



# MICROFLUIDIC DEVICE FOR ENCAPSULATION OF ACTIVE SUBSTANCES

## Ideas on utilisation

The subject of the technological offer is a device and a method for producing an innovative microfluidic device (chip), intended for encapsulation (closing) of active substances or living cells (including stem cells) and covering with a semi-permeable coating with controlled properties. The device is used for continuous and automatic production of monodispersion of microcapsules with a diameter of several dozen micrometres, enabling prolonged release of substances from their interior, e.g. medicinal, food, cosmetic products, etc.

## Potential adopters of technology

The technology offered is in the form of a prototype microfluidic device for the production of monodispersion of microcapsules with a controlled diameter and thickness of the coating, composed of a liquid core and a solid coating

## Advantages of technology

The main advantage of the technology is the ability to produce capsules with a diameter of 1-100 microns (the ability to precisely adjust the size of the capsule for use), which allows for allocation in selected tissues and organs. For example, in the case of pharmaceutical applications, capsules that are made and administered to a patient topically (e.g., injections) release topically therapeutic substances at the lesion site (topical effect), limiting side effects of the therapy for other parts of the body. Medicine in the form of capsules may, for example, be delivered directly into a tumor and released for a definite long period of time in a controlled manner with simultaneous closing (embolising) the microvessel lumen. This increases the effectiveness of the therapy while minimising its side effects.

The main advantages of LOC solutions are in particular: lower consumption of necessary components, shorter waiting time for the process result, higher precision of the result, better control of the manufacturing process.

## Market and context of technology

Microdevices prepared according to the subject method are used for encapsulation of active substances as well as continuous and automatic production of monodispersion of very small microcapsules.

The main markets for the technology applications are the following sectors: medicine and veterinary medicine, pharmacy, biotechnology, chemistry, material engineering, agri-food and cosmetic industries.

## Preconditions in adopting enterprises

Not expensive investment (for an established producer).