

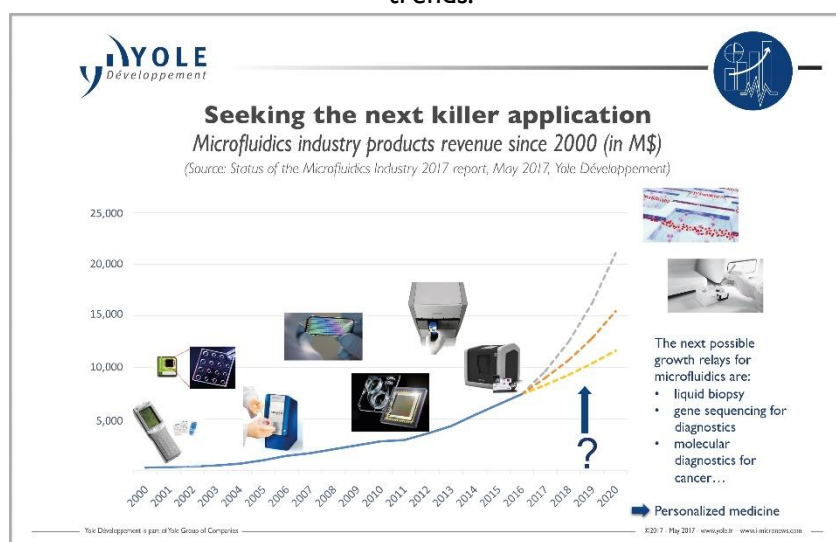


FOR IMMEDIATE RELEASE:

Microfluidics industry: what will trigger the next growth spurt?

Status of the Microfluidics Industry 2017 report | FLUIDIGM Patent Portfolio Analysis | Microfluidic Technologies for Diagnostic Applications Patent Landscape

LYON, France – May 22, 2017: “Microfluidic technologies have been around for a while, but only in the last few years have certain applications started benefiting from microfluidic breakthroughs”, comments **Technology & Market Analyst, Sébastien Clerc from Yole Développement (Yole)**, part of Yole Group of Companies¹. Indeed, microfluidic technologies have finally found sweet spots and there are already credible options for the next upsurge, announces Yole, in its latest report, [Status of the Microfluidics Industry](#). Yole is daily working with [KnowMade](#), a technology intelligence and IP strategy consulting company to understand the technology trends and market evolution. KnowMade, part of Yole Group of Companies as well, is covering lot of industrial domains including the microfluidics industry. This year, the company especially released two dedicated reports: [FLUIDIGM Patent Portfolio Analysis](#) and [Microfluidic Technologies for Diagnostic Applications Patent Landscape](#). What is the status of the microfluidics industry? What are the major technical evolutions and business opportunities? What is the impact on the supply chain?... Yole Group of Companies invites you to immerse yourself in microfluidics world with latest market and technology trends.



Ten years ago, NGS² started to find new possibilities enabled by microfluidics and the cost of sequencing never stopped dropping since then. Next, in 2014/2015, molecular diagnostics for decentralized use began reaping microfluidic technologies' full benefits, especially at the sample preparation level, thus enabling strong penetration

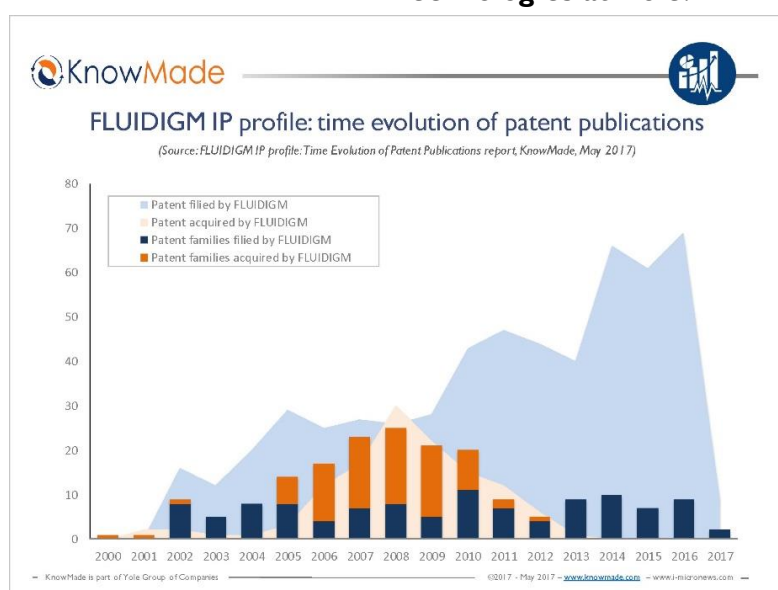
¹ Yole Group of Companies includes Yole Développement, KnowMade, System Plus Consulting, PISEO and Blumorpho.

² NGS : Next-Generation Sequencing

in the field of PoC³ testing. Today, these applications are still driving the microfluidics industry's growth and structure. In its microfluidics report, Yole announces a US\$2.5 billion microfluidic device market in 2017 and forecasts a US\$5.8 billion market by 2022, with 18% CAGR during this period⁴.

From microfluidic devices like manufactured chips, delivery tools, and dispensers, microfluidic-based products are then provided to end-users, offering numerous possibilities.

“The industry's growth is not surprising, given the high demand from end-users for increasingly automated, integrated, miniaturized solutions”, asserts **Dr Benjamin Roussel, Business Unit Manager, Medical Technologies at Yole.**



The microfluidics industry could experience additional growth booms in the next few years. In particular, cancer diagnostics, treatment planning, and follow-up look extremely promising with the increased use of microfluidic technologies at sample preparation level to isolate circulating tumor cells and DNA in liquid biopsies for example and at diagnostics level with molecular diagnostics for oncology for the analysis of these cells and DNA molecules.

Moreover, in accordance with these forecasts, **Brice Sagot, KnowMade's Founder & CEO** confirms: cancers are currently the major diseases targeted by patent applicants in the domain of microfluidic technologies for diagnostic applications⁵. In this domain, nucleic acid amplification is the most widespread diagnostic technique in patents.

Organs-on-chips are another microfluidics application with the potential to become a multi-billion-dollar market, enabling more predictive models for drug and compound testing.

“There is no doubt these emerging applications will drive the market's continuous growth over the next decade, especially with a myriad of startups emerging and proposing innovative microfluidic solutions to solve today's and tomorrow's major issues”, comments **Dr Marjorie Villien, Technology & Market Analyst from Yole.**

³ PoC: Point-of-Care

⁴ Source: [Status of the Microfluidics Industry report](#), Yole Développement, May 2017

⁵ Source: [Microfluidic Technologies for Diagnostic Applications Patent Landscape report](#), KnowMade, January 2017

The emergence of numerous new players has inevitably some consequences on historic microfluidic players, who are facing strengthening competition and sometimes need to adapt their strategy to remain competitive. As an example, Fluidigm is considered as a pioneer in microfluidic technologies, in particular gene sequencing and genomics. In its [Fluidigm: Patent portfolio analysis](#) report, the company KnowMade, also part of Yole Group of Companies, shows that Fluidigm started the development of its patent portfolio in the early 2000s. The number of new patents filed each year by Fluidigm has remained stable since then. However, the company recently faced a strong stop in revenue growth, certainly due to fierce competition. In the meantime, its innovations and claimed inventions have evolved considerably: could it be correlated? KnowMade analyses the interesting and strategic shift made by Fluidigm in order to strengthen its market positioning. Will this shift allow Fluidigm to get back to growth?

Yole and KnowMade collaborate to get a comprehensive understanding of the markets evolution and companies' strategy. Combination of their analyses is showing the relevance of this partnership for their customers.

Microfluidic technologies' maturation and their increased use within the industry has also affected supply chain structure. While some diagnostics companies are outsourcing microfluidic device production, others have made the choice to produce in-house, which raises many questions about the cost of goods sold and where the value stands. Yole's analysts have investigated these critical points and present their conclusions in the report.

All year long, Yole Group of Companies' network can have an access to these results during conferences, trade shows and webcasts. For more information, click: [Events – Microfluidic Webcast](#).

Detailed presentations of the MedTech technology & market analyses are available on i-micronews.com, [MedTech reports section](#).

About [Status of the Microfluidics Industry 2017](#) report

Diagnostics, point-of-care, and pharmaceutical research will drive the rapidly-expanding microfluidic products industry to a potential value of \$23B by 2022. What will trigger the next growth spurt? This report has been performed by Yole Développement (Yole) part of Yole Group of Companies.



Companies cited in the report:

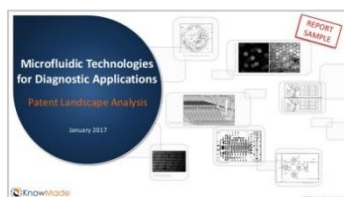
10x Genomics, 3M, Abaxis, Abbott, Advanced Liquid Logic, Affymetrix, AGC, Agilent Technologies, Alere, Alfa Laval, Aline, Alza, Alzet, Angle, Apogee MEMS, Applied Biosystems, ARaymond Life, Arrayjet, A-Star, Ativa, Atlas Genetics, Axxicon, Axxin, Azbil, Baebies, Bartels Mikrotechnik, Bayer, BD, Beckman Coulter, Beijing Genomics Institute, Biocartis, BioFire Diagnostics, BioFluidix, BioMensio, bioMérieux, Bio-Rad, Biotechne, Boehringer Ingelheim, Bronkhorst, Brooks, Burkert, Caliper, Cambridge Consultants, CapitalBio Technology, Capsum, Carbo Analytics, CDA, CellSearch, Celsee, Cepheid, Ceti, CG.TEC, Chemtrix, ChipCare, Corium, Corning, Crospon, Curiox, Cytena, Daktari Diagnostics, Danaher, DARPA, Debiopharm, Debiotech, Denz Biomedical, DiaSorin, Dimatix, DNA Electronics, Dolomite, Draper, Dublin City University, DuPont, Durect, EKF, Eksigent, Elveflow, Emulate, EnablingMNT, Enplas, Epigem, ETH Zürich, Etta Healthcare, Fast-Track Diagnostics, Fluidigm, Fluigent, Focus Diagnostics, Fralock, Fraunhofer, Freescale, Future Chemistry, GE, Gnalyte, Genapsys, GeneFluidics, GenePOC, GenMark Diagnostics, Gilson, Great Basin Scientific, Gyros, Hamilton, Helvoet, HNP Microsystems, Honeywell, HP, IBM Research, IDEX, Illumina, IMT, Imtek, Invenios, Invetech, InZign, Ion Torrent, IQuum, iX-Factory, Johnson & Johnson, Kapplex, Klearia, Kloehn, Kumetrix, Labcyte, LabSmith, LeukoDx, Life Technologies, LionIX, Little Things Factory, Lonza, Luminex, LUT, Malema, Medimate, Medspray, Medtronic, Menarini, Micralyne, microDrop, Microfluidic ChipShop, Microglass Chemtech, microLiquid, Micronics, Micronit, miniFab, Miroculus, MyCartis, Mylife Technologies, Nabsys, NanoBiosciences, Nanocollect, NanoMR, NanoPass, Nanosphere, NASA, Norgren, Nortis, Omron, OndaVia, OPKO Diagnostics, Ovagene, Oxford Nanopore, Pacific Biosciences, Pall Corporation, PerkinElmer, Pfizer, Philips, PlanOptik, POC, Porter, PositivelD, RainDance, RedShift, Rheonix, Roche, Rogers Corporation, Rqmicro, Samsung, Savyon Diagnostics, Schlumberger, Schott, Scienion, Sciex, Screen Holdings, Sensirion, SensoDx, Seyonic, Shimadzu, Siemens, Sigma Aldrich, Silix Microsystems, Silicon Biosystems, Scandinavian Micro Biodevices, Sony DADC, Sphere Fluidics, STMicroelectronics, Stratec, Syntics, Takara, Takasago, TDK, TearLab, Tecan, Tecnisco, Telechem, Teledyne Dalsa, Thalesnano, The Lee Company, Thermo Fisher Scientific, ThinXXS, Translume, Tronics Microsystems, TSMC, TTP Labtech, TTP Group, Two Pore Guys, uFluidix, Valcor, Vaxxas, Vortex Biosciences, WaferGen Biosystems, Waters, Weidmann Plastics, Xaar, YMC, Zephyrus Biosciences, z-microsystems, Zoetis, Zosano, Zurich Instruments... and more

Authors:

Sébastien Clerc is a Medical Technologies Analyst at Yole Développement. After graduating from Grenoble INP with a Biomedical Technologies Master degree, he completed his training with a Master degree in Innovation and Technology Management, during which he oversaw strategy and marketing.

Dr Benjamin Roussel is Business Unit Manager of the MedTech activities at Yole Développement. Supporting industrial companies and R&D institutes in their development, Benjamin and his team are making the bridge between innovative microtechnologies and numerous diagnostics, pharmaceutical, life sciences and medical devices applications. Benjamin Roussel is the author of a large collection of market & technology reports and performs multiple custom consulting projects. He has spoken in more than 20 industry conferences worldwide over the last 5 years. He holds a Pharmacy diploma from the University Claude Bernard Lyon (France), in addition to a master's degree in Technology & Innovation Management from EM Lyon Business School (France).

As a Technology & Market Analyst, **Dr Marjorie Villien** is a member of the MedTech business unit. She is a daily contributor to the development of MedTech activities. After spending 2 years at Harvard, Marjorie served as a research scientist at INSERM in the field of MRI & PET imaging. She has spoken in numerous international conferences and has authored or coauthored 11 papers and 1 patent. Marjorie Villien is graduated from Grenoble INP and holds a PhD in physics & medical imaging.



About [Microfluidic Technologies for Diagnostic Applications Patent Landscape](#)

New comers and emerging applications for oncology and infectious diseases are driving the growth of microfluidics IP

Companies and academics cited in the report:

Abbot, Agilent, Alere, BD, Bio-Techne, Caliper, Caltech, Celectricon, Fluidigm, Fluxion Biosciences, GPB Scientific, Gyros, HandyLab, HP, IDEX, Illumina, MGH, Micronics, MIT, Ningbo University, PerkinElmer, Philips, ProteinSimple, Roche Diagnostics, Samsung Electronics, Siemens, University of California.

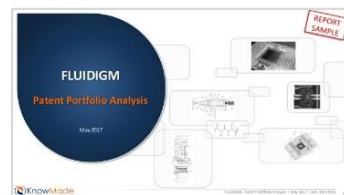
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Dr. Coralie Legreneur works for KnowMade in the field of Biotechnology and Life Sciences. She holds a PhD in Molecular Biology from the University of Nice Sophia-Antipolis, France. She also holds the International Industrial Studies Diploma in Patents from the CEIPI, Strasbourg, France.

Dr. Brice Sagot is COO and co-founder of KnowMade. He is leading the Biotechnology and Life Sciences department. He holds a PhD in molecular biology from the University of Nice Sophia-Antipolis, France.

About [FLUIDIGM Patent Portfolio Analysis](#)

Fluidigm is taking a leading IP position in emerging microfluidic technologies This report has been performed by KnowMade, part of Yole Group of Companies.



Authors:

Dr. Nicolas Baron is CEO and co-founder of KnowMade. He is leading the Microelectronics and Nanotechnology scientific and patent analysis department. He holds a PhD in Physics from the University of Nice Sophia-Antipolis, plus a University Diploma in Intellectual Property Strategy and Innovation from the European Institute for Enterprise and Intellectual Property

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Dr. Brice Sagot is COO and co-founder of KnowMade. He is leading the Biotechnology and Life Sciences department. He holds a PhD in molecular biology from the University of Nice Sophia-Antipolis, France.

About KnowMade – www.knowmade.com



Specializing in analysis of patents and scientific information, KnowMade provides Technology Intelligence and IP strategy consulting services. The company supports R&D organizations, industrial companies and investors in their business development by offering them a deep understanding of the technology trends and their IP environment. KnowMade operates in the following industrial sectors: Microelectronics, Compound Semiconductors, Power Electronics, RF & Microwave Devices, MEMS Sensors & Actuators, LED/OLED, Imaging & Display, Photonics, Battery, Manufacturing & Advanced Packaging, Micro & Nanotechnology, Biotechnology, Cellular & Molecular Biology, Microbiology, Dermatology, Pharmacology, Oncology, Immunology, Medical Devices, Medical Imaging, Agri-Food & Environment.

KnowMade performs prior art searches, patent landscape analysis, scientific literature analysis, patent valuation and freedom-to-operate analysis. In parallel, the company offers litigation/licensing support, technology scouting and an IP watch service.

KnowMade's analysts combine their technical and patent expertise by using powerful analytics tools and proprietary methodologies to deliver relevant patent analyses and scientific reviews.

About Yole Développement – www.yole.fr

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, RF Electronics, LED,



Displays, Image Sensors, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

The “More than Moore” company Yole, along with its partners System Plus Consulting, PISEO, Blumorpho and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets

and follow technology trends to grow their business.

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