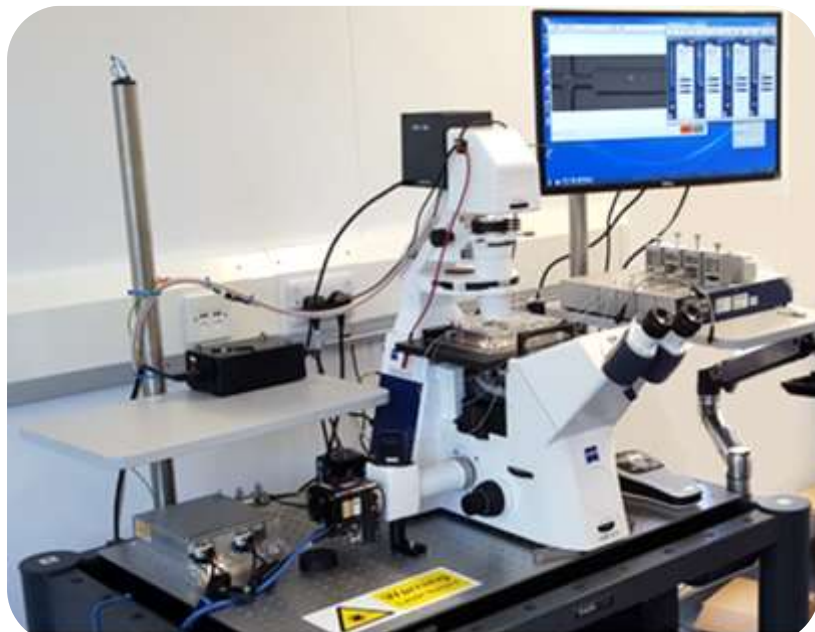


Picodroplet Single Cell Assay and Isolation System



Key Features

- Semi-automated, modular system for analysis of single cells or biomolecules in picodroplets.
- High-speed processing, detection and sorting of picodroplets (up to 18,000 per minute).
- Enables sensitive detection of secreted proteins (*e.g.* antibodies, growth factors, cytokines, enzymes, *etc.*).
- User-defined microfluidic flow rates.
- Range of optical detection methods (fluorescence, luminescence and scatter).
- Wide range of picodroplet sizes and volumes.



Figure 1: Pico-Gen™ biochip for picodroplet generation.

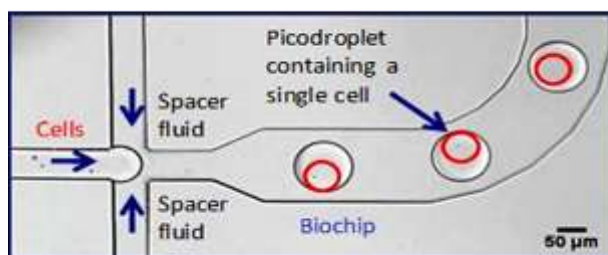


Figure 2: Production of picodroplets containing single cells.



Figure 3: Novel biocompatible surfactants (Pico-Surf™) stabilise picodroplets for many days.

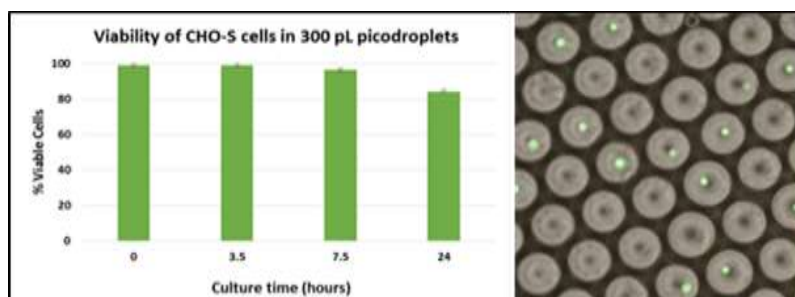


Figure 4: Viability of CHO-S cells in picodroplets incubated over a 24 hour period.

Example Applications

Biopharmaceutical discovery:

Antibody (transcript) discovery from primary plasma cells, B-cells or hybridomas.

Bioprocessing:

Rapidly identify and isolate high expressing clones.

Diagnostics:

Detect and assay circulating tumour and other disease-related cells.

Drug-resistance studies:

Identify and isolate rare drug-resistant cells from large microbial or cancer cell populations.

Enzyme evolution:

Screen millions of enzyme constructs to select the most efficient variant.

Synthetic biology:

Study vast numbers of valuable molecules produced by libraries of engineered microbes.

Note: This system is for research applications only

SPECIFICATIONS	
Sample input format	Syringe pumps
Sample input volume	50 µL – 1 mL
Workflows	Picodroplet fusion, assay and sorting
Detection system	Laser-induced fluorescence (e.g. autofluorescence, fluorophores, FRET) and light scatter
Throughput	Up to 300 picodroplets per second (picodroplet volume of up to 700 pL)
OPERATING CONDITIONS	
Continuous oil phase	50 µL/hr - 2000 µL/hr
Aqueous phase	5 µL/hr - 2000 µL/hr
Picodroplet volumes	0.2 pL - 1.7 nL
Picodroplet production rate	60 – 70,000 per second
SYSTEM SPECIFICATIONS	
Biochip compatibility	Pico-Gen™, Pico-Fuse™ and Pico-Sort™ biochips (these both require a Sphere Fluidics' Pico-Safe™ biochip holder), contact us regarding use with other biochips
Weight (approx.)	150 kg (330 lbs)
Dimensions (approx.)	230 cm x 170 cm x 80 cm (width x height x depth)
Voltage [frequency]	100 V (min) to 240 V (max) [@ 50 Hz / 60 Hz]
Consumption	500 W (max)
OPTICS	
Laser Excitation Wavelengths	One of: 405, 491, 561 or 635 nm (two laser systems also available at special cost)
Detection Filters	One appropriate filter set, e.g. FITC, Cy3, Cy5 (additional filter sets available at a special cost)
Detection Wavelengths	Filter-dependent
PMT Spectral Sensitivity	230 nm – 920 nm
Camera	High-speed CMOS (800 frames-per-second (fps) at full 1280x1084 resolution. Higher speeds, up to 29,840 fps)
PC	
Computer	Dell Optiplex 7040 (8 GB RAM; 500 GB hard drive) or equivalent
PC Operating System	Microsoft Windows 7 Professional SP1 or newer edition
Monitor	Colour LCD (21")
External connections	4 USB; 1 Ethernet
System Control Software	Sphere Fluidics' Picodroplet Single Cell Assay System Control Software (LabVIEW™), neMESYS pump software, Phantom Camera Control (PCC) software
Data Format	.txt (ASCII text file)
WORK ENVIRONMENT	
Clearance	30 cm
Operating Temperature	21°C ± 5°C
Site preparation	See our Picodroplet SCA and Isolation System Site Requirements Guide
SPHERE FLUIDICS' CONSUMABLES	
Microfluidic biochips	Pico-Gen™ picodroplet production biochips Pico-Fuse™ picodroplet fusion biochips (available directly from Sphere Fluidics) Pico-Sort™ picodroplet sorting biochips (available directly from Sphere Fluidics)
Specialist chemicals	Pico-Surf™ surfactants for high quality and stable picodroplet formation Pico-Glide™ enables lower non-specific binding and improved microfluidic flows Pico-Break™ for rapid separation of cells or molecules from picodroplets

Ordering Information		
Description	Part number	For pricing and other information: Sales@spherefluidics.com Certain Sphere Fluidics' consumable products can be bought here: http://www.spherefluidics.com/store/
Picodroplet Single Cell Assay and Isolation System	S301	
Picodroplet Single Cell Assay and Isolation System Installation	S301N001	
Picodroplet Single Cell Assay and Isolation System (1 year) Warranty	S301W001	

SPHERE FLUIDICS LIMITED: The Jonas Webb Building, Babraham Research Campus, Cambridge, CB22 3AT, UK.

Tel: +44 (0)1223 804200 | Info@spherefluidics.com | <http://www.spherefluidics.com>