MOLECULAR DEVICES

Clone screening solutions

Advance your microbial and mammalian clone screening with proven, automated technologies

QPix 400 Series Microbial Colony Pickers

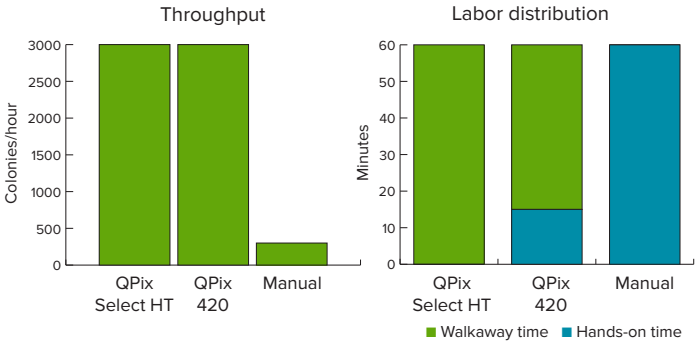
Automated microbial clone screening and library management system

Microbial screening colony picker with sample tracking and plate handling. Fully automate synthetic biology workflows for DNA assembly, antibody discovery and protein engineering.

The QPix® 400 Series Microbial Colony Pickers combine intelligent image analysis with precise automation for fast and efficient screening of large libraries. With a variety of data tracking and assay tools, the QPix Software streamlines the control and management of complex and iterative processes.

- Use the QPix system for synthetic biology, DNA assembly, antibody discovery, protein engineering, and phage display workflows
- Streamline your workflow with scalable automation – pick up to 30,000 colonies per day
- Electronic data tracking for well-documented data control
- Sterile environment with customizable HEPA filtration options

Build more, screen more, increase your colony picking capabilities



Key features and benefits

Identify colonies with a desired phenotype

The QPix colony pickers support a wide variety of microorganisms and multiple selection modalities including fluorescence intensity, blue/white selection, size and proximity, and zone of inhibition.

Select colonies efficiently

A suite of organism-specific pin and agar sensor ensure efficient picking. The system delivers a picking efficiency of >98%, allowing you to walkaway with confidence.

Maintain sterility and eliminate cross contamination

A host of sterility features are available including a UV light for sanitizing the interior of the instrument, customizable pin washing, and halogen pin drying.

Plating and spreading

Replication and hit picking

Multiple imaging modes

Sustainable components

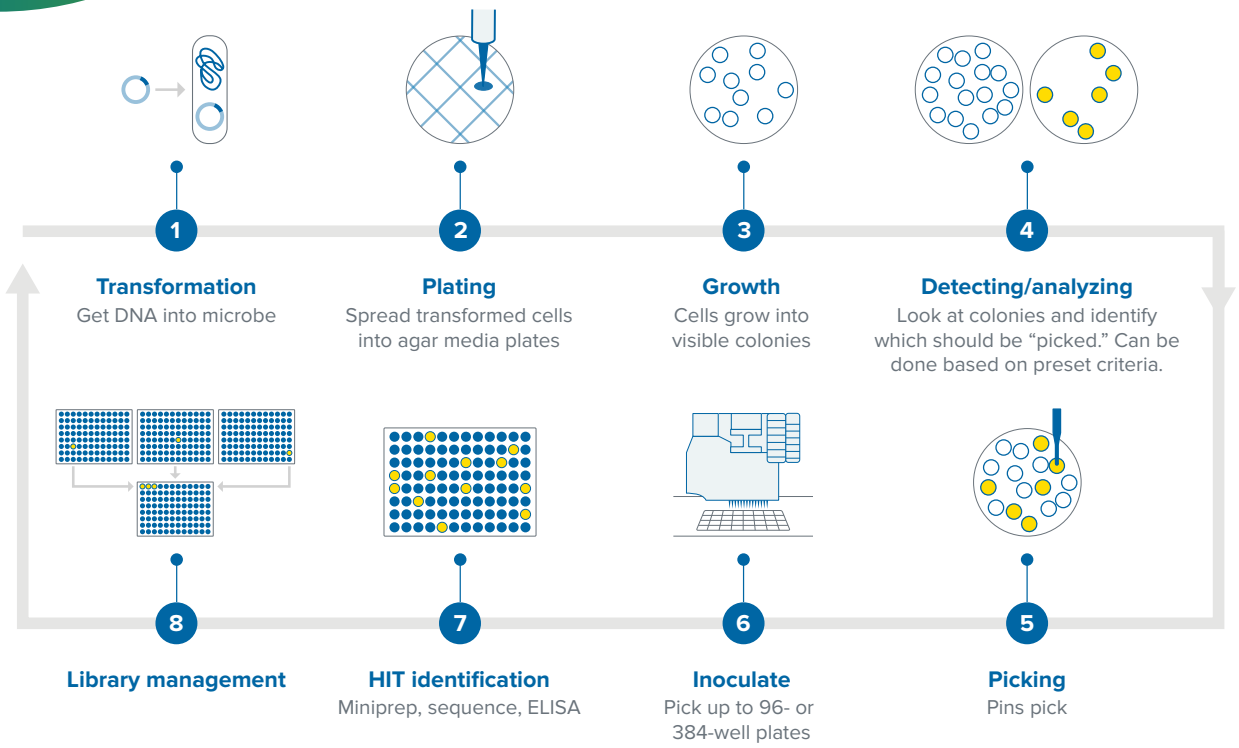
Scalable automation options*

Organism-specific pins

*Price, time to deliver and specifications will vary based on mutually agreed technical requirements. Solution requirements may cause adjustment to standard performance.

Molecular cloning

Molecular cloning is a set of methods, which are used to insert recombinant DNA into a vector—a carrier of DNA molecules that will replicate recombinant DNA fragments in host organisms. This is a very laborious process when done manually requiring hundreds of plates and kits. There are several areas where errors or contamination can occur. Automating the process can dramatically reduce labor while increasing throughput and efficiency twofold.



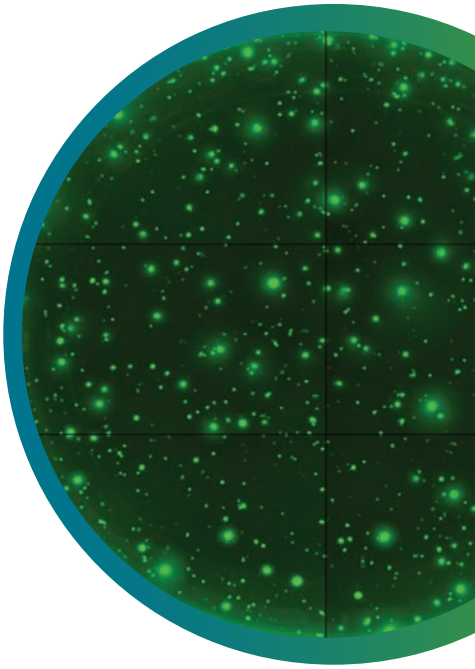
ClonePix 2 Mammalian Colony Picker

Cell line development solutions with automated clone screening

Automate antibody discovery and cell line development workflows

Screen more clones in less time with monoclonal verification on day zero, then screen and identify for highest producers in weeks, not months.

- Screen 10X more clones than limiting dilution
- Increase probability of identifying high-value clones
- Condense the workflow into a single solution
- Eliminate or recover unstable clones early



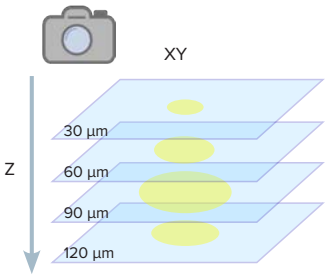
Reduce cost by finding your highest producers with fewer reagents

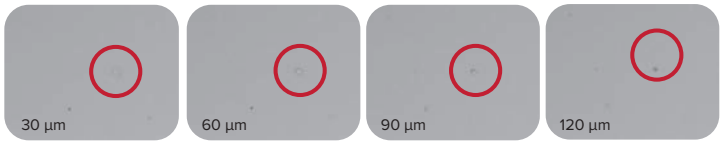
This image represents the number of plates needed to screen 10,000 clones via limiting dilution (the boxes he's sitting on) vs. the ClonePix® 2 Mammalian Colony Picker (plates he is holding in his hand).

How many plate does it take to screen 10,000 clones?

- ClonePix system: 10 plates
- Limiting dilution: 1,000 plates

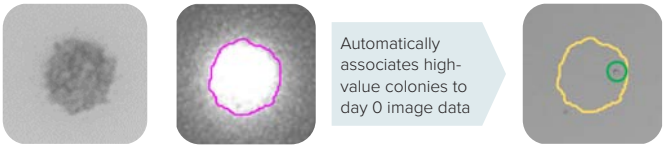
Day 0





Confident identification of single cells is provided by a high precision XY stage mechanism and Z-step motor, which enable accurate alignment of images in XY and Z dimensions, respectively. Imaging over multiple planes decreases the likelihood of misidentifying objects by screening for nearby cells in three dimensions instead of two. Clones can also be visualized in greater details with over 4X increase in resolution compared with previous versions of the ClonePix systems.

Day of picking



Colonies are assessed for productivity *in situ* using fluorescence

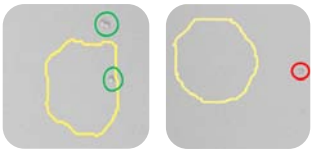
Outline of colony is compared to day 0 image

The enhanced ClonePix system links high-value colonies with its day 0 image for automated assessment of single-cell derived clones.

Monoclonal

Certainty score = 0.92

Not monoclonal



Certainty score = 0.11 Certainty score = 0.06

Fusion software assigns a certainty score to each colony based on picking day, colony location, and single cell Z-stack images at day 0. The threshold of determining monoclonality from the certainty score is variable based on user-defined inputs.

Accelerate cell line development timelines by integrating multiple steps into a single step

Key features and benefits

Screen more clones in less time

ClonePix 2 system is 10X faster than labor-intensive limiting dilution and FACS. Our sophisticated software and integrated robotics enable a screening speed of > 10,000 clones per day.

Select cells with desirable attributes

Easily screen and select clones based on protein productivity, antigen-specificity, cell viability, and expression levels of tagged recombinant proteins.

Pick colonies with accuracy

Picking accuracy < 1 mm. Robotic picking reduces risk of colony disturbance. Images of picked clones are stored with data.

Automated plate handling

Multiple detection methods

Custom automation options*

Maintain sterility and eliminate cross contamination

*Price, time to deliver and specifications will vary based on mutually agreed technical requirements. Solution requirements may cause adjustment to standard performance.

CloneSelect Imager FL

High-speed fluorescence and white light imaging, intelligent data analysis and monoclonality report generation

Your next-generation fluorescence imaging solution

The CloneSelect® Imager FL is a high throughput imaging solution that can help you track the formation of a colony from a single cell effortlessly through barcoded plates tracked over time. Automated acquisition and analysis provides accurate, objective, and consistent results.

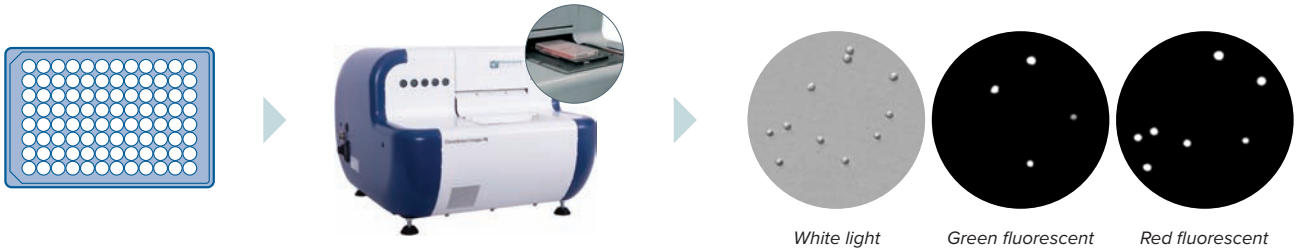
- Demonstrated IND success. Monoclonality Reports are automatically generated based on parameters you select.
- Multichannel fluorescence for evaluation of GFP/RFP expression system and day zero assurance of monoclonality.
- Multichannel confluence and growth rate measurements for further cell characterization.

Streamlined workflow

1. Image
2. Analyze
3. Report

1 Image

- High-speed, high resolution multichannel fluorescent and white light imaging
- Optimize clonal outgrowth—particularly useful for optimizing clonal outgrowth strategies when platform approaches are not suitable e.g. when investigating new cell lines or variants.
- Diverse cell types—Compatible with adherent or settled suspension cell types such as CHO, HEK, hybridomas, iPSCs, and many other cell types.



CloneSelect Imager FL

White light | *Green fluorescent protein (GFP)* | *Red fluorescent protein (RFP)*

Multichannel fluorescent imaging

Identify engineered cells with multichannel fluorescence
- CRISPR or other genetic editing assays
- Selection markers

Run hit picking assays with multichannel fluorescence

Screen for productivity

Run comparative confluence assays

Red vs green fluorescent channels

Run cytotoxicity assays with fluorescence or white light
- Compare growth rates, colony size increase/decrease well to well
- Track changes in cell density in response to various cellular manipulations or treatments to calculate dose response curves and IC_{50}
- Label free detection, no staining required. Avoid costly colorimetric kits

CloneSelect Imager

Objective, quantitative assessment of cell growth

Verify monoclonality confidently

The CloneSelect® Imager can help you meet regulatory demands of single cell verification with its automated analysis of cells in the white light channel. The system also enables concurrent confluence and monoclonality studies.

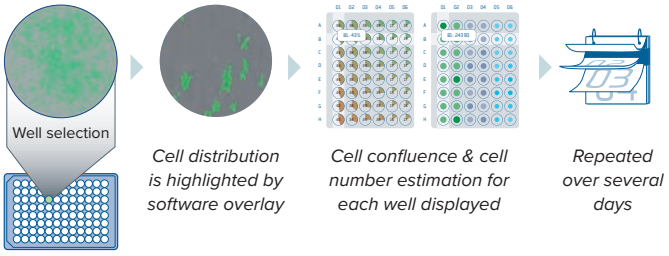
- Document evidence of single cells and confluency digitally for auditing and submission to regulatory authorities
- Image cells non invasively at multiple time points to monitor colony formation
- Screen using high resolution white light imaging
- Deliver real-time results with on-the-fly analysis
- Automation and integration ready

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

Dr. Howard Clarke
Senior Staff Scientist
in Process Development,
CMC ICOS Biologics Inc., USA

2 Analyze

- Cell confluence and cell number estimation displayed for each well
- Growth curves calculated and displayed



Cell distribution is highlighted by software overlay

Cell confluence & cell number estimation for each well displayed

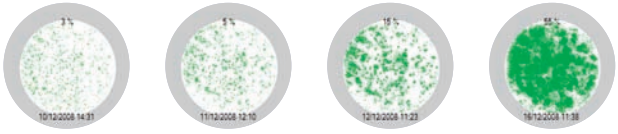
Repeated over several days

3 Report

- Make confident, image-driven decisions throughout plate history
- Track and view growth of every cell line

Growth curves calculated and displayed

- Electronically track and store plate data: cell confluence, cell number estimation, and growth curve



3% Day 1 *5% Day 2* *15% Day 3* *55% Day 7*

View every growth curve in every well

Key features and benefits

Verify monoclonality easily

The Monoclonality Report feature streamlines the creation of supporting documentation for regulatory agencies. Reports are automatically generated based on parameters you select.

Detect cells accurately

Algorithms are optimized for accurate cell detection and address varying cell types and conditions. High resolution imaging provides accuracy and assurance of monoclonality.

Screen more clones in less time

The imager delivers industry leading acquisition times, allowing for imaging a 96-well plate in as little at 90 seconds.

Variety of plate formats and cell types

Choice of imaging modes

Autogenerated data and tools

Clear, crisp images

Intelligent analysis

Custom automation options*

*Price, time to deliver and specifications will vary based on mutually agreed technical requirements. Solution requirements may cause adjustment to standard performance.

DispenCell Single-Cell Dispenser

Single-cell cloning using image-based cell sorting

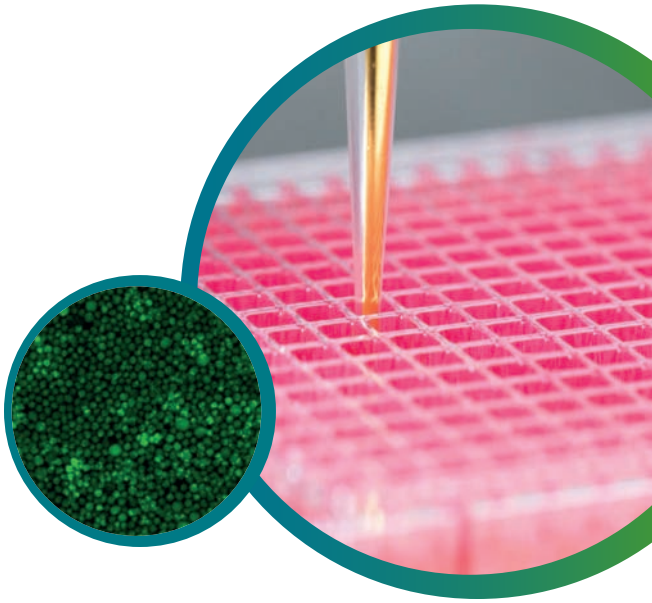
Automation for fast, easy and gentle single-cell isolation

DispenCell integrates seamlessly into your laboratory workflow, with a plug-and-play approach. Flexible and effortless, DispenCell operates equally under sterile conditions in a culture hood, or on a simple benchtop.

- Confidently isolate single cells and provide consistent, high-quality evidence of monoclonality to the FDA
- Highly efficient single-cell sorting with an average monoclonality reliability of > 90% observed
- Extremely gentle handling of the cell sample (less than 0.1 si), while preserving cell viability and outgrowth
- Minimize cross contamination through disposable cell dispensing cartridges
- Fast turnaround time—prints a 96-well plate in less than 10 minutes (384-well plate in less than 40 minutes)
- Sort wide range of cell lines: CHO, HEK, SF9, iPSC, primary cells
- Compact footprint takes up a small amount of valuable bench space

Proof of monoclonality

DispenSoft, the single-cell analysis software included with DispenCell, provides immediate and traceable proof of clonality. The instrument is fitted with a sensing tip that detects the passage of cells, allowing users to check for proof of clonality immediately after the cells are dispensed. All dispensing data is automatically stored, allowing for easy generation of a clonality report.



Key features and benefits

Proof of clonality

A single-cell analysis software tool provides a traceable proof of clonality report instantly.

High cloning efficiency

Unique design ensures gentle dispensing for better viability and cloning efficiency.

Contamination-free

A patented disposable tip ensures clean isolation of single cells and no cross contamination. Certified free from animal products and cytotoxic material.

As gentle as manual pipetting

DispenCell has unique technology which allows for extremely gentle handling of the cell sample. Cells are exposed to no more pressure than with manual pipetting (less than 0.1 psi). This allows the instrument to preserve cell viability and outgrowth while simultaneously increasing cell deposition efficiency.

Compact

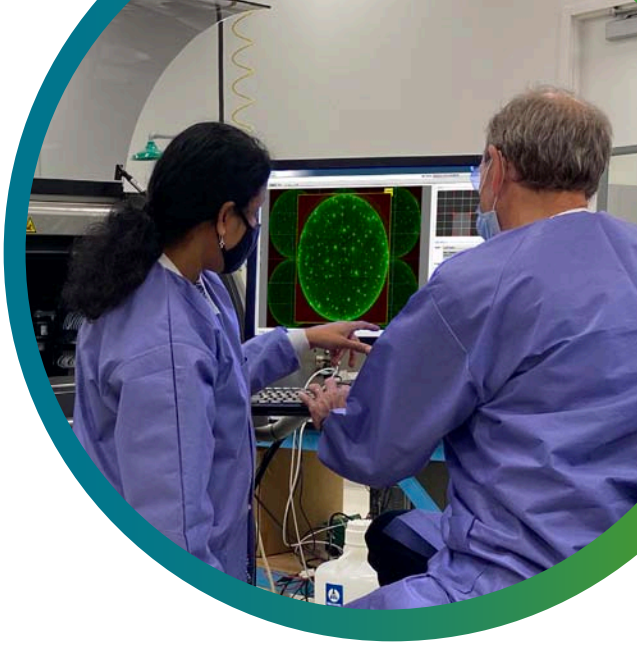
The small footprint of the DispenCell allows it to fit perfectly into any laboratory setting: under a hood to work under sterile conditions, on a bench top for routine seeding, or in a pre-existing automated workflow.

Easy to use

Easy to set up, and intuitive with a simple interface. No cleaning or calibration required.

Clone screening systems

Dedicated solutions for clone screening and single cell isolation



Verify monoclonality easily

Objective selection, imaging, and data collection streamlines tracking of colony formation from a single cell.

Sort viable single cells efficiently

High accuracy robotics combined with gentle fluidics-based systems establish viable clones with much higher efficiency.

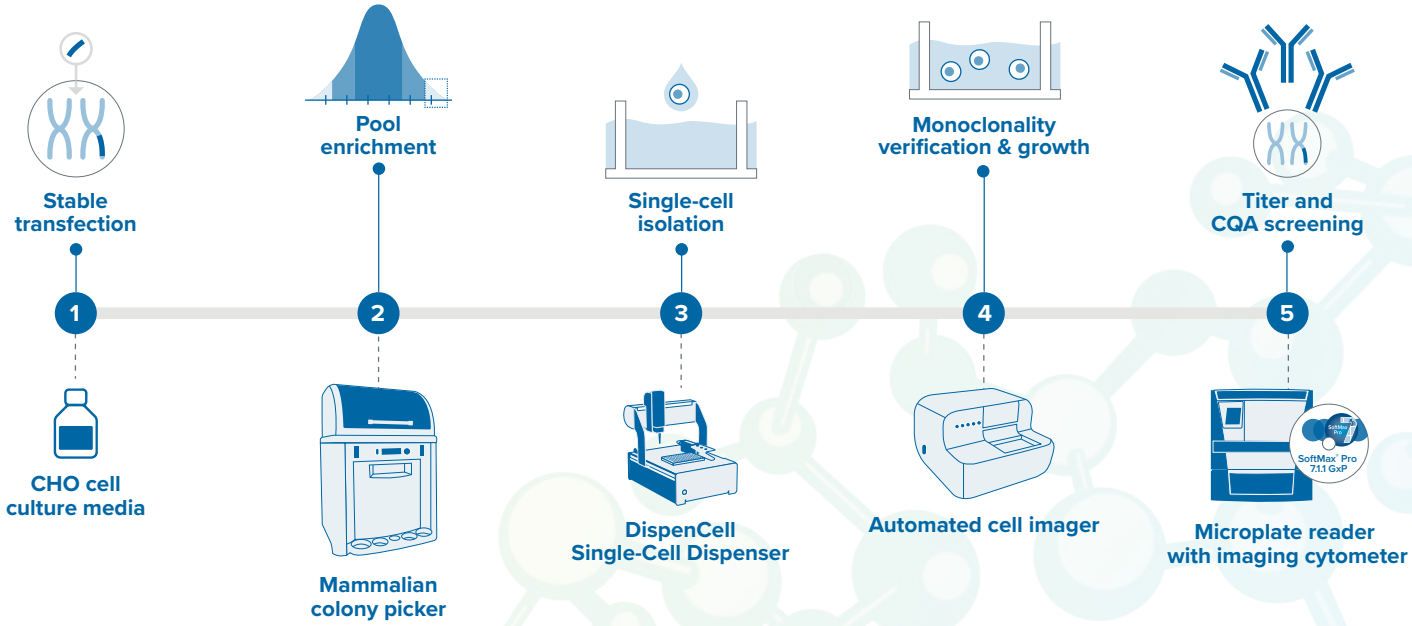
Streamline workflows

Automation with sample tracking increases throughput, allows for more walk-away time, and provides consistent results.

Develop stable cell lines

Typical cell line workflow

Cell line development is the process of establishing a clonally-derived cell population which has been genetically engineered to express a desirable phenotype (such as producing large amounts of recombinant protein) for a stable period of time. Single cells proliferate to form colonies that can then be assessed for the desirable characteristic.



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