EXCELLENCE IN SCIENCE

THE ROYAL SOCIETY

Royal Society Enterprise Fund Investment Company

Sphere Fluidics Limited

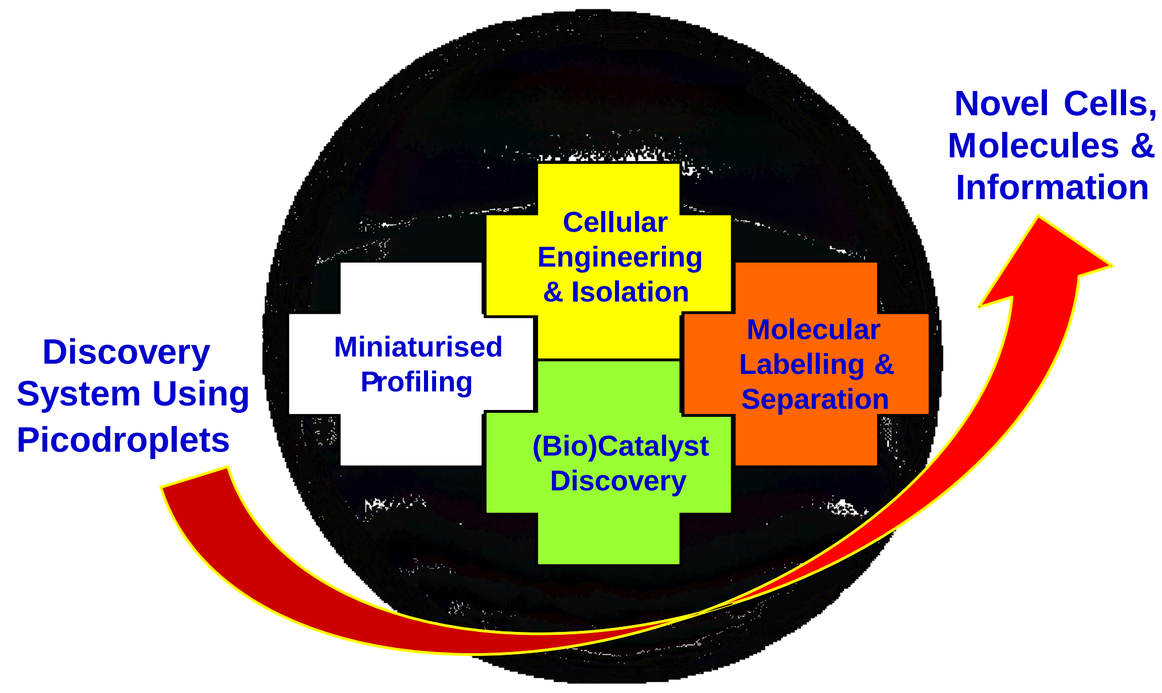
Sphere Fluidics

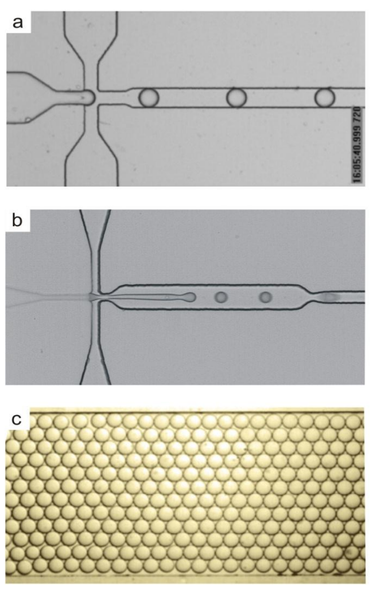
The Company:

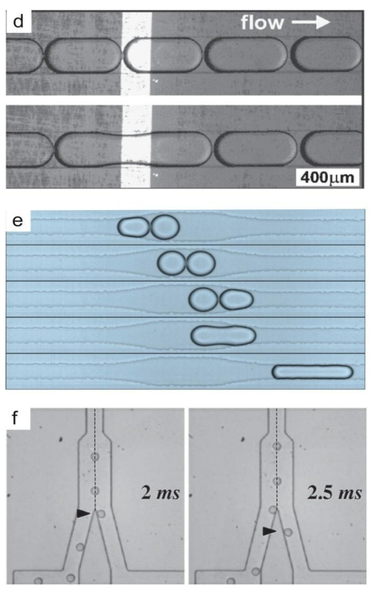
Sphere Fluidics is a new company targeting a combined market of £42 billion in the Biopharmaceutical, Chemical Sciences and Petrochemical industries. The Company is commercialising picodroplet technology from Cambridge University. Sphere's proprietary, discovery system can perform thousands of simultaneous reactions on single cells or (small populations of) molecules contained within aqueous droplets, fractions of a millimetre in size and with picolitre volumes. To date, Sphere has raised investment from the Cambridge Enterprise and the Royal Society Enterprise Fund and is now generating sales from its first Biopharmaceutical partnership.

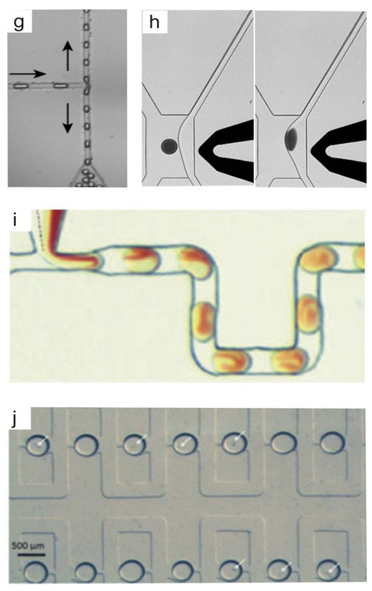
Science, Engineering and IP:

The technology platform includes novel microfluidics and chip designs for rapid creation, storage, analysis and separation of single cells or (small populations of) molecules. Integrated, detection systems include mass spectrometry and fluorescence for comprehensive, structural and functional analysis. Applications are shown in the diagram to the right. Microfluidic operations, picodroplets and single cells growing in picodroplets are shown below (left to right).







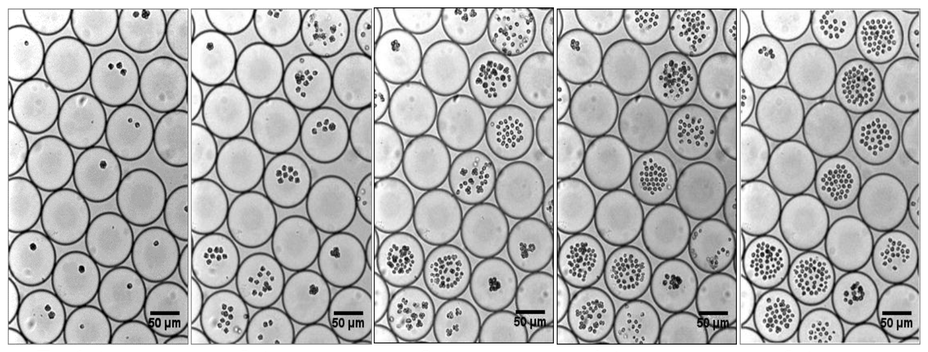


a) picodroplet formation
b) picodroplet formation
c) delay line/storage

d) fusion by electrocoalescence
e) passive (geometry) fusion
f) electrosorting

g) splitting h) separation
i) mixing
j) storage

Picodroplets being moved around via an oil stream in microfluidic channels



Growth of cells in individual picodroplets. Cells appear to grow and divide at similar or slightly faster rates when compared to conventional approaches. This is likely due to improved gas exchange in the picodroplet format.

Products and Services:

Products include: Generation and sale of picodroplet chips, surfactants and automated systems.

Services include: i) Selection of cell strains with a specific profile, *e.g.* a hybridoma that produces a specific antibody against a target of interest (Sphere does this in a few days versus months with conventional approaches).
ii) Rapid isolation of highly-active, specific enzymes or chemical catalysts from a large background number of clones or molecules.
iii) Isolation of microbial strains that secrete or generate high concentrations of valuable biodiesel precursors.

http://www.spherefluidics.com