



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

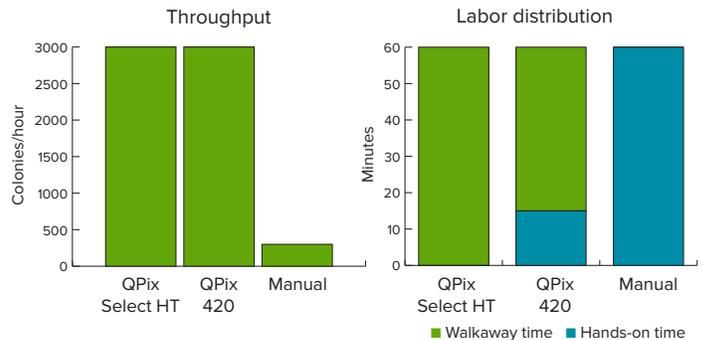


Microbial screening colony picker with sample tracking and plate handling. Fully automate synthetic biology workflows for DNA assembly, antibody discovery and protein engineering.

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*



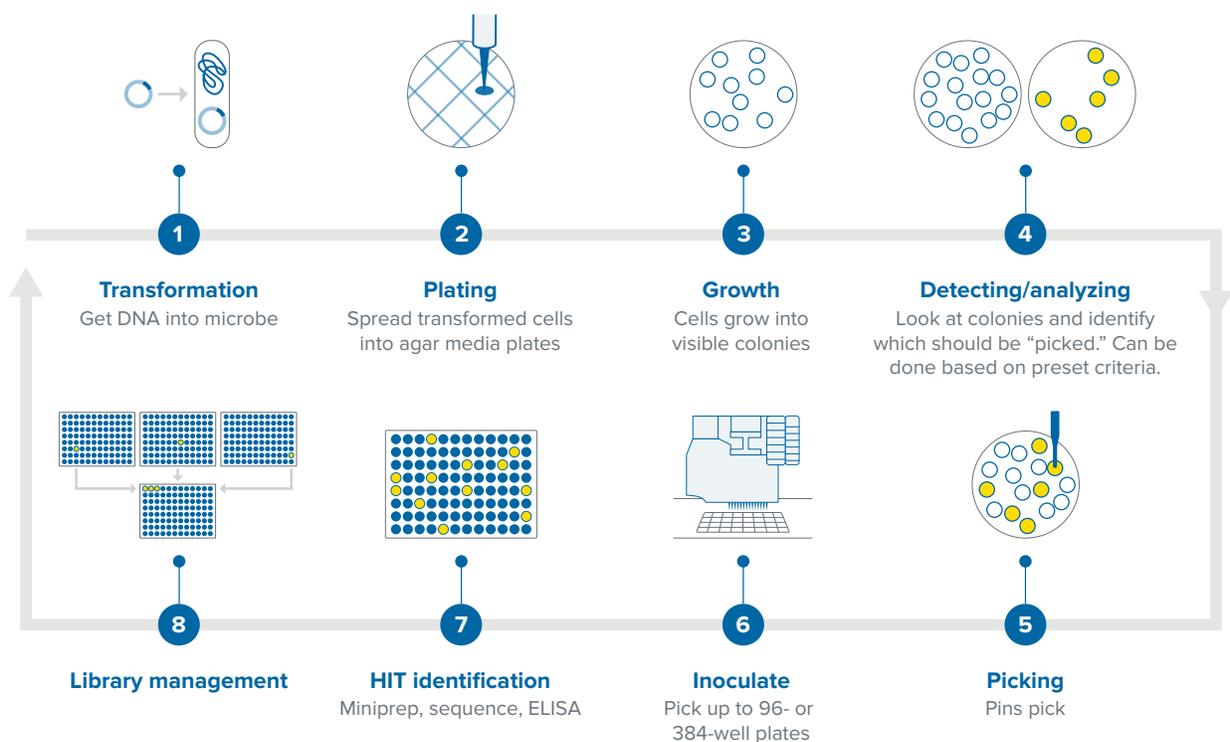
Organism-specific pins

*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.



Inscripta enables scientists to perform digital genome editing with their Onyx system integrated in a fully automated workflow that includes the QPix system

The Challenge

Inscripta's vision is to democratize scalable genome editing to the world by offering a holistic platform consisting of software, instrument, reagents, and consumables to enable forward engineering solutions that are faster, easier, and more cost-effective for their customers. The output of the Inscripta Onyx genome editing system is a pool of cells containing up to 10,000 unique edits that necessitate picking large numbers of colonies (e.g. 1,000 – 10,000) into high-throughput microtiter plate-based screening workflows.

The Solution

The QPix and Onyx systems are synergistic tools that allow customers to effectively generate and screen phenotypic diversity to enable successful bioeconomy solutions for the next generation of synthetic biology companies.



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.

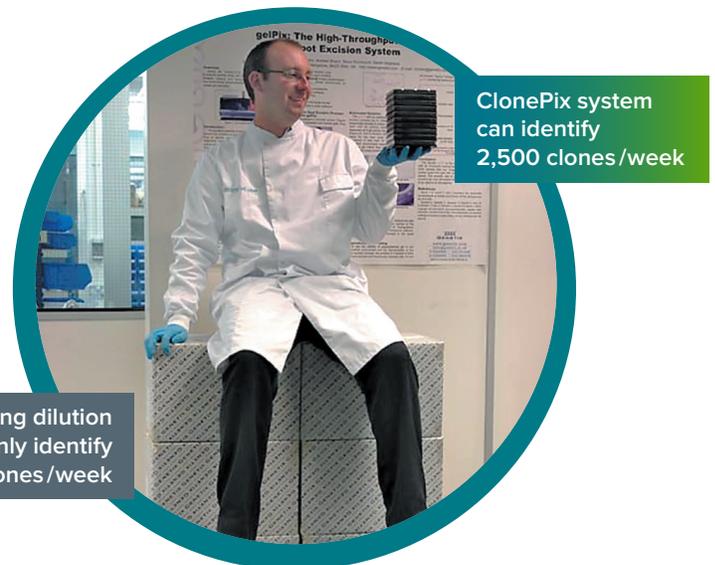
- Screen 10X more clones than limiting dilution
- Increase probability of identifying high-value clones
- Condense the workflow into a single solution
- Eliminate or recover unstable clones early

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



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*

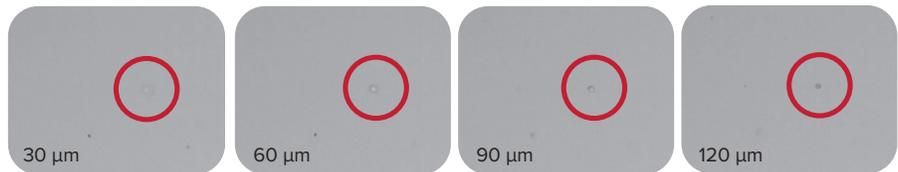
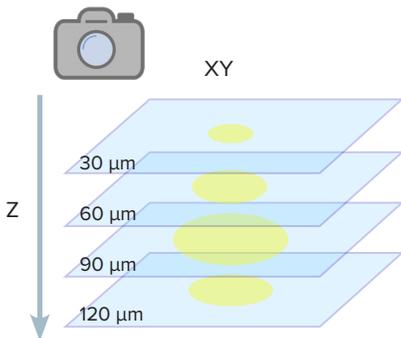


Maintain sterility and eliminate cross contamination

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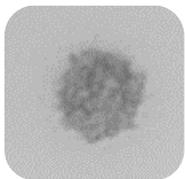


Day 0

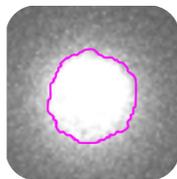


Confident identification of single cells is provided by a high precision XY stage mechanism and Z-step motor, which enable accurate alignment of images in XY and Z dimensions, respectively. Imaging over multiple planes decreases the likelihood of misidentifying objects by screening for nearby cells in 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



Automatically associates high-value colonies to day 0 image data

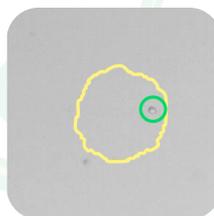


Outline of colony is compared to day 0 image

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

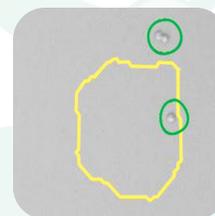
Accelerate cell line development timelines by integrating multiple steps into a single step

Monoclonal

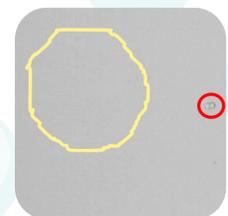


Certainty score = 0.92

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.

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.

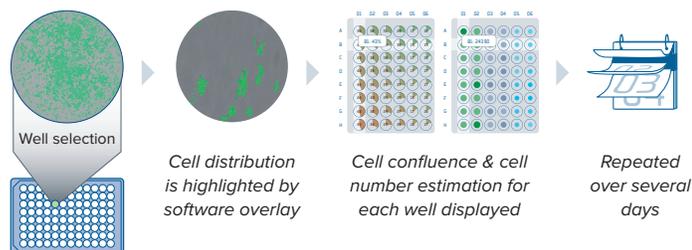
- Document evidence of single cells and confluency digitally for auditing and submission to regulatory authorities
- Image cells non invasively at multiple time points to monitor colony formation
- Screen using high resolution white light imaging
- Deliver real-time results with on-the-fly analysis
-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

Analysis

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



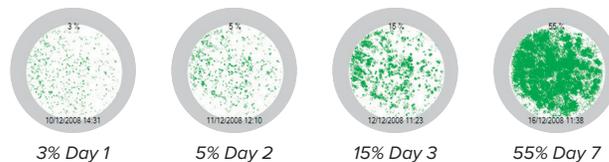
Report

- 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



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 as 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*

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CloneSelect Single-Cell Printer Series

Single-cell cloning using image-based cell sorting



*Only available in North America, China, Hong Kong, and Taiwan

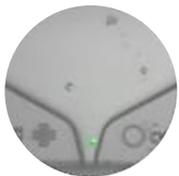
Demonstrate monoclonality with greater confidence

The CloneSelect® Single-Cell Printer™ (SCP series) by Cytena and Molecular Devices is a fully automated system that utilizes proprietary microfluidics-based technology and real-time image analysis to sort and deposit single cells into standard microplates—while simultaneously providing assurance of monoclonality through image documentation.

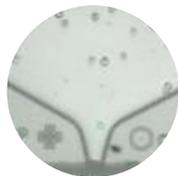
- Confidently isolate cells and provide consistent, high-quality image evidence of monoclonality to the FDA
- Enable the isolation of highly sensitive cell lines by increasing post-sort viability up to 15X compared to flow cytometry
- Improve clonal outgrowth over 5X compared to limiting dilution due to highly efficient cell sorting
- Minimize cross contamination through disposable cell printing cartridges
- Fast turnaround time—prints a 96-well plate within 5–10 minutes
- Sort wide range of cell lines: CHO, HEK, SF9, iPSC, primary cells

Eyewitness proof of monoclonality

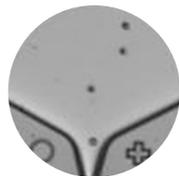
The CloneSelect Single-Cell Printer deposits single cells gently and with high efficiency using a patented, inkjet-like disposable, one-way dispensing cartridge. Sort cells using high-res imaging in either bright field or optional fluorescence and capture five images per each single cell deposit. Prove monoclonality, improve your efficiency, maintain and enrich your viability, and prevent cross-contamination.



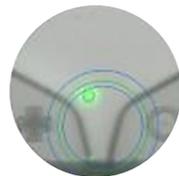
CellTracker Green stained CHO cells



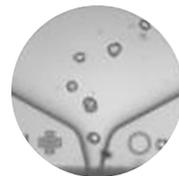
CHO mAb staining (cold capture assay)



Erythroid progenitor cells (blood therapy)



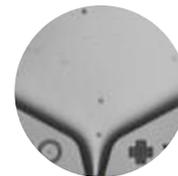
CRISPR/CAS9 edited mesenchymal stem cells



Hepatocytes (isolated from mice)



Mouse colonic sensory neurons



Peripheral blood mononuclear cells (PBMCs)

Key features and benefits



Cell isolation proof captured

Document a sequence of five images as the cell is dispensed, providing direct image evidence of monoclonality in 96- or 384-well plate formats.



Clonal outgrowth improved

Achieve up to 8X improvement in clonal outgrowth efficiency over traditional methods. Deposit single cells with high efficiency into 96- or 384-well plates. It takes as little as ~5 min to dispense into a 96-well plate.



Cells stay healthy and clean

Maintain cell viability with gentle sorting as seen with outgrowth assays, and prevent cross contamination with sterile, disposable, one-way flow cartridge.



Fluorescence imaging and sorting



Dispensing a wide variety of cell types



Microfluidics technology

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

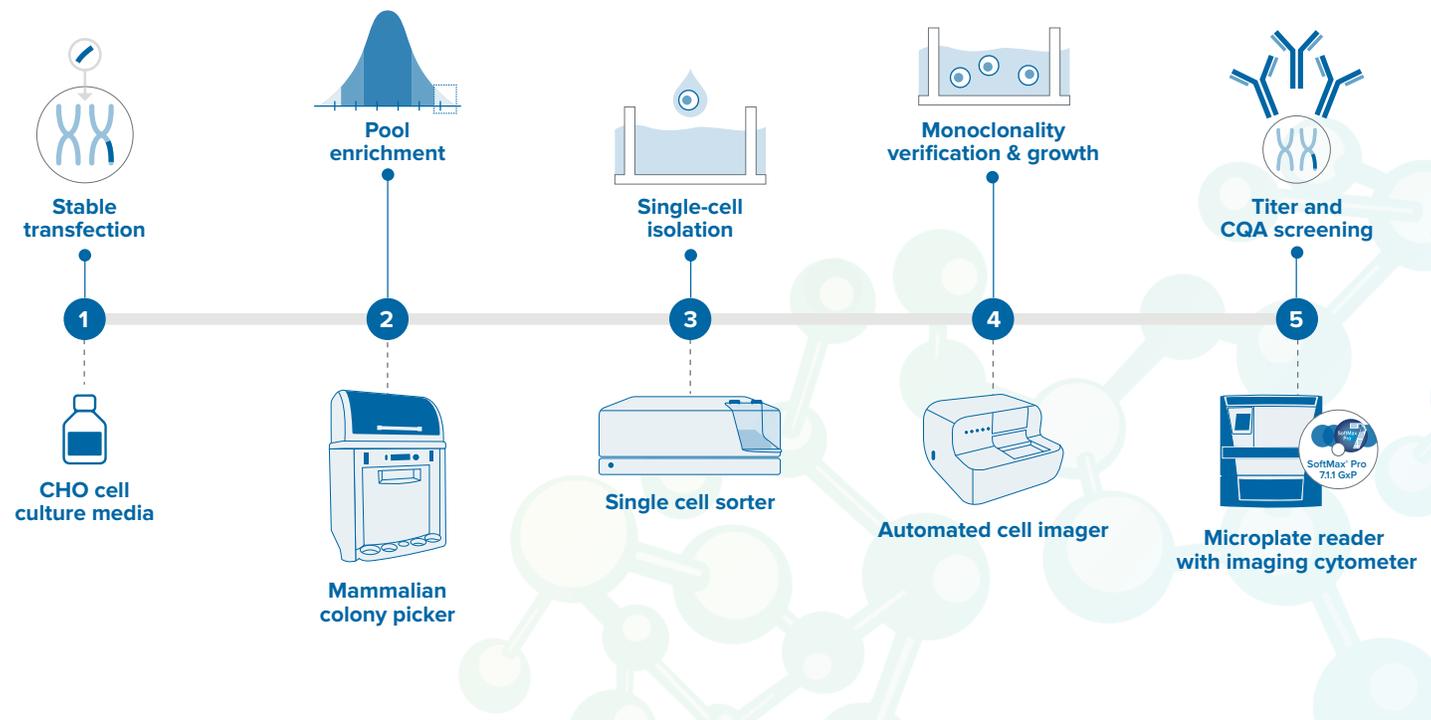
Automation with sample tracking increases throughput, allows for more walk-away time, and provides consistent results.



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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