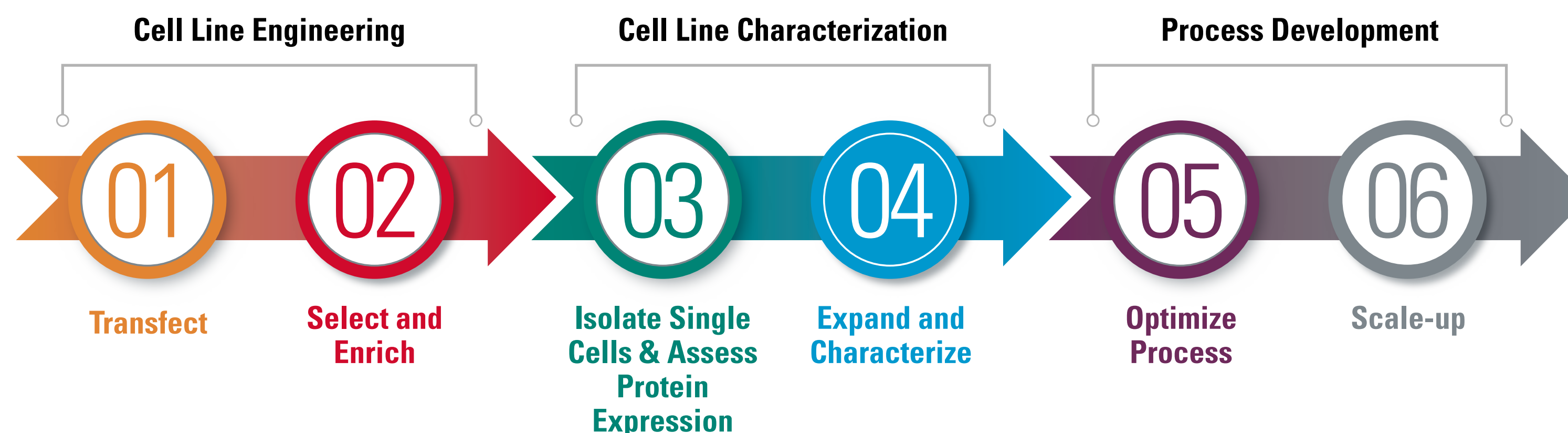
- Moves plates to/from workstation and Octet analyzer



GO

## Avanti JXN High-Speed Centrifuge

- Isolate and purify products reliably and efficiently



# Process Development

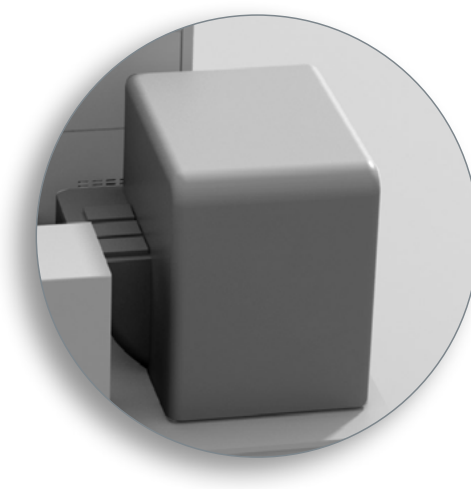
As you scale up, media optimization will enable maximize protein production. An ideal approach is using a factorial design of experiment (DOE), where a variety of media components are tested at different concentrations in combination with one another. Automation of DOE eliminates any sample preparation beyond an optional dilution step and the high throughput models can process up to 96 samples simultaneously. **OUR SOLUTIONS:**



GO

## Biomek i7 Automated Workstation

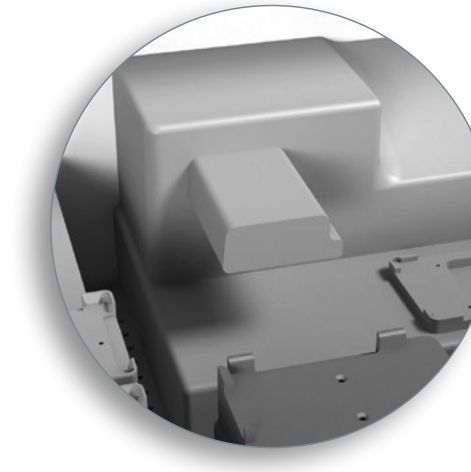
- Tight control of media dispensing volumes
- Gentle cell handling through controlled speed prevents cell shearing and damage
- DOE optimization with multi-channel selection tip



GO

## Octet® Systems

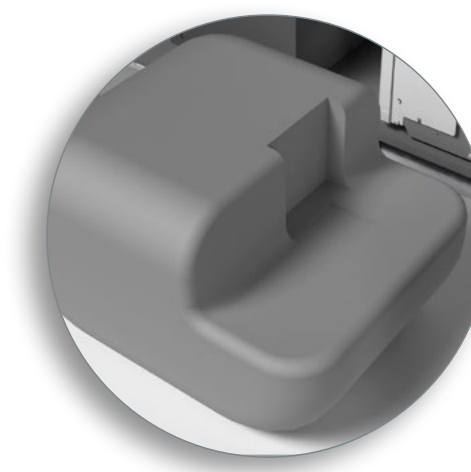
- Measure titer
- Biosensors for quick screening



GO

## Reagent Dispenser

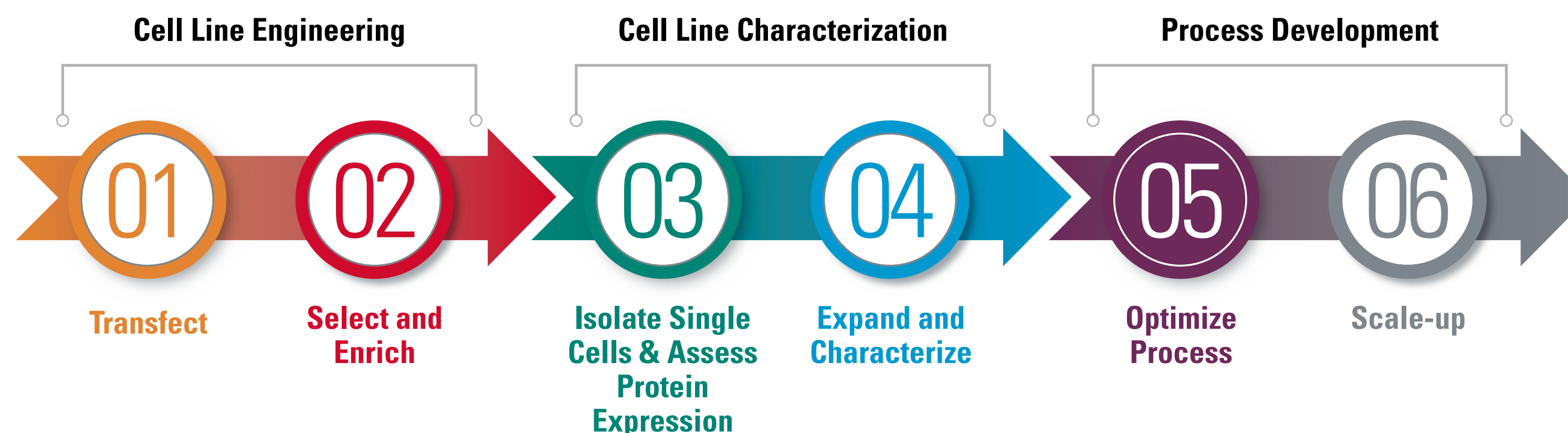
- Configure reagent containers of wide-ranging volumes



GO

## CloneSelect™ Imager

- Monitor cell growth



# Disclosures & Copyright Statements



Biomek Automated Workstations are not intended or validated for use in the diagnosis of disease or other conditions. Beckman Coulter Life Sciences genomic reagent kits are for research US only.

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