InstaDROP

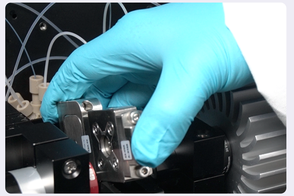
Plug, Set, Encapsulate

Scan me to discover
the full potential of the **InstaDrop**

Secoya
FLUIDIFY PHARMA

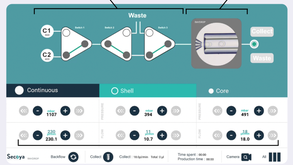
> Perfect control of emulsion production

The heart of the Instadrop is the Raydrop®, a patented microfluidic droplet generator that generates perfectly controlled single and double emulsions.
All the peripherals needed to operate the Raydrop are integrated into the Instadrop, making the production of complex emulsions easy.



Semi-automated process

Droplet size control (20 - 400 µm)



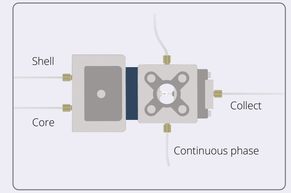
Easy flow and pressure set-up

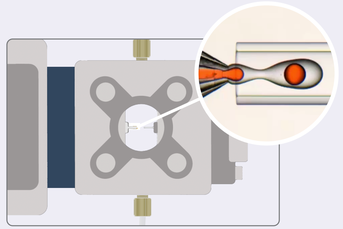
> Integrated platform for simple and double emulsion

The InstaDrop is designed to allow a fast and easy set-up for precise, repeatable and cost-effective encapsulation processes. This benchtop instrument is ideal for your developments in small molecules and biological material encapsulation.

> RayDrop® Simple & double encapsulation device

The way we produce droplets, particles and capsules relies on the use of couples of capillaries perfectly aligned in a metallic reservoir. The first capillary is terminated with a 3D-printed nozzle and injects the droplet phase in the junction.
The second one, placed in front of the nozzle, collects the emulsion towards the output. The process can be precisely controlled through the included touchscreen.



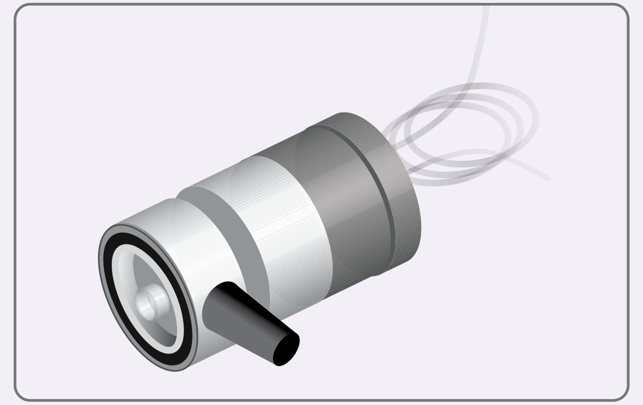


The RayDrop® is made of three metallic parts fully removable: two inserts on each side supporting capillaries and a central box with two glass windows for easy observation. The device is connected to fluid supplies and collection tubing by means of standard microfluidic tubing and nuts.

The droplets are produced by the controlled squeezing of the droplet phase by the continuous phase at the entrance of the collection capillary.

> Optional equipment

Rheodyne™ Sample Injector*

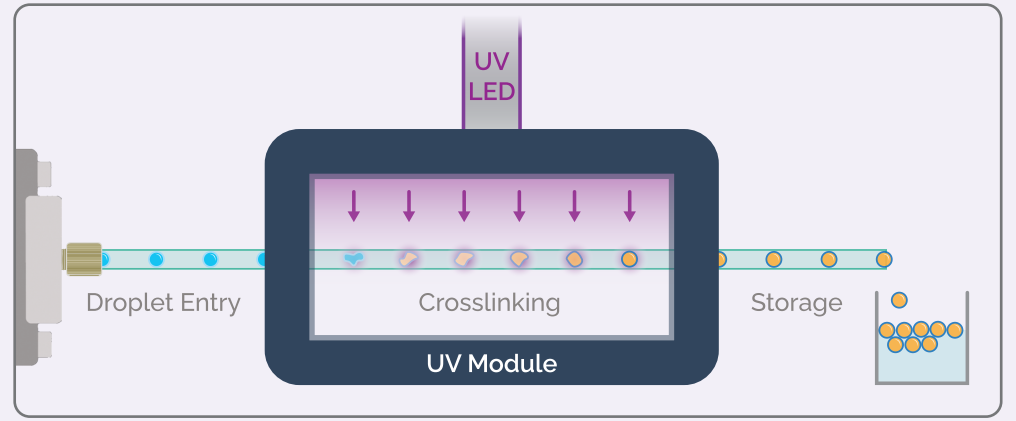


The Rheodyne™ sample injector allows a small volume of liquid to be loaded into a loop and then injected into the core or shell entry of the Raydrop®. During the injection step, the fluid from the loop is forced into the Raydrop® by the fluid coming from the core or shell phase reservoir.

Thanks to the injector, The InstaDrop is fully compatible with handling very small amounts of material. It is a must-have when you need to encapsulate an expensive or limited quantity sample, or when you need to screen a large number of conditions.

* Different sample loop volume are available, from 1 µL to 5 mL.

UV-Module



The optional UV module allows in-line crosslinking of droplets (single or double emulsion) of UV-sensitive material, so that solid beads and microcapsules with a solid shell and a liquid core can be easily produced. Droplets are insolated as they pass continuously through a glass capillary connected tothe output of the Raydrop®, thus avoiding coalescence problems during this critical phase.

> Unlock the potential of single and double emulsions with InstaDrop

Instadrop delivers precision and versatility in particle and encapsulation technologies, offering solutions for a broad range of industries:

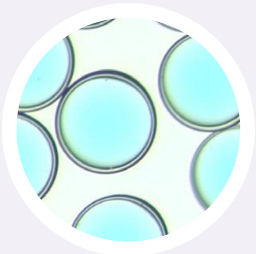
Monodispersed polymeric particles (e.g. PLGA, alginate, chitosan,...)
Achieve uniform, perfectly sized particles ideal for advanced drug delivery systems and controlled release applications.

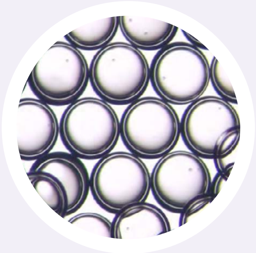
Formulation screening for small molecules and Active Pharmaceutical Ingredients
Safely encapsulate delicate actives like proteins, genetic material, fragrances... whether hydrophobic or hydrophilic, ensuring stability and functionality. By using the Sample Injector, a screening of a large number of formulations can be carried out with a small volume of material.

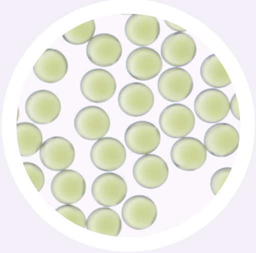
Encapsulation of insoluble actives
Overcome solubility challenges by encapsulating active ingredients that are insoluble in the polymer solvent, unlocking new possibilities in pharmaceuticals, cosmetics, and beyond.

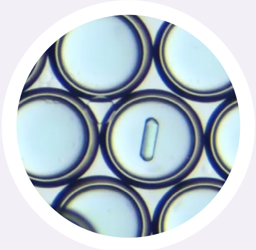
Cell culture and sorting
Encapsulate cells in polymer microbeads (typically hydrogels) to study their evolution under different conditions. Prior to FACS, encapsulate the cells to be sorted in a water-in-oil-in-water double emulsion. Very small volumes of cell suspension can be used thanks to the Sample Injector.

Crystallization screening
Thanks to the exchange across the porous shell of a microcapsule, crystallization conditions for a molecule initially in solution in the core can be determined and single mono-crystal formed inside the solid shell. The microcapsule is transparent to X-rays, making it compatible with XRD equipment. By using the Sample Injector, a screening of a large number of conditions can be carried out with a small volume of material.









> Specifications

The InstaDrop integrates everything required to generate microbeads and micro-capsules with the RayDrop®

Single and double emulsion production device	Compatible with any RayDrop® device
Fluid handling system	• 3 pressure controllers (0-7 bars) • Solenoid valves • Tubing: 1/16" PFA; 1/32" PEAK • 2 µm PEAK inline Filters
Reservoirs	• Continuous phase: 1*50mL Pcap with 50mL Falcon tube • Shell Phase: 2*15mL Pcap with 15mL Falcon tube • Core Phase: 2*15mL Pcap with 15mL Falcon tube
Flow meters	• Continuous phase: 0-1 mL/min (water) • Shell Phase: 0-120 µl/min (water) • Core Phase: 0-120 µl/min (water)
Optical system	• High power LED • Colour camera with microscopic objective • XYZ translation stages
Wetted material	• PP, FFKM, PFA, PEAK, GLASS, SS316L, PCTFE
Unit dimensions	• 85 x 51 x 48 cm (L x W x H)
Weight	25 kg
Power supply	230 V (110 V upon request)

UV-Module (option)

UV LED technology: 295, 305, 310, 325, 365, 385, 395, 405 nm (other wavelength available upon request)
Maximum irradiance at 10 mm : 150 to 1000 mW/cm², depending on the lens used
Spot diameter at 10 mm: 6 mm to 18 mm, depending on the lens used
Adjustable intensity from the touchscreen
UV-tight housing with windows for safe process monitoring

Sample injector

Type	Continuous Flow HPLC Sample Injector
Volume Sample	5 µL to 1 mL
Description	Dual mode; Continuous Flow; Posi-tion Sensing Switch
Stator Material	PEEK

About Secoya Technologies

Secoya is a company (ULB spin-off) based in Louvain La Neuve (Belgium) offering innovative solutions & equipment in particles engineering (Microfluidics) to the (bio)pharmaceutical industry from lab to industrial scale.

At Secoya Technologies, our experts in Microfluidic develop technologies and equipment by a smart use of micro-structured elements, enabling a faster, precise and secure development and production process. The company has unique expertise in crystallisation, emulsification/encapsulation,pervaporation, process intensification and conjugation.

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