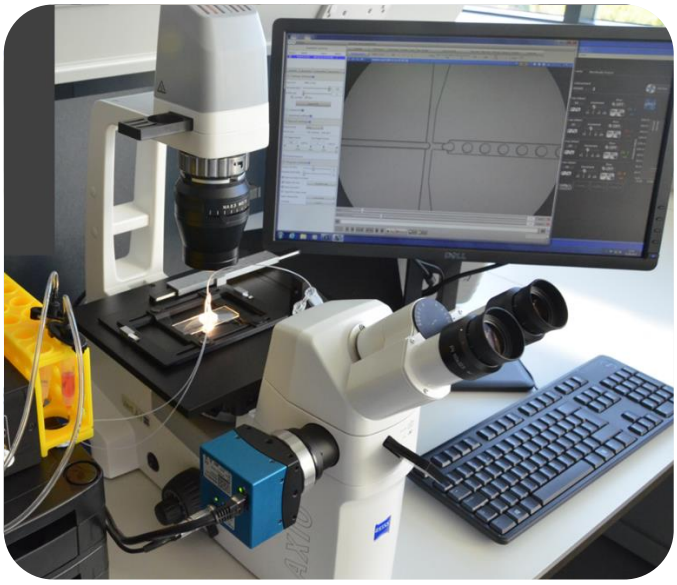
Picodroplet Single Cell Encapsulation System



Key Features

- Semi-automated, picodroplet generator.
- Encapsulation of single cells or biomolecules in picodroplets.
- High-speed generation of picodroplets (up to 70,000/sec).
- Parallel incorporation of probes and cells in picodroplets enables sensitive detection of secreted proteins (*e.g.* antibodies, growth factors, cytokines, enzymes, *etc*.).
- User defined microfluidic flow rates.
- Optical imaging of picodroplet generation for QA/QC.
- Wide range of picodroplet sizes and volumes.

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.

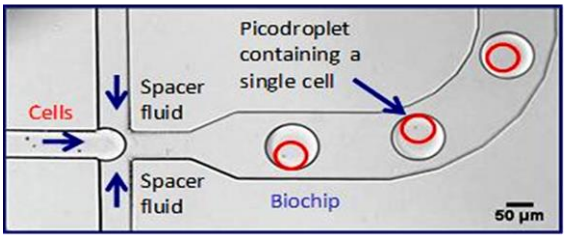


Figure 1: Production of picodroplets containing single cells.

Figure 2: Novel biocompatible surfactants (Pico-Surf™) stabilise picodroplets for many days.

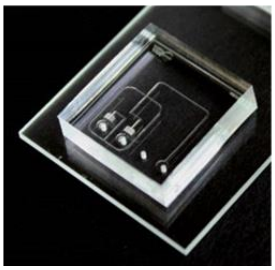


Figure 3: A Pico-Gen™ biochip for picodroplet generation.

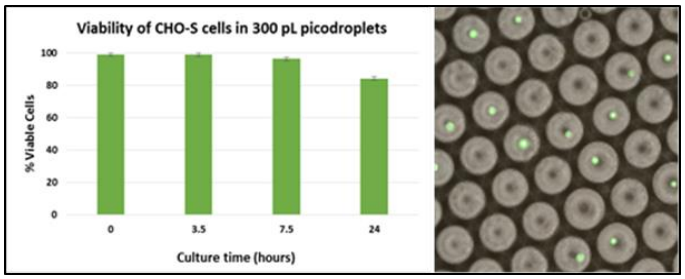


Figure 4: Viability of CHO-S cells in picodroplets.

Figure 5: *E. coli* proliferating in picodroplets.

***Note*: This system is for research applications only**

SPECIFICATIONS	
Sample input format	Syringe pumps
Sample input volume	50 µL – 1 mL
Workflow	Picodroplet production
OPERATING CONDITIONS	
Continuous oil phase	50 µL/hr - 2000 µL/hr
Aqueous phase	50 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™ picodroplet biochips (contact Sphere Fluidics regarding proposed use with other biochips)
Weight (approx.)	50 kg (110 lbs)
Dimensions (approx.)	130 cm x 60 cm x 60 cm (width x height x depth)
Voltage [Frequency]	110 V (min) to 240 V (max) [@ 50 / 60 Hz]
Consumption	300 W (max)
OPTICS	
Illumination	Halogen lamp (white light)
Camera	High-speed CMOS (1,696 pixels x 1,710 pixels) (500 fps at full resolution, up to 200,000 fps at reduced resolution)
Camera Spectral Sensitivity	400 nm – 900 nm
PC	
Computer	Dell Optiplex 7010 (4 GB RAM; 500 GB hard drive) or equivalent
PC Operating System	Microsoft Windows 7 Professional SP1
Monitor	Colour LCD (21")
External connections	2 USB, 1 Ethernet
Instrument Control Software	neMESYS Syringe Pump software, Camera software
WORK ENVIRONMENT	
Clearance	30 cm
Operating Temperature	21°C ± 5°C
SPHERE FLUIDICS' CONSUMABLES	
Microfluidic biochips	*Pico-Gen™ picodroplet production biochips
Specialist chemicals* *(*Can be purchased on-line at www.dolomite-microfluidics.com)*	*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 please contact us at: ***Sales@spherefluidics.com***
Picodroplet Single Cell Encapsulation System	SF-2014-100	
Picodroplet Single Cell Encapsulation System Installation	SF-2014-100i	
Picodroplet Single Cell Encapsulation System (1 year) Warranty	SF-2014-100w	

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