CellSorter

SINGLE CELL ISOLATION TECHNOLOGY

based on computer vision

ROBOT ISOLATING SINGLE CELLS ON A MICROSCOPE

TO DISCOVER SINGLE CELL GENETICS AND MORE

MAIN FEATURES

- Fast single cell isolation directly from the Petri dish
- Viable cells after sorting. One single cell arrives to each PCR tube
- 10 PCR strips containing 80 tubes can be filled in a cycle
- Number of cells picked up in a single run: 1-1000
- Glass cover slip for testing single cell deposition in situ
- Drop volume less than 1 µl for adherent cells
- Pick up volume of ~1 nl for suspended cells
- Speed: 3-4 cells/min. When collecting multiple cells, sorting speed is 1 cell/second
- Both unlabeled and fluorescent cells are recognized by computer vision
- Sort cells labeled by fluorescent molecular probes or markers
- Multichannel detection using the fluorescent filter setup of the microscope

VERSATILITY

For single cell DNA/RNA sequencing, CTC detection or protein engineering

PHENOTYPE BY MICROSCOPY

GENOTYPE BY NEXT GENERATION SEQUENCING

IMAGE, ISOLATE, SEQUENCE

Highly modular setup enabling a wide range of imaging modalities including super resolution microscopy and high content screening. Sequence exactly that cell you need.

PRECISION

High resolution imaging combined with computer vision for cell selection

EFFICIENCY

Advanced micropipette technology for single cell manipulations

INSTALLATION AND SERVICE

On-site installation and hands-on training, Long term technical support incl. free software upgrades. Annual service available

SCIENTIFIC REFERENCES

Z. Környei et al.: Cell sorting in a Petri dish controlled by computer vision, Nature Scientific Reports 3, 1088 (2013)

R. Salánki et al. : Single cell adhesion assay using computer controlled micropipette, PLoS ONE 9(10): e111450 (2014)

R. Ungai-Salánki et al.: Automated single cell isolation from suspension with computer vision, Nature Scientific Reports 6, 20375 (2016)

A . Kozlov et al.: A screening of UNF targets identifies Rnb, a novel regulator of Drosophila circadian rhythms, The Journal of Neuroscience 7, 3286-16 (2017)

K. D. Piatkekich et al.: A robotic multidimensional directed evolution approach applied to fluorescent voltage reporters, Nature Chemical Biology (2018)

CellSorter

CELLSORTER
Company For Biotech Innovations

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COMPONENTS

PRECISION & RELIABILITY

- CellSorter control unit with 2 high speed fluid valves
- USB connection to the computer
- High precision micropipette holding console manufactured from hard aluminum
- LED illumination for micropipette focusing
- Manually rotatable arm connected to the motorized micromanipulator
- High speed motorized vertical micromanipulator
- Manual horizontal micromanipulator for aligning the micropipette
- Special aluminum sample holder fitting to the microscope stage with a hole and magnetic fixing ring for the 35 mm Petri dish and 80 holes for 10 PCR stripes
- 32x24 mm^2 glass cover slip for in situ testing and high resolution imaging
- Borosilicate glass micropipettes
- Accessories, fittings and tubing for liquid control

OUR TECHNOLOGY

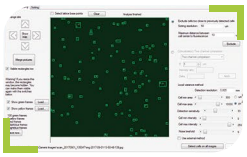
MODULAR SETUP
HIGH SPEED VALVE CONTROL
COMPUTER VISION
SOFTWARE
MICROFLUIDICS AND MICROPIPETTES

MODULAR SETUP

- CellSorter control unit and microfluidics
- Compatible with most inverted microscopes, e.g., Zeiss, Nikon, Olympus or Leica
- 2D motorized stage
- 1D motorized micromanipulator
- Micropipette holding arm
- Digital camera
- Syringe pump
- Desktop computer or laptop

HIGH SPEED VALVE CONTROL

- CellSorter control unit with 2 high speed fluid valves
- Nanoliter scale precision
- USB connection to the computer
- Simple installation
- Flexibility. It can be applied in a range of single cell experiments
- LED illumination for the micropipette



COMPUTER VISION

- Exceptional cell recognition efficiency
- Detects unlabeled cells in phase contrast images
- Cell detection can be optimized in less than a minute
- Recognizes fluorescent cells in multiple channels
- Two-channel comparison
- Cell size and brightness can be selected
- Compatible with external cell detection algorithms

SOFTWARE

- Intuitive graphical user interface: single cell sorting is fun
- User friendly structure with brief tutorials
- Saves all data for further analysis or publication
- Live view camera image for documenting the experiment
- Can control most microscopes, cameras and motorized stages compatible with the open source Micro-Manager software
- Runs on MS Windows OS

MICROFLUIDICS AND MICROPIPETTES

- Inert PTFE tubes and sealing for clean and sterile sample handling. Reliable PEEK connectors
- Calibrated borosilicate capillaries developed for single cell sorting. Aperture: 5-70 µm
- Optimal micropipette size can be chosen depending on your specific application
- Tip of the micropipette is fire polished to provide a smooth rounded surface for the gentle handling of cells

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