CELLENION
A BICO COMPANY

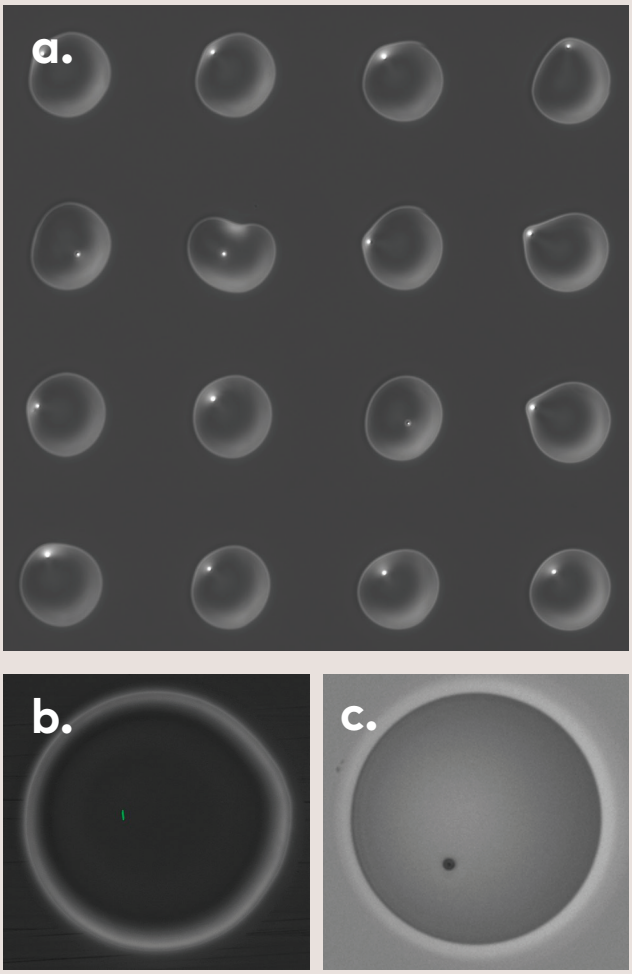
# CELLEN ONE
## for Microbiology

Highly versatile single microbial cell sorting, isolation and nanoliter liquid dispensing

# 1 Benefits

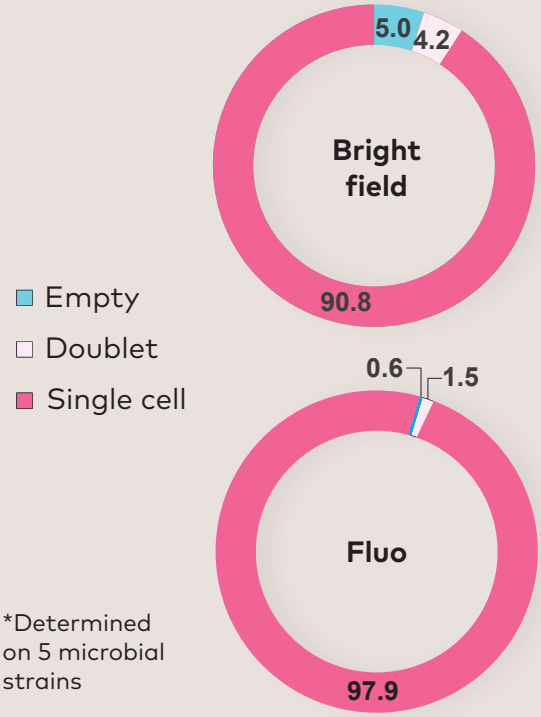
## Extraordinary cell versatility

A wide variety of microorganisms can be isolated using cellenONE®, including bacteria, yeasts, filamentous fungi spores, diatoms and microalgae... (and mixtures of these).




*cellenONE isolated cells in sucrose solution on microscope slides: a.* Saccharomyces cerevisiae, *b. Fluorescent* Bacillus subtilis, *c.* Aspergillus niger *spore.*

**Average detection accuracy (%)* with microLIFE software:**




*Determined on 5 microbial strains

## Unique single cell accuracy

- Best-in-class single cell accuracy for all types of cells
- 100% single cells for "big" microbes: fungal spores, yeast, microalgae... in both bright field and fluorescence modes
- With new microLIFE software, up to 96 and 100% for prokaryotes in bright field and fluorescence, respectively: no equivalent on the market!

## Key Features

Any cell type from microbial cells to large cells (0.5 - 80 µm)

100% single cells

Combined with nanoliter reagent dispensing

Optional integration Class II Biosafety Cabinet for sterility

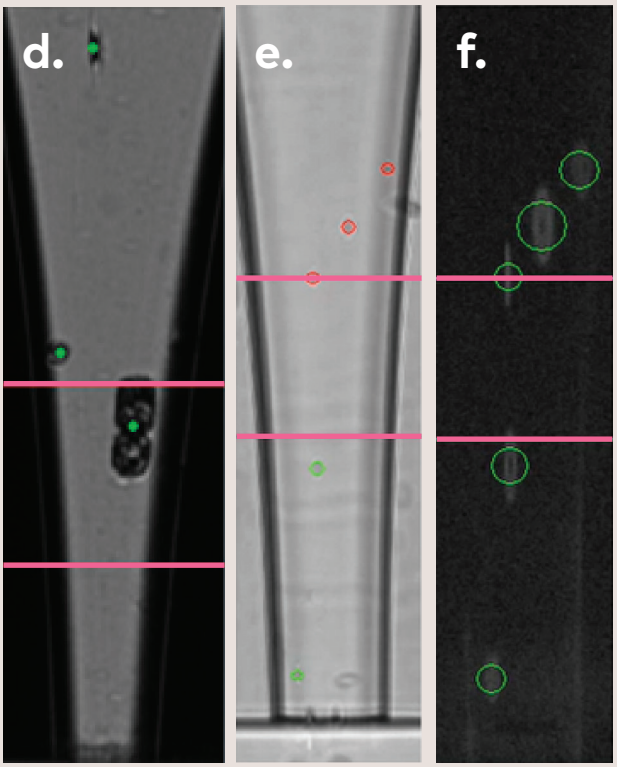
# Image-based cell isolation

- User-defined sorting parameters (morphology and/or fluorescence)
- 4-channel fluorescence (DAPI, FITC, Cy3, Cy5)
- Assurance of monoclonality: recorded images of every isolated cell and automated PDF report
- Immediate visual feedback on sample preparation (e.g. presence of host cells, debris etc...)
- Link phenotypic and morphological information with omics data

# Use any target labware

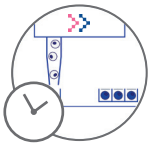
- Microorganisms can be isolated onto or into any consumable: MTP, petri dish, microscope slide, etc.
- Very high positional precision of cell isolation and reagent dispensing onto custom chips and microdevices

*Example of microbial cells in cellenONE capillary: d. mix of* Alexandirum minutum microalgae *and* Thalassiosira weissflogii *and* Lauderia sp. *diatoms in bright field, e. GFP-expressing* Escherichia coli *in bright field, f. same field as e, in green fluorescence channel.*



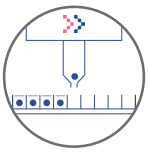

# Nanoliter liquid dispensing for reaction miniaturization

- Small droplet volume (150 to 600pL)
- High precision nanoliter volume reagent dispensing (<0.2% CV)
- Compatible with a wide range of reagents (incl. culture media, molecular biology reagents...)
- Temperature and humidity control to prevent evaporation and enable on-deck incubations

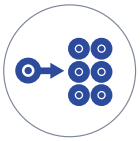


High throughput: Isolate up to 96 cells in less than 3 minutes

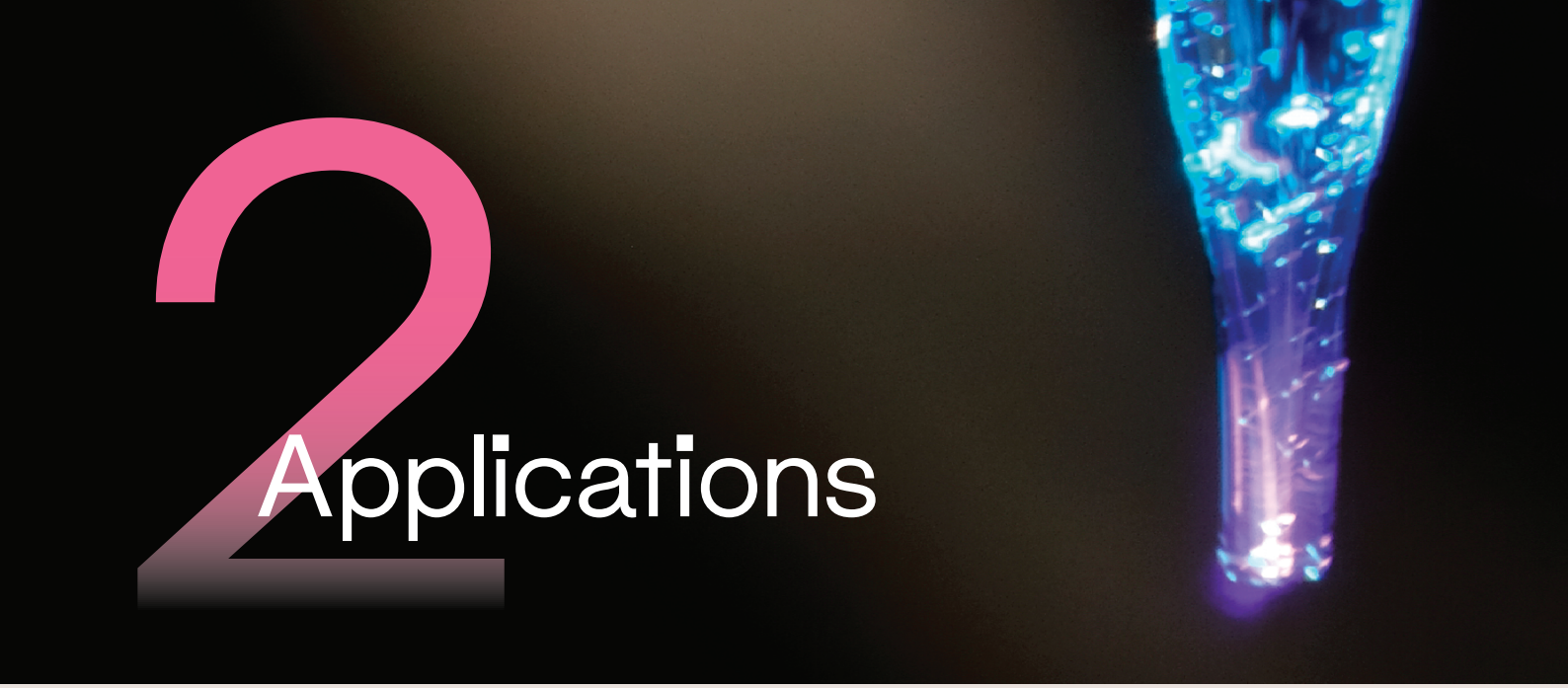
Image recording of every cell



Fluorescence and brightfield image-based sorting



Best clonal outgrowth rate



# 2 Applications

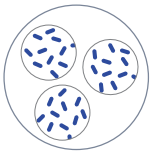
## Single-cell approaches in microbiology

cellenONE® is suited to sort and isolate microorganisms for both culture-based applications and single cell omics analyses:

- Automation of culture-based approaches for high throughput generation of isolates (culturomics) or clones (bioengineering)
- All microbial single cell omics approaches, for both academic and industrial applications, including single-cell Whole Genome Sequencing (scWGS), transcriptomics (scRNA-Seq) and proteomics (scMS)
- Access to rare microorganisms, understanding microbial dark matter, discovering new metabolisms
- Finer resolution of metagenome assembled genomes (MAGs), thanks to controlled mini-metagenomics
- Monitoring of genome evolution and horizontal gene transfer at the individual cell level (evolutionary studies at the intra-population level of diversity, monitoring of bioreactor inoculum stability, etc.)

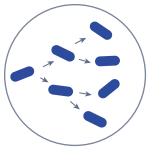
scWGS

scRNAseq



Minimetagenomics

sc-MS

Cloning

Culturomics

Synthetic communities

Metabolic screening

# Unlock the throughput of pure culture library generation with direct cell isolation in liquid medium

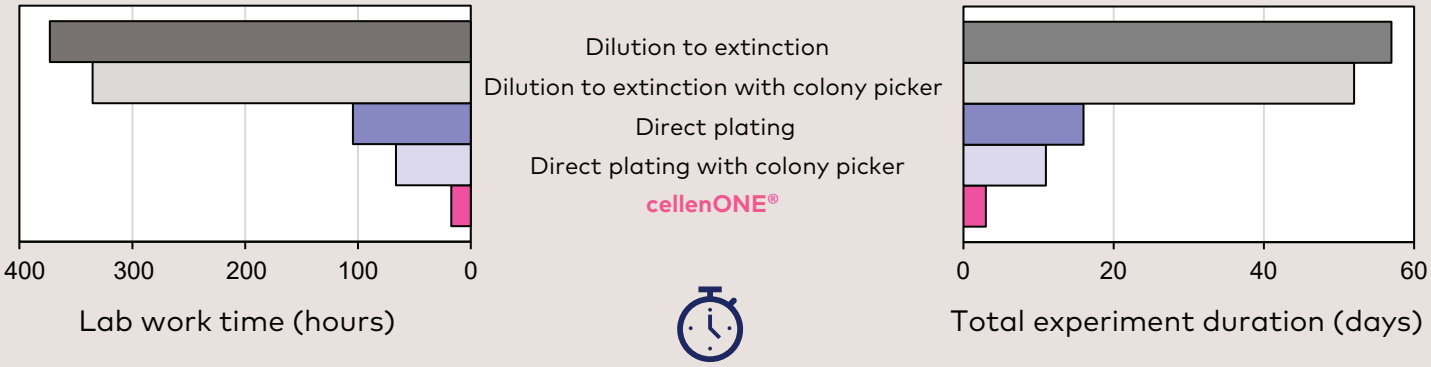
**Automated isolation: reduced handling time**

**Direct in liquid, no Petri-dish nor picking steps required**

**Demonstrated outstanding cultivability**

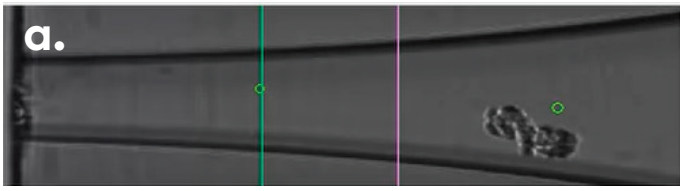
**Scale up the generation of pure isolates!**

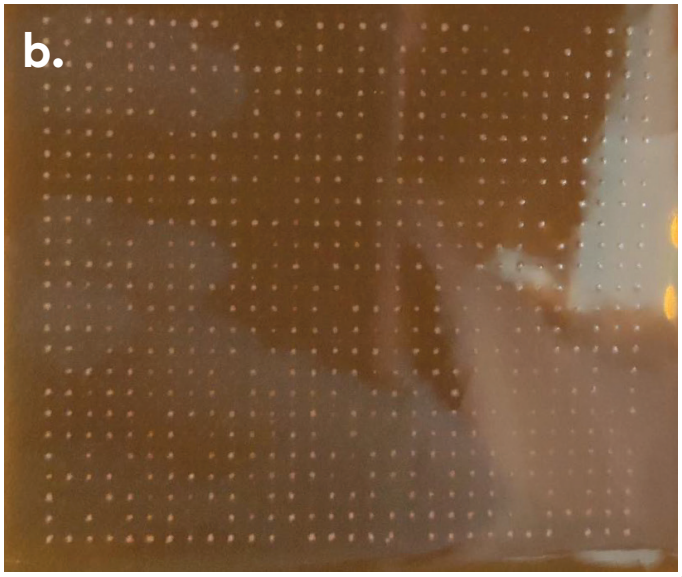
## Example for 1000 clones from each of 100 samples




## Empowering host-microbiota interaction studies

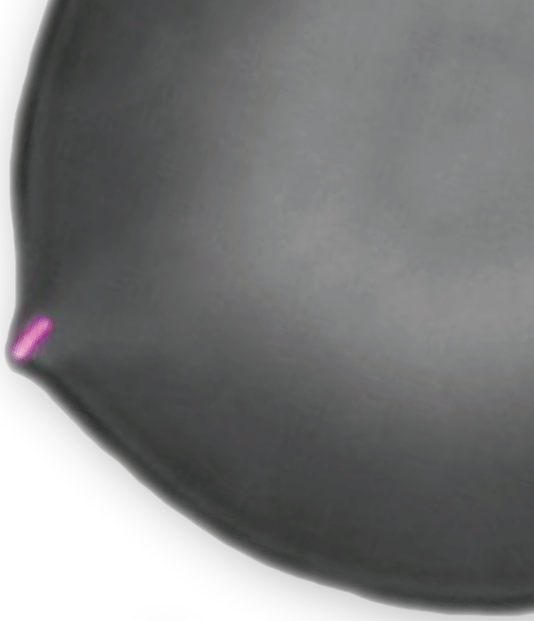
- Unique capability of handling both host and microbial cells at the same time!
- Build synthetic holobionts, with demonstrated outstanding clonal outgrowth for microbial and host cells
- Large cellenONE user community and dedicated kits (cellenCHIP 384 3'RNA-Seq Kit, proteoCHIP) for mammalian cells




*cellenONE-processed vaginal swab sample: a. human squamous cell and associated microbial cells in the cellenONE capillary, b. colonies formed from cellenONE-isolated vaginal microbial cells*

# 3 Technology

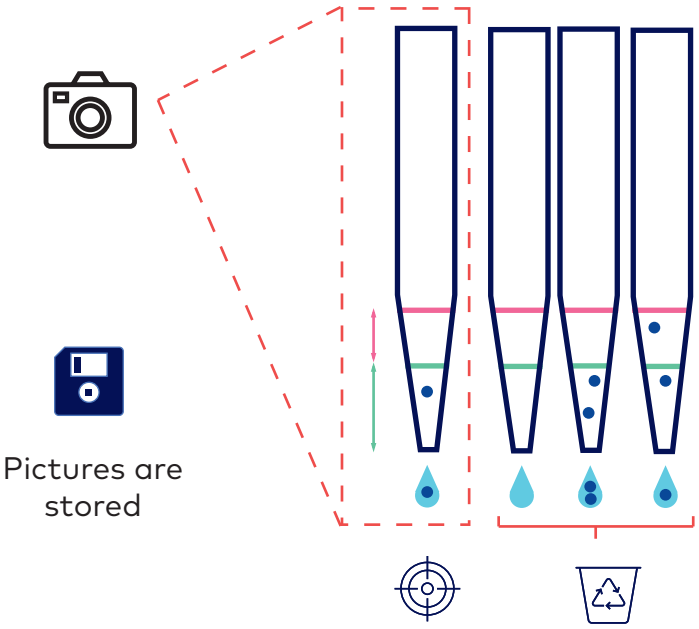


Piezo-acoustic droplet generation for ultra-gentle cell isolation.
Image-based, multi-parameter detection and sorting.

## How it works

1. Cell suspension is loaded in a cellenONE glass capillary
2. Capillary tip is placed in front of an optical system
3. Capillary tip is segmented into two zones

**Ejection Zone:** volume corresponding to the next generated droplet
**Sedimentation Zone:** safety zone considering possible cell sedimentation




4. If the next droplet contains only a single cell that fits user-defined parameters (size, fluorescence markers), it is dispensed into target labware. Otherwise, it is dispensed into a recovery vial allowing reprocessing.

# Technical Specifications

| | |
|---|---|
| **Sorting technology** | Image-based, brightfield and/or (multi) fluorescence |
| **Fluorescence channels** | Blue (ex.375nm; em. 432nm); green (ex.490nm; em.515nm); orange (ex.565nm; em.580nm); red (ex. 625nm; em.670nm) |
| **Dispensing technology** | sciDROP PICO: 150-600 pL / single drop in air |
| **Number of dispensing channels** | Up to 2 |
| **Spottable area** | 252 x 112 mm |
| **Dimension and weight with enclosure** | Standard version: 1300 x 700 x 1590 mm (L x W x H) with screen arm open - approx. 242 kg<br>BSC version: 2000 x 1000 x 2330 mm (L x W x H) with screen arm open - approx. 535 kg |

# Related products

**cellenONE® X1 BSC** is mounted in a class II Bio-Safety Cabinet (BSC) for a completely sterile working environment, to preserve sample and operator integrity.


**cellenONE® HT** is a true walk-away solution for high-throughput isolate library generation with automated sample loading, plate shuffling, and API software for integration with other automated devices.

## Want to see cellenONE in action?

Book a demo through our website!

cellenion.com

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