

# Microfluidics

## Startup Identification – March 2020

*What are the startups that have emerged in Microfluidics?  
What are they working on? Who are the key people in these companies?*

### REPORT OUTLINE

- Microfluidics
- Startup Identification Report
- March 2020
- Ref.: KM20003
- PDF: 310+ slides
- € 1,990 for a multi-user license



### REPORT'S KEY FEATURES:

- **Identification of the startups** that recently started to work in the field of Microfluidics
- **Mapping** of the new startups
- Segmentation by **technology** and **application**
- **Focused analysis** of the projects aiming at **Oncology, Diabetes** and **Neurology**.
- **Description** of the startups and their microfluidic-related projects
- Presentation of **all their published patent families**.
- Description of **key people** and their background.

### This report will help you:

- Identify new business opportunities.
- Identify new competitors-to-be.
- Understand the evolution of key trends in IP and technology development.

### RELATED REPORTS

- [CTC: isolation & detection – Patent Landscape Analysis](#)
- [Nanopore Sequencing – Patent Landscape Analysis](#)
- [Artificial Intelligence in Medical Diagnostics – Patent Landscape](#)
- [Other relates reports](#)

### Over 50 startups working in the field of Microfluidics were identified

Microfluidics is a very dynamic technological field and the global microfluidics market is expected to grow and reach US\$ 42.17 billion by 2029, with a CAGR of 13.73% from 2019 to 2029 (BIS Research). Involving numerous technologies and having numerous applications (e.g. Healthcare, Biotech., the Environment, Microelectronics, etc.), this domain sees the arrival of numerous startups every year. In this highly diverse and rapidly changing ecosystem, it is crucial to identify new players and monitor their activities to determine opportunities, threats, potential partnerships and collaborations. Because of their small size and technological diversity, these young companies are hard to identify by conventional approaches (web searches, workshops etc.). In this report, Knowmade has therefore investigated Microfluidics-related patents in order to identify startups through their patent filings. **More than 50 startups incorporated between 2014 and 2019 were thus identified**, and for each of them, the report describes their main activity, products, patents, and key people among their staff. This study reveals that Oncology is by far the market explored the most by startups working in the field of Microfluidics. Diabetes, Neurology and the Environment are also markets of interest for some startups identified. The leading applications being Molecular Biology & Biochemistry assays, followed by cell separation & analysis, droplet processing and electrode-based biosensors.

### Why use patents to identify startups?



Startup identification



Technology assessment



Company's key people

**Detecting hidden companies** – Looking at patent documents makes it possible to identify companies that do not communicate much or even at all. It is a good way to detect companies that could not be found using more conventional methods (e.g. trade fairs, conferences, web searches, etc.).

**Assessing the technology** – Technology is one of the keys to a startup's success and being able to understand and assess it is highly valuable. The specification of a patent document includes a lot of technical information that can be used to determine the advantages brought by new inventions. The patent claims can also be used to determine the protection the applicant is asking for, and therefore where its interest resides.

**Identifying the key people** – The success of a startup is strongly linked to the team that composes it. It is therefore important to know the founders and inventors to assess the odds of its success. Patents enable the identification of inventors inside the companies. These inventors are technical experts who have laid the foundation of the technology the startup is developing. Describing the background of key people can help in understanding the startup project, and their history can reveal the extent of the know-how they have accumulated.

## Startup Identification

Startups have been identified by screening the patent documents published in 2019 claiming microfluidic technologies. For each startup identified, the report provides a complete description of its activity and products/prototypes. Its link to a university, information about funding rounds and government/agency grants or subsidies are also described.

### Xsensio

#### Company & Product description



Xsensio ([xsensio.com](http://xsensio.com)) is a Swiss company founded in 2014. It is a spin-off company from the Swiss Federal Institute of Technology's Nanolab. It is currently hosted at the EPFL Innovation Park.

The company is developing a sensing chip designed to be placed on a user's skin. Comprising microfluidic features, the chip is a sweat sensor that can analyze chemical compounds present at the surface of the skin. The data can later be used for healthcare or wellbeing purposes.

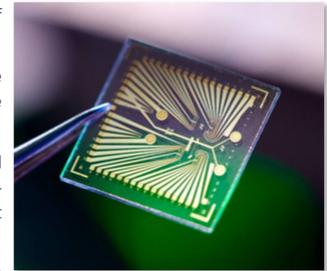
The company was granted a CHF 500,000 (about € 463,000) [Growth loan](#) by the Foundation for Technological Innovation (FIT) of the canton of Vaud (Switzerland) in February 2019. According to the loan announcement, the Lab-on-Skin™ technology will allow users to “enjoy real-time personalized data, which will allow them to detect dehydration, fatigue or muscle cramps, for example, or even later to inform them about disease risk factors.”

On November 11<sup>th</sup> 2019, the company announced that Lab-on-Skin™ received a [CES 2020 Innovation Award](#) in the Wearable Technologies category.

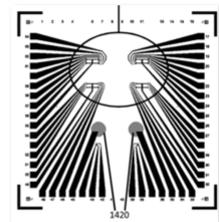
The company is developing a lab-on-chip technology for sweat sensing, which it has named Lab-on-Skin™.

This technology is thought to be used in multiple form factors: in a skin patch, in parts of wearables that are in contact with the user's skin. The company announced that its technology features the following specifications:

- A high miniaturization level with a sensor density of 100,000 sensors per mm<sup>2</sup>.
- High sensitivity (sub-picomolar sensitivity).
- It requires a low volume of sweat (a few nanoliters), so it does not need to stimulate sweating to work.
- It has been designed to be produced using semiconductor fabricators, making its manufacturing process highly scalable.



Lab-on-chip illustration on Xsensio's website © Xsensio



Lab-on-chip illustration from Xsensio's last published patent application (WO2019/170776, figure 14)

## Patent Description

This report includes a detailed description of all the patents filed by identified startups. The elements provided in each overview slide provide essential information to quickly understand the patented technology. For each patent family described, the publication number of Granted/Registered and Pending members are provided, as well as the main claim, the alleged technical advantage provided by the invention and the most relevant figure explaining how the invention can be carried out.

### Xsensio

#### Patent description (1/3)



Title	Apparatus for non-invasive sensing of biomarkers in human sweat		
Inventor(s)	IONESCU Mihai Adrian, LONGO Johan Frédéric, WILDHABER Fabien Patrick, GUÉRIN Hoël Maxime, BELLANDO Francesco, CORDERO Erick García		
1 <sup>st</sup> priority date:	2017-10-16	1 <sup>st</sup> publication date:	2019-04-18

Legal status	Granted	No granted patent yet
	Pending	US2019/0110722, WO2019/076733

#### Claim 1 (US2019/0110722 A1):

A biofluid collection and sensing device, the device comprising:  
 an interface and/or interface surface comprising at least one biocompatible material for contacting a body part;  
 at least one inlet for receiving a biofluid;  
 at least one outlet for evacuating the biofluid;  
 a plurality of semiconductor sensors for detecting one or more biomarkers in the received biofluid;  
 and  
 at least one microfluidic and/or nanofluidic channel in fluid communication with the at least one inlet, at least one sensor of the plurality of semiconductor sensors, and at least one outlet.

#### Alleged technical advantage(s):

The invention disclosed herein provides skin patches and wearables with sweat sensing capabilities. The provided devices being used for the continuous and non-invasive detection of biomarkers that are present in the sweat.

#### Other key element:

This patent family is assigned both to the École Polytechnique Fédérale de Lausanne (EPFL) translated Swiss Federal Institute of Technology and Xsensio. Later patent families are only assigned to Xsensio.

**Key figure:** Schematic diagram depicting the design of a biofluid collection and sensing device that includes multiple microfluidic layers for biofluid collection and channeling.

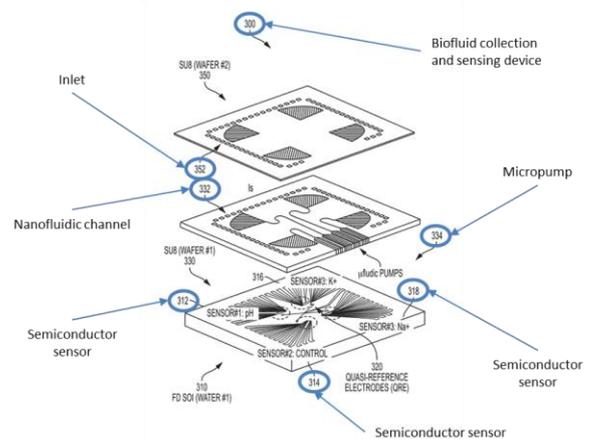


FIG. 3

## Key People Description

This report includes a description of the key people involved in each selected startup. Knowing the key people behind a startup helps assessing its chances of success by determining their individual strength and their complementarity. This report is focused on the description of the people who have a technical background. For each key person, the report shows a summary of their educational background, employment history, as well as a short description about their patents and scientific publications.

### Key People Description



**Sanne XXXXX**, Research Associate in Pre-clinical Development at Company XXXXX

Ms. XXXX holds a BSc in Medical Technologies (2012) from Plantijn Hogeschool and an MSc in Biochemistry and Biotechnology (2015) from the University of Antwerp. Ms. XXXX worked at Janssen Pharmaceutical (part of Johnson & Johnson) as an Associate Scientist (from August to December 2015) and as a Scientific Assistant (from January to June 2016). In June and July 2016 she worked as a Lab Technician for LabCorp Clinical Trials before joining Company XXXX in August 2016 as a Research Associate.

- She is named inventor on the extended patent families assigned to Etherna Immunotherapies ([WO2019/141814 Lipid nanoparticles](#)).
- She co-authored 3 scientific publications related to mRNA-based immunotherapies.



**Steven XXXXXX**, CEO of Company XXXXX

Dr. XXXX holds a BSc in Microbiology (1982) from the University of Wales at Swansea and a PhD in Microbiology (1985) from the University of Aberdeen. From 1992 to 1997, Dr. XXXX held his first Management positions. In 1997, he began working in his first Corporate Management position at Actinova. He currently holds three positions. He is Non-Executive Chairman at Cambridge Cognition since August 2014, Chairman at The Native Antigen Company since November 2014 and CEO of Company XXXX since November 2018.

- He is named inventor on a patent family ([WO01/04345 Method of differentiating between bacterial and viral infections](#)).
- He co-authored 6 scientific publications while he was at the University of Aberdeen. The main topic of his work was the effects of nitrapyrin on the growth of *Nitrosomonas europaea*.

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## AUTHORS



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### Brice Sagot, PhD

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## ABOUT KNOWMADE

Specialized in the analysis of patents and scientific information, Knowmade provides technology intelligence and IP strategy consultancy services. The company supports the business development of R&D organizations, industrial companies, and investors by offering them a deep understanding of their IP environment and technology trends. Knowmade operates in the following industrial sectors: compound semiconductors, power electronics, RF devices and technologies, solid-state lighting and display, photonics, memory, MEMS and sensors, semiconductor manufacturing and advanced packaging, battery and energy management, biotechnology, pharmaceuticals, medical devices, medical imaging, and agri-food. Knowmade’s experts provide prior art search, patent landscape analysis, scientific literature analysis, patent valuation, IP due diligence, and freedom-to-operate analysis. The company also delivers litigation/licensing support, technology scouting, and IP/technology observation. Knowmade’s analysts combine their technical and patent expertise with powerful analytics tools and proprietary methodologies, delivering invaluable patent analyses and scientific reviews.

# ORDER FORM

## Microfluidics

Startup Identification – March 2020

Ref.: KM20003

### SHIP TO

Name (Mr/Ms/Dr/Pr):

Job Title:

Company:

Address:

City:

State:

Postcode/Zip:

Country:

VAT ID Number for EU members:

Tel:

Email:

Date:

### PAYMENT METHODS

Order online: [Click here](#)

#### Check

To pay your invoice using a check, please mail your check to the following address:

KnowMade S.A.R.L.  
2405 route des Dolines, Le Drakkar D  
06560 Valbonne Sophia Antipolis  
FRANCE

#### Money Transfer

To pay your invoice using a bank money wire transfer, please contact your bank to complete the process. Here is the information you will need to submit the payment:

Payee: KnowMade S.A.R.L.  
Bank: Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var  
IBAN: FR76 1460 7003 6360 6214 5695 139  
BIC/SWIFT: CCBPFRPPMAR

#### Paypal

To pay your invoice via PayPal, you must first register at [www.paypal.com](http://www.paypal.com). You can then send money to KnowMade S.A.R.L. by entering our email address ([contact@knowmade.fr](mailto:contact@knowmade.fr)) as the recipient and entering the invoice amount.

#### RETURN ORDER BY:

**Email:** [contact@knowmade.fr](mailto:contact@knowmade.fr)

**Mail:** KnowMade S.A.R.L. 2405 route des Dolines, 06560 Valbonne Sophia Antipolis, FRANCE

### PRODUCT ORDER

**€1,990 – Multi-user license\***

For the price in dollars, please use the current day's exchange rate. French customers, please add 20% for VAT.

Upon payment reception, all reports are delivered electronically in pdf format

*\*The report can be shared with the employees of the Company purchasing the report. Subsidiaries and joint-ventures are excluded. Please be aware that the report is watermarked on each page, with the name of the recipient and the organization (the name mentioned on the PO).*

*I hereby accept Knowmade's Terms and Conditions of Sale*

**Signature:**

# TERMS AND CONDITIONS OF SALES

## Definitions

“Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”.

“Buyer”: Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on the one hand and the Buyer on the other hand.

“Intellectual Property Rights” (“IPR”) means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

“License”: For the reports and databases, 2 different licenses are proposed. The buyer has to choose one license:

1. Single-user license: a single individual at the company can use the report.

2. Multi-user license : The report can be shared with the employees of the company purchasing the report. Subsidiaries & joint-ventures are excluded.

“Products”: Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

“Seller”: Based in Sophia Antipolis (France headquarters), Knowmade is a technology intelligence company specialized in the research and analysis of scientific and technical information. We provide patent landscapes and scientific state of the art with high added value to businesses and research laboratories. Our intelligence digests play a key role to define your innovation and development strategy.

## 1. Scope

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBJECTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.

1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”. This results in acceptance by the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer’s address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

## 2. Mailing of Products

2.1 Products are sent by email to the Buyer:

- within [1] month from the order for Products already released; or

- within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.

2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including in cases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.

2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.

2.4 The mailing is operated through electronic means either by email via the sales department. If the Product’s electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to produce sufficient evidence of such defects.

2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

## 3. Price, invoicing, and payment

3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.

3.2 Payments due by the Buyer shall be sent by cheque payable to Knowmade, PayPal, or by electronic transfer to the following account:

Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var

BIC or SWIFT code: CCBPFRPPMAR

IBAN: : FR76 1460 7003 6360 6214 5695 139

To ensure payment, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.

3.3 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.

3.4 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

## 4. Liabilities

4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement

4.3 In no event shall the Seller be liable for:

a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller's website or the Products, or any information provided on the website, or in the Products;

b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.

4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.

4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non-acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of saleability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

## 5. Force majeure

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

## 6. Protection of the Seller's intellectual property

6.1 All intellectual property rights attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.

6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:

- Information storage and retrieval systems;
- Recordings and re-transmittals over any network (including any local area network);
- use in any timesharing, service bureau, bulletin board or similar arrangement or public display;
- Posting any Product to any other online service (including bulletin boards or the Internet);
- Licensing, leasing, selling, offering for sale or assigning the Product.

6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.

## 7. Termination

7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

## 8. Miscellaneous

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

## 9. Governing law and jurisdiction

9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Grasse, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.