



BIOVISION The World Life Sciences Forum

Biovision Catalyzer
13-14 APRIL 2016



CELLENION

Endorsed by: We've been encouraged to take part in Biovision by Nathalie Laurent from ADERLY, Lyon.



Project holder : TOURNIAIRE Guilhem
Bioprinting and Single-cell dispensing

Organization : Cellenion SAS spin-off of SCIENION AG
France
cellenion.com (not yet created)

Brief summary:

To develop a world leader in controlled cell dispensing technologies with applications in the fields of bioprinting and single-cell dispensing.

Project / initiative description (context and objectives):

The goal of this project is to spun-off a company from SCIENION AG called Cellenion, which, will specialise in cell dispensing applications with two main topics of investigation:

1) Bioprinting:

Bioprinting is the process of generating spatially-controlled cell patterns using 3D printing technologies. Since recent directives to replace animal testing, the Cosmetic industry has been under huge pressure to develop reproducible skin models. Current techniques of skin model reconstruction and testing still rely on many manual steps that affect the reproducibility of the current models. Cellenion will aim toward both miniaturization and automation in order to produce reproducible models of different complexities.

Pharmaceutical R&D effort cost millions as a result of failure of certain candidates at late development stages. In this industry, there is a huge demand for more relevant *in vitro* assays in order to better screen potential compounds. However, most assays based on monolayer cell culture are known to lack the functionality of real tissues and provide only limited data regarding efficiency and/or toxicity of certain candidates. Human-cell based 3D *in vitro* models will provide better representation of human tissues and will eventually also allow a reduction in animal testing, which, are very expensive, tedious and also present their limitations.

2) Single-cell dispensing:

Ability to handle and dispense, on-demand, single-cell open a range of new opportunities in the booming field of single cell analytics and for the development and selection of novel cell lines.

Description of the existing or potential collaboration:

Since the creation of our laboratory, we setup a couple of collaboration with two different SMEs.

1) Skin model: Our first project involves the development of novel reconstructed skin models using our inkjet-based bioprinting techniques.

2) Cancer model: The second project aims to develop new tumor models where both the tumor and its stromal environment could be reconstructed by bioprinting in order to provide alternatives to current *in vitro* assays and animal-based PDTX models.

We are interested to setup collaborations with companies and research institutes having interests in the field of *in vitro* diagnostic, cell line development or single-cell analyses in order to undertake contracted or joint development programs.



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Project / initiative assets (type, innovation, level...):

The field of Bioprinting is still very much in its infancy but it has already raised lots of interests from major players from cosmetic and pharmaceutical industries. Indeed, l'Oréal, Roche and Pfizer are already collaborating with the leader in the field of bioprinting, California-based Organovo.

One of the huge advantage of Cellenion in this field is that we will be able to rely on already proven dispensing technologies and the huge amount of expertise acquired by SCIENION over the last 15 years. Cellenion will hold exclusive right to SCIENION's dispensing technologies for applications in the fields of cell dispensing.

Initial experiments have already proven the suitability of these inkjet technologies for dispensing cells with great precision, and more importantly, no toxicities. Our current printer have up to 8 dispensing channels which can allow for the fabrication of highly complex structures.

Bioprinting is a very multidisciplinary field that involves knowledge of biomaterials, cell biology, tissue engineering, automation and computing, with this in mind, the Cellenion project has recruited an international team of multidisciplinary scientists to overcome the challenges to come.

Societal benefits:

Novel 3D human cell-based assays will provide models for both cosmetic and pharmaceutical testing. These will provide better *in vitro* models (cf. existing monolayer culture) and also allow a reduction in the need for animal testing.

As our expertise develop in the fabrication of 3D tumor models, applications in the field of personalized medicine will also arise with the possibility of creating from a patient biopsy, patient-specific tumors and their stromal environment *in vitro* and subsequently screen for the most suited therapy, which, will allow an overall reduction in treatment costs but more importantly a better outcome for the patients.

Finally, bioprinting hold the promise to one day being able to fabricate a complete functional organ, such achievement will redefine the whole medicine paradigm as patients will be able to order specific organs instead of having to wait for years for a suitable donor as it is currently the case.

Planned schedule:

SCIENION setup a bioprinting laboratory in Meyzieu near Lyon in Q4 2015 for this Cellenion project.

In order to undertake initial proof-of-concept experiments, 3 staffs (1 manager and two senior scientists) have been recruited and are currently working in those facilities.

The company Cellenion SAS will be spun out of SCIENION AG in Q2 2016.

Scientifically, the focus for this year will be:

- to validate our initial applications
- to identify the limits of our current inkjet technologies applied to bioprinting applications
- to establish collaborations with private companies to develop new applications
- to setup long term relationships with our local ecosystem (universities, pôle de compétitivité, technical platforms, research institutes...)

Businesswise, 2016 will be the year to reach out for greater visibility in order to increase awareness toward our enterprise with the view of achieving a successful funding round in Q1 2017. We also aim to achieve successful applications to a number of funded collaborations for which we have already been applying in order to finance part of our ambitious R&D program.

What are you expecting from BIOVISION Catalyzer?

- 1 Meeting potential partners
- 2 Visibility
- 3 International reach
- 4 Other