

## Co-operation profile details from Enterprise Europe SEIMED

### TOFR20180313001 - French Technology Transfer Office proposes a optical-driven tweezers with a haptic interface for micro-manipulation Technology collaboration OFFER

#### Abstract

The French TTO (Technology Transfer Office) is acting on behalf of an established public laboratory of the Paris region that has developed new optical tweezers for micro-manipulation with a haptic interface that allows to "feel" a single cell or a micro element. The French public research centre is looking for partners for a technical cooperation or license agreement.

#### Description

The French TTO (Technology Transfer Office) is acting on behalf of an established public laboratory of the leading French scientific based in the Paris region.

A French academic laboratory has developed a new optical tweezer for micro-manipulation that allows to "feel" a single cell or a micro element thanks to an innovative haptic interface with force feedback. The haptic interface allows manipulation in a 3D plan.

#### \*Market Challenges :

In micro-manipulation, "with contact" tools are less and less used because they are limited by attraction strengths and adhesion effects between the sample and the manipulator for elements smaller than 100µm.

That's why optical tweezers are now massively replacing those tools. Optical tweezers use a highly focused laser beam to provide an attractive or repulsive force. Optical tweezers have been particularly successful in studying a variety of biological systems in recent years.

Regarding particular uses, optical driven tweezers have some drawback :

- No force feedback allowing to detect, to hold and to release a micro object or a single cell. Which is necessary for a precise manipulation.
- No real-time monitoring for objects that can move at high speed in complex environments (dusts, shadows, dim light). But manipulators need real time measurement of displacement, velocity and acceleration of micro objects.

#### \*Innovative solution :

Therefore, a French laboratory has developed a new technology comprises :

- an asynchronous video camera for monitoring microscopic objects (from 500 µm to 200nm) moving at very high-speed, which is based on an innovative algorithm that can handle as well as shape recognition, monitoring of objects in contact with obstacles, defocusing and illumination variations.
- a high fidelity 3D haptic interface that allows micromanipulation with high-quality force feedback
- a micromanipulation workstation based on the principle of optical tweezers that can control a probe or micro gripper breads (polystyrene microbeads). The gripper breads can manipulate a single cell or a micropart.

#### \*Suggested applications :

- Atomic Force Microscopy (AFM)
- Micro manipulation & assembly for watch making
- Biology (cell handling, micro injection)
- Testing (fiber optics, wire bonding ..)

#### \* Partnership :

The French TTO is able to provide technical and legal assistance to facilitate the eventual partnership. In case of business potential, the prototype can be partially funded by the TTO.

The partner sought could be a company interested in :

- a license agreement as the TTO is ready to negotiate directly the patents rights for specific applications, or
- a technical cooperation agreement if the industrial application can benefit directly from the actual device

#### Target partner expertise sought:

- Specific area of activity of the partner: The partner sought could be a company interested in a licencing or a technological cooperation agreement if any fonctionnalities have to be added or modified. The eventual partner should have a clear industrial application in mind, and should have a strong technical background to co-develop the optical tweezers with the laboratory.

**Key information:**

Country of origin: FRANCE

Listed under: Ciencias de la vida

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