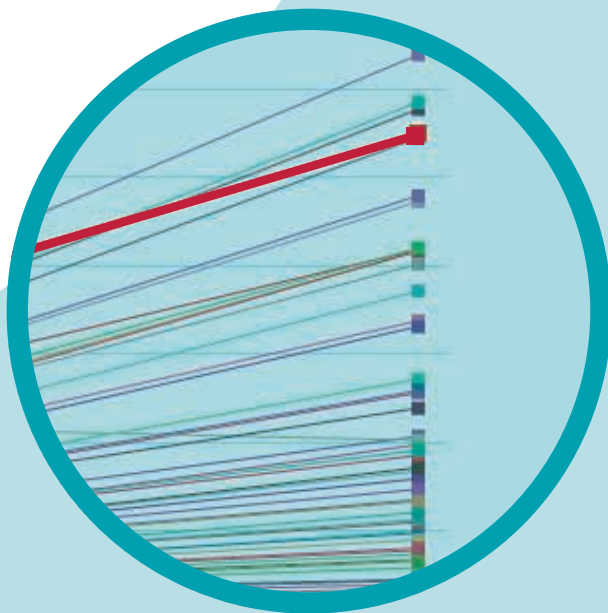


CloneSelect™ Imager

Objective, quantitative assessment of cell growth

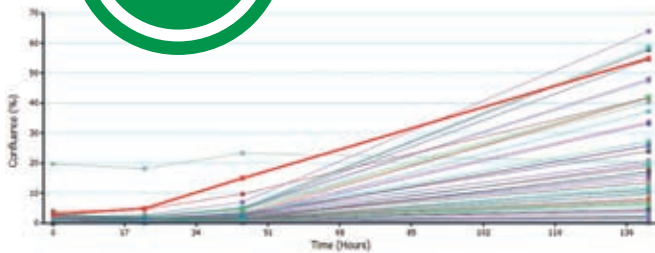


Assess cell confluence objectively and quantitatively

Rapid determination of the growth of cell lines is important for a number of processes, such as optimization of cell culture conditions and verification of monoclonality.

However, conventional techniques are time-consuming, subjective and may risk interference with cell growth:

- Tracking cell growth in 96-well plates is challenging and labor-intensive
- Fluorescent dyes, used to determine cell number from cell confluence, may affect final results



Produce consistent results – in less time

Save time and produce objective, quantitative, and consistent results by using the CloneSelect™ Imager system to overcome the challenges associated with conventional techniques.

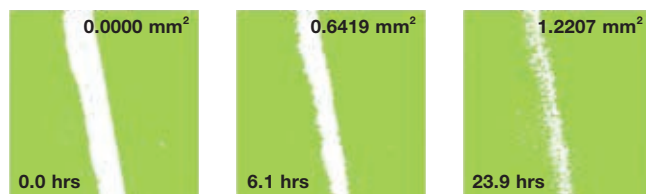
- Label-free white light imaging of living cells
- Suitable for adherent and settled suspension cells
- Growth rates accurately determined in every well of a 96-well plate

New application

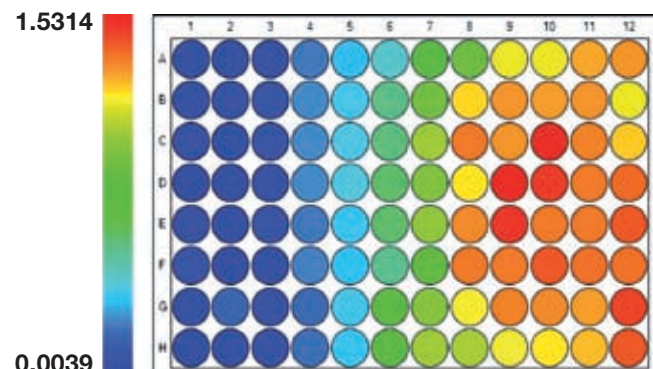
Visual readouts for label-free, cell migration assays

- Determine migration rates, maximum migration rate and total migration area
- Screen one microplate within 3 minutes
- Easy to read, numerical and graphical output

Wound healing time course



Wound healing heat map



Track and record cell growth



CloneSelect Imager system estimates cell confluence and cell number.

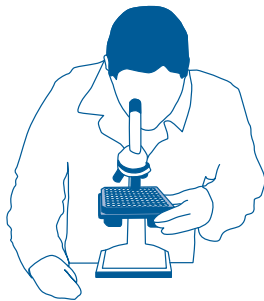
- Automatically scans every well in every plate
- Generates growth curves for each well
- Enables viewing and tracking of every well in every plate
- Reveals additional information on cellular morphology and an understanding of growth characteristics

Optimize clonal outgrowth

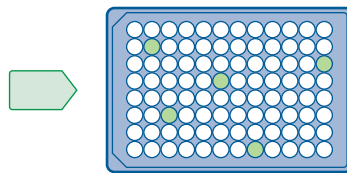
The system is particularly useful for optimizing clonal outgrowth strategies when platform approaches are not suitable e.g. when investigating new cell lines or variants.

Idea

Conventional technique: subjective, time-consuming



Sample by eye within wells across each plate



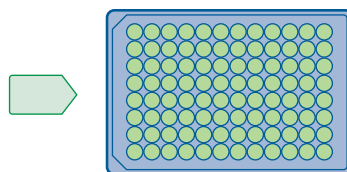
Inconsistent results

Cannot determine whole well confluence – well after well

CloneSelect Imager: objective, automatic



Scan every well in every plate



Quantitative, whole well cell confluence for every well

Streamlined workflow: images, analyzes, reports

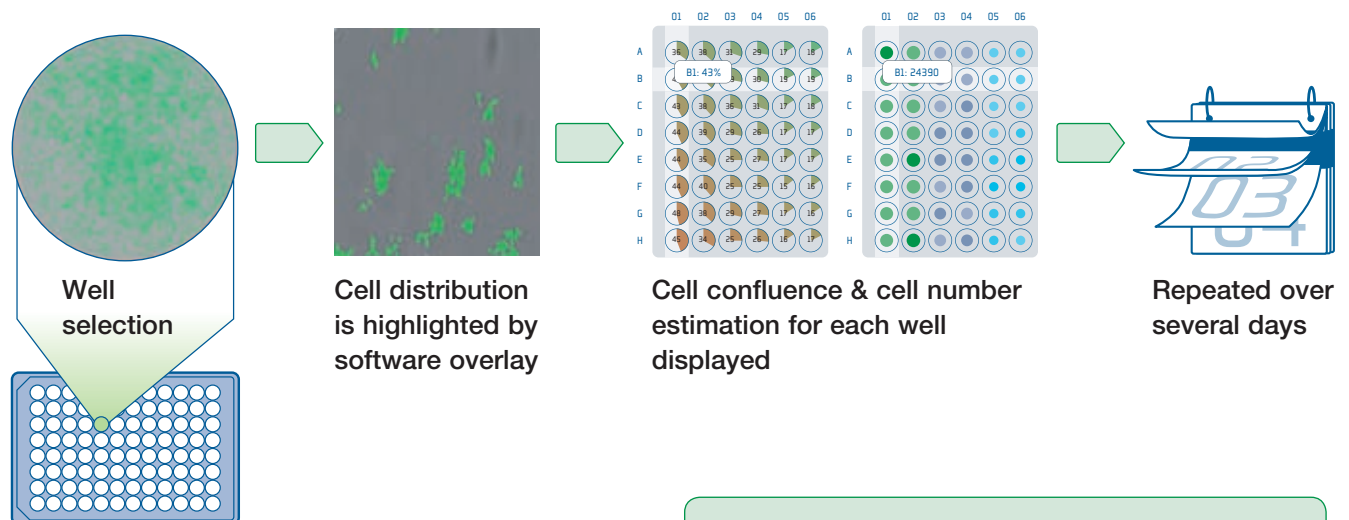
Imaging

- Use adherent or settled suspension cells in microwell plate



Analysis

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



Cloning new cell lines for target discovery and disease research

Track growth of cell lines for complete profiling

Idea

Report

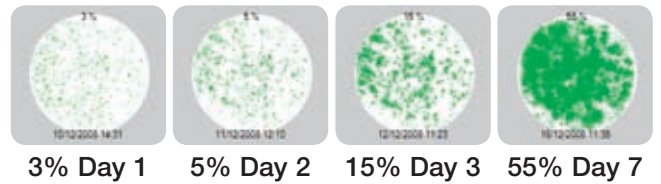
- Make confident, image-driven decisions throughout plate history
- Track and view growth of every cell line

Growth curves calculated and displayed

- Electronically track and store plate data
 - Cell confluence
 - Cell number estimation
 - Growth curve



Track colony outgrowth over 7 days – confluence overlay viewed for each imaging time point



Automate with robotic solutions

- Electronic data tracking ensures control of high throughput processes



CloneSelect Imager integrated with robotics from Beckman Coulter.

Photo courtesy of Beckman Coulter Corp., shows first generation CloneSelect Imager system



Process up to 75 lidded plates in a single run – *automate-it* scara robot is recommended and supplied through Molecular Devices – optimized for CloneSelect Imager

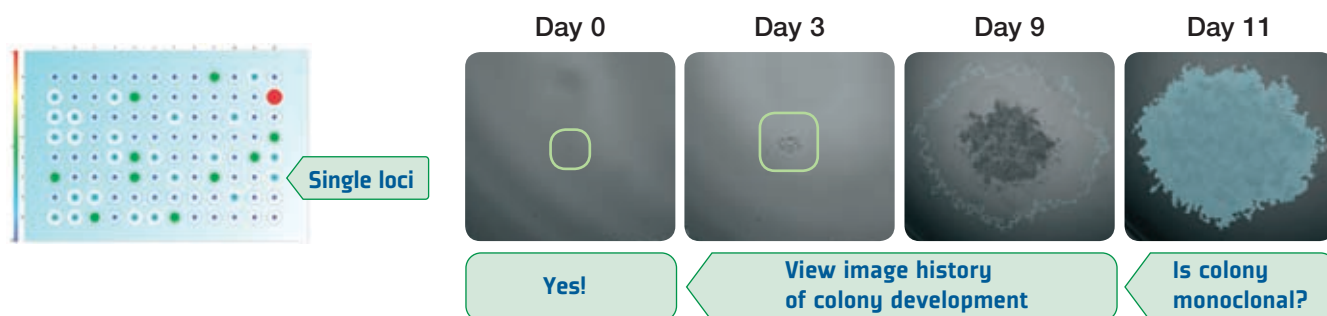
Verify monoclonality

After initial seeding, CloneSelect Imager system can image every well, at any time point, using a 'loci of growth' functionality to highlight those wells that contain a single colony.

- Seed one cell per well and image at any point
- Focus on wells with a single loci of growth and view image history to verify monoclonality
- Verify colony origin by tracking image history of each well

“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



Colony forming assay

After seeding in a matrix that enhances colony formation, such as a semi-solid media, cells are typically incubated with compounds that may affect colony growth. The CloneSelect Imager system is used to image every well to count colony number, estimate colony area and track colony growth.

- Image every well at any time point
- Analyze wells of interest e.g. showing inhibition of colony growth
- Export colony number and colony area for each well





Optimize cell culture conditions

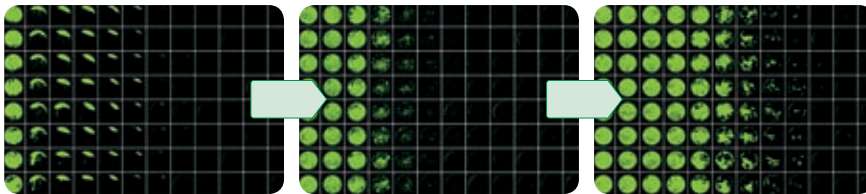


CloneSelect Imager has been used to rapidly screen culture variables to identify optimal culture conditions for low density or clonal outgrowth.

- Identify low-cell density growth conditions over a two-week period
- Achieve a robust and extended growth range over base-case data

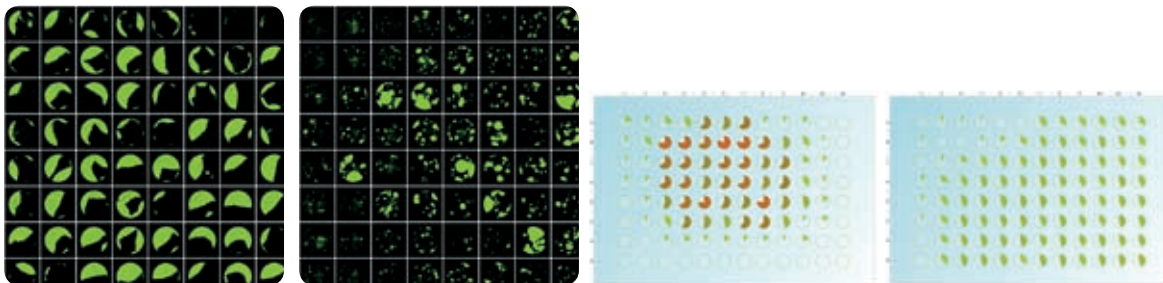
“Maximize success rate for serum-free colony outgrowth in chemically-defined media by prior optimization of growth conditions”

Ben Hughes, Senior Bioprocess Engineer, NCRIS Biologics Facility, Australian Institute for Bioengineering & Nanotechnology (AIBN), University of Queensland



Base-case – Day 7 data

Additional information gained on cellular morphology and understanding of growth characteristics



Identify multiple nucleation points versus “edge only” growth

Identify sub-optimal environmental conditions or “edge-effects”

Assess cell viability

Replace cumbersome colorimetric MTT assays with a non-invasive technique that enables monitoring over time*

- Direct overview of initial results per well
- Screen one microplate within 3 minutes
- Avoid costly colorimetric kits – no staining required

*Accurate non-invasive image-based cytotoxicity assays for cultured cells, Marques-Gallego et al., BMC Biotechnology 2010, 10:43



Accelerate cell line development

Monitor and evaluate outgrowth and productivity of cell lines that have been screened and selected using a ClonePix™ system.



Unrivalled solutions based on excellent imaging and intelligent image analysis

Products from Molecular Devices offer scientists unrivalled solutions that utilize imaging and intelligent image analysis to support basic research, pharmaceutical and biotherapeutic development. The company's systems continue to establish industry standards in areas such as picking microbial colonies for genomic studies or screening and selection of mammalian cell lines. Other systems use imaging platforms to monitor cell growth, evaluate cellular responses and quantify

protein production. Through its expertise in robotics, cell and molecular biology, image analysis and interpretation, supported by a strong IP portfolio, the company is committed to the continual development of innovative solutions for life science applications.

For more information, visit
www.moleculardevices.com/genetix

System Specifications

Imaging	CloneSelect Imager
Software	Dedicated imaging software pre-installed on a high specification PC, Microsoft Windows 7
White light imaging	Trans-illumination
Data tracking	1 x internal barcode reader for data tracking of each plate
Camera	Integrated 16-bit cooled CCD camera
Imaging speed	96-well microplate: 2.5 min
Resolution	Standard: 3.6 micron; Maximum: 1.8 micron
Instrumentation	
Source plate type	1-, 6-, 12-, 24-, 96-well microplates
Source plate capacity	1 x plates
Instrument dimensions	720 mm (width) x 428 mm (height) x 575 mm (depth)
Instrument weight	45 kg
Integration	OEM integration kit available
Regulatory approval	
	CE marked
Automation option	
automate-it scara robot	470 mm Z-travel, includes 1 cassette (capacity 25 lidded plates), holds up to 3 cassettes, compatible with CloneSelect Imager and CellReporter
automate-it scara robot cassette	Capacity: 25 lidded plates

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For a listing of trademark owners, visit
www.moleculardevices.com/genetix