

# POINT-OF-NEED 2020 - INCLUDING PCR-BASED TESTING

## Market & Technology Report - April 2020

*Covid-19 is shaking up the diagnostics industry and will have both short- and long-term impact.*

### WHAT'S NEW

- In addition to the usual segmentation by application/ settings, this year we introduce the expected segmentation and market data/forecasts per type of test, spanning immunoassay, molecular diagnostics, clinical chemistry and more
- Detailed data for over 50 players, presented through charts: Installed base of instruments, instruments placed per year, tests per instrument per year, test ASP per type of test, consumable pullthrough per instrument
- More depth on market shares, per segment, and detailed list of players per segment
- Examples of success stories and failures, companies to watch in the coming years, and key considerations for commercial success
- New detailed sub-segmentation for the veterinary market and for the emergency testing market

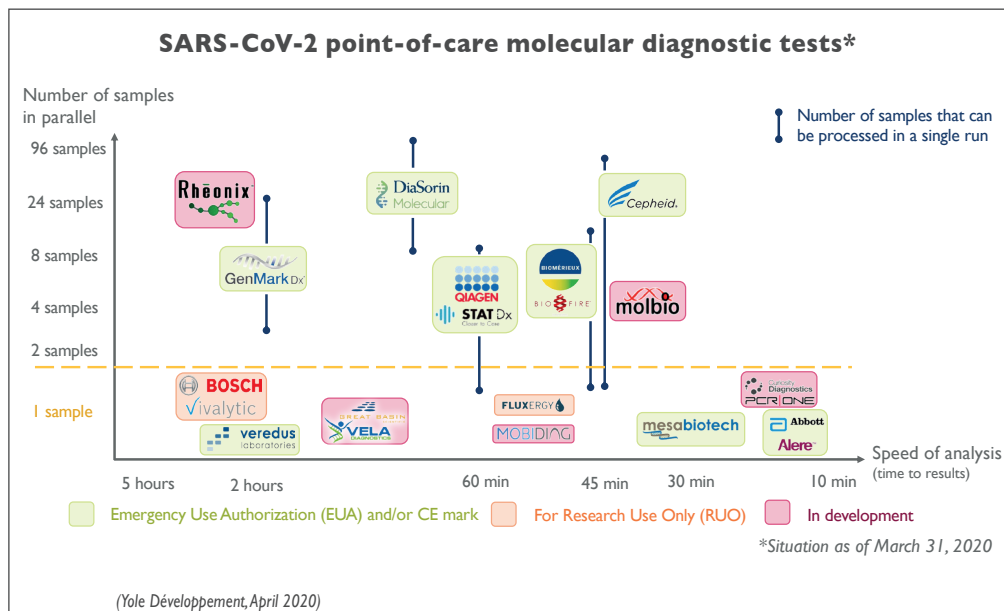
### KEY FEATURES

- Overview of what microfluidic technology offers to point-of-need (PoN) testing
- New major trends and evolution at the market level and at the technology level including a focus on the high-plex molecular diagnostics space, and a focus on multi-modal platforms
- Updated market data and forecast 2018-2025, in value and units for microfluidic devices and tests, per segment and per type of test
- Supply chain description and analysis
- Market segmentation with technical and economical requirements per segment, product examples, key players, market share, and market and technology trends

### THE COVID-19 PANDEMIC HIGHLIGHTS THE IMPORTANCE OF RAPID, ACTIONABLE POINT-OF-CARE DIAGNOSTICS

The past few months have seen a new biological threat, the COVID-19 infection, also called new coronavirus, and caused by the SARS-CoV-2 virus, which has reshaped the entire diagnostics ecosystem. As the epidemic has slowed down in China, it is Europe's and the USA's turn to be suffering. As a direct consequence, there is a strong demand for diagnostics tests to rapidly identify infected people and numerous companies started developing such tests, including companies relying on microfluidic technologies. In a few weeks, tens of tests were ready. However, everything that has to deal with human health has to face very slow regulatory processes. In front of the sanitary emergency, the FDA and other regulatory bodies finally lowered their standards, granting "Emergency Use Authorizations" for some of these tests. Since mid-march, companies like Cepheid, GenMark, BioFire/bioMérieux, and Mesa Biotech got approval for microfluidic-based rapid molecular testing for SARS-CoV-2. Even more companies have released such tests

for Research Use Only (RUO), waiting for approval. The mid-term goal for some of these companies will be to add SARS-CoV-2 to their syndromic respiratory panels. There is a race towards diminution of the time to result, from days to hours to minutes, but also towards increasing the throughput. Abbott announced a 13-minute test at the end of March, but its IDNOW platform deals with only one sample at the time. Other platforms take longer to deliver results but some of them can process multiple samples per run. The opportunity looks huge for diagnostics companies, but is the supply chain ready for mass-production of these tests in addition to their usual business or will it impact the production of other types of tests? The pandemic poses interesting questions regarding the length of development, approval and manufacturing of tests when we have no time to waste but that reliability cannot be compromised. It will be interesting to see how these issues will be addressed once the pandemic will be behind us.



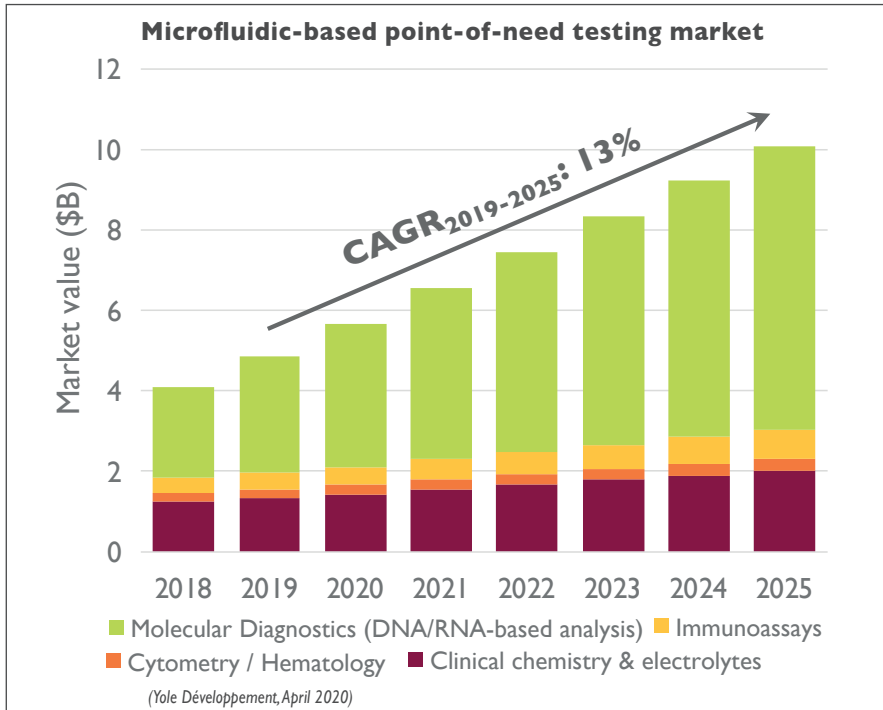
### DIFFERENT MARKET SEGMENTS ENJOY DIFFERENT DYNAMICS, BUT OVERALL MOLECULAR TESTING IS BOOMING LIKE NEVER BEFORE

The COVID-19 pandemic highlights the need for rapid and actionable results at the point-of-care, which is true for various, increasingly complex and comprehensive test panels. To achieve that, molecular diagnostics are key. This category of test is now making it to the next step, thanks to

ever more complex integration and automation on-chip. For the first time in this report, Yole Développement (Yole) proposes market data and forecasts for 2018-2025 per type of test spanning clinical chemistry, immunoassays, molecular diagnostics, cytometry, and more.

Molecular diagnostic tests represented more than half of the market value in 2019 and will represent about 70% by 2025. The overall microfluidic-based point-of-need testing market will grow at a compound annual growth rate (CAGR) from 2019-2025 of 13%, from \$4.1B in 2019 to \$10.1B in 2025, driven by human diagnostics segments. In

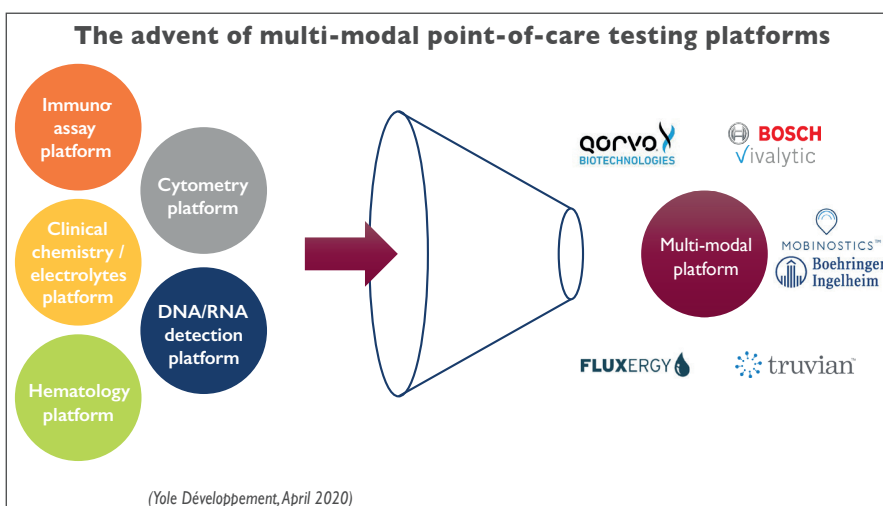
the report, market data and forecasts are also split per market segment, spanning emergency testing, remote area testing, doctor’s office and pharmacies, veterinary, agro-food, industrial, and more. Though most non-human testing areas are lagging behind, veterinary testing sees plenty of tests now reaching commercialization. New opportunities are emerging in industrial testing, for the quality control of pharmaceutical products. For each segment, market and technology trends are described in the report, along with main players, products and market shares. Companies are racing towards ever-higher-plex panels, meaning they want to enable detection of ever more pathogens in a single test. They also aim to reduce time-to-result below 20 minutes to enable use of their technologies at the point-of-care, for example during classic medical appointments. Both are difficult to achieve at the same time, therefore companies have to make some choices. However, some companies are on track to deliver the promise of high-plex, rapid molecular diagnostics at the point-of-care in the coming years and are introduced in the report. In addition, for the first time Yole provides detailed data on about 50 point-of-need companies, presented through charts. The data includes the installed base of instruments, number of instruments placed per year, and number of tests per instrument per year. It also provides average selling price (ASP) per type of test, and consumable pullthrough per instrument.



### THE ADVENT OF MULTI-MODAL PLATFORMS COULD INDUCE PROFOUND CHANGES IN MEDICAL PRACTICE, BUT ARE TECHNOLOGY DEVELOPERS READY TO OVERCOME THIS CHALLENGE?

The holy grail of diagnostics would be a small box able to perform any kind of test in minutes. Platforms that combine clinical chemistry and immunoassays have existed for a long time, but now some companies are addressing a much bigger challenge: combining clinical chemistry, immunoassays, cytometry and molecular diagnostics with the same instrument, at the point-of-care. By doing so, in theory a diagnostics facility could purchase only one instrument and run hundreds of different

tests on that platform instead of having to purchase many different instruments, which is costly and requires lab space, and train personnel to use all these instruments. The difficulty is to be able to integrate all these different detection methods in a single, low-footprint and affordable instrument, while being able to design a cost-effective microfluidic cartridge able to run various types of tests on the same footprint. It is difficult to say who will succeed in that area, but first-comers include companies like Bosch Healthcare with the Vivalytic platform, Qorvo Biotechnologies, Fluxergy and Truvian Sciences. Such multi-modal platforms are extremely promising but require a much heavier R&D effort than usual point-of-care platforms, which are already difficult to bring to the market and to scale-up in a cost effective manner. More than ever, this poses the question of companies’ manufacturing strategy: is it better to manufacture chips and instruments in-house or to outsource to an experienced microfluidic device contract manufacturer? What are the advantages and the associated risks for both options? Which players have adopted which strategy for which products? In the report, Yole’s analysts provide in-depth insights on this topic.



**COMPANIES CITED IN THE REPORT (non exhaustive list)**

Abaxis (Zoetis), Abbott, Abionic, Accelix (LeukoDx), Accriva Diagnostics (Instrumentation Laboratory, Werfen), Achira Labs, AgPlus Diagnostics, Akonni Biosystems, Alere (Abbott, Quidel, Siemens), ALine, ANDE, Aprimeo Diagnostics (R-Biopharm), Applied Microarrays, Ativa Medical, Atonomics, Avalun, Axxicon, Balda AG (Stevanato Group), BD (Becton Dickinson), binx health (formerly Atlas Genetics), Biocartis, Biodetection Instruments, BioFire Diagnostics (bioMérieux), BioMensio, bioMérieux, BioSensia, Biosurfit, Blusense Diagnostics, Boehringer Ingelheim Mobinostics, Bosch Healthcare, Caliper Life Sciences (PerkinElmer), Carbo Analytics, Cepheid (Danaher), Charles River Laboratories, Click Diagnostics, Coris Bioconcept, Cubed Laboratories (formerly FCubed), Cue Health, Curetis, Curiosity Diagnostics (Scope Fluidics), Daktari Diagnostics, Denz BIO-Medical, DiaSorin Molecular, DNAe (DNA Electronics), DxNA, Enigma Diagnostics, ENPLAS, Etta Healthcare (Ovogene Oncology), ExcitePCR (PositiveID Corporation), Flow Alliance, Fluid-Screen, FluimediX, Fluxergy, Focus Diagnostics (DiaSorin Molecular), Genalyte, GeneFluidics, GenePOC (Meridian Bioscience), GenMark Diagnostics, GenSpeed Biotech, Great Basin Scientific (Vela Diagnostics), Hahn-Schickard, Helvoet, HemoCue (Radiometer, Danaher), IDEX Health&Science, IQuum (Roche), iLine Microsystems, imec, Inflammatrix, InSilixa, Instant Labs (Luminultra), IntegenX (Thermo Fisher Scientific), Klearia, LacriScience, LeukoDx, LexaGene, Luminex Corporation, LumiraDx, Maccura, MBio Diagnostics, Medimate (CE-Mate), MeMed, Menarini, Meridian Bioscience, Mesa Biotech, Microfluidic ChipShop, MicroLiquid, Micronics (Sony), Micronit, Minicare (Siemens), MiniFAB (Schott), Mobidiag, and more.

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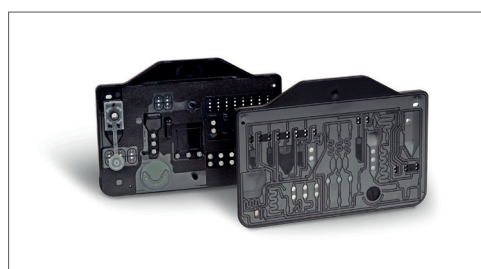
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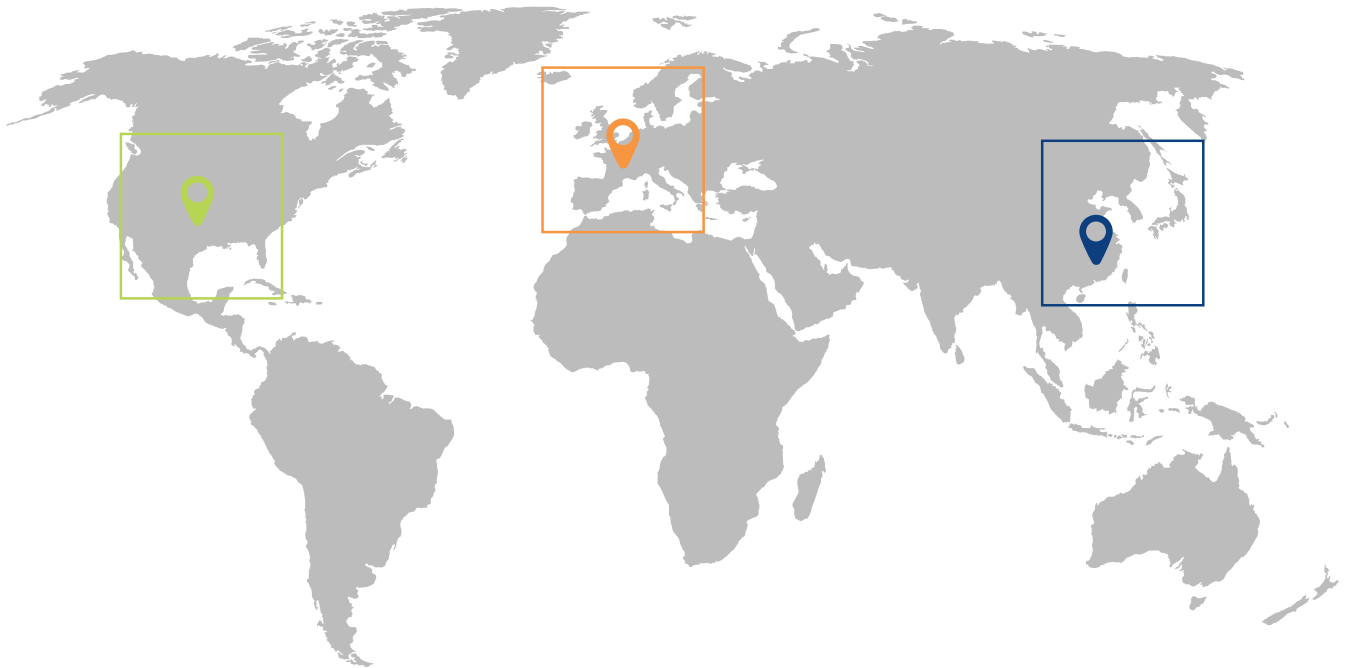
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## ABOUT YOLE DEVELOPPEMENT

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 120 collaborators worldwide covering MEMS and Image Sensors, Compound Semiconductors, RF Electronics, Solid-state Lighting, Displays, Software, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Power Electronics, Batteries & Energy Management and Memory.

The “More than Moore” market research, technology and strategy consulting company Yole Développement, along with its partners System Plus Consulting, PISEO and Blumorpho, supports 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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- Market data & research, marketing analysis
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- Design and characterization of innovative optical systems
- Financial services (due diligence, M&A)

More information on [www.yole.fr](http://www.yole.fr)

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- 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 The Seller shall by no means be responsible for any delay pursuant to Article 2.1 above, in particular in cases where a new event or access to new contradictory information would require the Seller analyst to dedicate extra time to compute or compare the data in order to enable the Seller to deliver a high quality Product.

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HSBC, 1 place de la Bourse 69002 Lyon France  
Bank code: 30056  
Branch code: 00170  
Account n°: 0170 200 1565 87  
BIC or SWIFT code: CCFRFRPP  
IBAN: FR76 3005 6001 7001 7020 0156 587

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- b) Any claim attributable to errors, omissions or other inaccuracies in a Product or interpretations thereof.

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#### 6. PROTECTION OF THE SELLER’S IPR

6.1 All the IPR 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 a Product, or any part of it to any other party other than employees of the Buyer Company (and only in the country of the Primary User for Multi-User Licenses). The Buyer shall have the right to use Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use any 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 a Product or any derivative thereof.

6.3 If the Buyer would like to use data coming from a Product for presentations, press announcements and any other projects, the Buyer needs to contact Yole Développement’s Public Relations Director (info@yole.fr) to get an official authorization and confirm that the data are up to date. In return the Seller will make sure to provide up-to-date data under a suitable public format.

6.4 The Buyer shall be solely responsible towards the Seller for any infringement of the obligation described in Article 6.3 above, whether such infringement originates from the Buyer’s employees or any person to whom the Buyer has sent the Products. Furthermore, the Buyer shall initiate and personally take care of any related proceedings in coordination with the Seller, and the Buyer shall bear the related financial consequences in their entirety.

6.5 The Buyer shall define within its Company an identified user who shall serve as a contact person for the License purchased by the Buyer. This person will be the recipient of each new report. This person shall also be responsible on behalf of the Buyer, for compliance with all copyrights and other obligations relating to the protection of the Seller’s IP rights and general compliance with the terms of the License purchased by the Company. In the context of Bundle and Annual Subscriptions, the contact person shall decide within the Buyer which person(s) shall be entitled to receive the protected link that will allow the Buyer to access the Products.

6.6 It is acknowledged and accepted by the Buyer that whether purchased in the form of Bundles or Annual Subscription, all unselected reports will be deemed cancelled and lost after a period of 12 month following acceptance of the corresponding order by the Seller in accordance with provisions of Article 1.3 above .

6.7 It is further acknowledged and agreed by the Buyer that any investor in the Buyer Company, any external consultant of the Buyer Company or any joint venture done with a third party in which the Buyer Company is involved , is not entitled to use a Product, without paying to the Seller the full price for a license to the required Product..

#### 7. TERMINATION

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 incurred by the Seller, pursuant to such cancellation or postponement.

#### 8. MISCELLANEOUS

8.1 All the provisions of these General Terms and Conditions of Sale are for the benefit of the Seller, but also for that of its licensors, resellers and agents. Each of them is entitled to assert and enforce these provisions against the Buyer.

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

8.2 The Seller may, from time to time, update these General Terms and Conditions of Sale, and the Buyer, shall be deemed to have accepted the latest version of such General Terms and Conditions of Sale, once they have been duly communicated to the Buyer by the Seller.

#### 9. GOVERNING LAW AND JURISDICTION

9.1 Any dispute arising out or linked to these General Terms and Conditions of Sale or to any Licenses or Products purchased in application thereof shall be submitted to the French Commercial Court of Lyon, which shall have exclusive jurisdiction upon such issues.

9.2 French law (without reference to any applicable conflict of law provisions) shall apply to these General Terms and Conditions of sale and any agreement between the Buyer and the Seller made pursuant thereto.