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**A Report
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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
KOL	Key Opinion Leader
CATI	Computer Assisted Telephonic Interviewing
CAWI	Computer Assisted Web Interviewing
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
RNA	Ribonucleic acid
PCR	Polymerase Chain Reaction
RT-PCR	Reverse Transcription-Polymerase Chain Reaction
RT-qPCR	Reverse Transcription-quantitative Polymerase Chain Reaction
NGS	Next Generation Sequencing
MACS	Magnetic Activated Cell Sorting
IVD	In Vitro Diagnostics
CAGR	Compounded Annual Growth Rate
CDMO	Contract Development and Manufacturing Organization
CRO	Contract Research Organizations
R&D	Research and Development

PART - 1

OBSERVATIONAL LEARNING

Organization Introduction

Avoraus Consultancy Services Pvt Ltd is one of the fastest growing market research organization globally. It is an exclusive Healthcare and Life Sciences Market Research agency. It conducts global surveys of the medical market. Avoraus Consultancy Services Pvt Ltd aspires to become one of the largest and most preferred market research and data collection partner globally by acting as an extended arm of a company/organization/firm and providing them with deep and effective insights and information.

In addition to data collection, Avoraus also provide the following services:

- Questionnaire Proofing: a vital step in preparing a survey is to thoroughly proof the final survey before it is sent to the respondents to ensure that the resources and time invested into the survey does not go to waste.
- Questionnaire Translation: it is an essential component of a high-quality survey that refers to the process of translating survey instruments (or questionnaires) into all local languages spoken in the study area.
- Sample Planning: it refers to a detailed outline of measurements of which research is conducted such as the category of population to be surveyed, the sample size, the basis of respondents to be chosen out of the population.
- Survey Programming and Hosting
- Reporting and Analysis

Mode of Data Collection

Avoraus being a market research firm follows a hybrid approach called as 'Avoraus-Hybrid' to get effective and deeper insights. This enables them to reach 'hard to target' audience. It is an amalgamation of the following methodologies:

- Telephonic Survey
- Online Survey
- Video Survey
- Face to Face Survey

As the web revolution has been crucial to the field of market research in the sense of increased number of options as compared to previous research methodologies, Avoraus keeping up with the trend majorly incorporates technologies such as CATI and CAWI to collect the insights and information from the respondents.

CATI

- It is a resourceful way of gathering information or data while performing quantitative market research.
- Interview is conducted over the telephone and the interviewer asks respondents the questions from a pre-designed questionnaire projected over a computer screen.
- The answers are recorded by questioner via a keyboard and mouse to tally with the pre-coded responses shown on the screen.
- Any complex survey logic or questionnaire routing is controlled by the CATI program.

Advantages:

- efficient,
- relatively low costs and errors as the data is recorded directly into the survey database in the well-defined format which eradicates the need for further processing such as transcription, data entry and coding,
- the availability of an enormous pool of quality controlling tools,
- opportunities to cross-examine hard-to-reach classes of respondents.
- in this type of interview, the conversations are taped with the permission of the respondent, so that the recordings can be reviewed at the later stages for reference.

Limitations:

- It is a bit difficult to manage vague answers. The interviewers must be able to type quickly and accurately in order to capture them, even though systems can decently handle open-ended answers.
- If a participant changes an earlier answer in the middle of an interview, it is fairly problematic to trace back to make changes as compared to manual questionnaires.

CAWI

- An online method of taking surveys where the interviewee follows a pre-written script on a website.
- The questionnaire is coded into a program which customizes the flow of the questionnaire based on the responses, adding to the data already known about the interviewee.
- The respondents receive a link via email using this method. They simply click on the link to complete the questionnaire on their own. It can be administered through a web browser or mobile application.

Advantages:

- Since there are practically no expenses linked with procuring printing materials, this method is comparatively cheap to execute,
- Real time processing and data follow-up.

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- The time required for analysis is comparatively reduced as the data is stored into the main database.
- No geographical constraints.
- Skews caused by the interviewer and input errors are suppressed.
- There is no time constraint for the respondents to fill the questionnaire.

Limitations:

- Response rate is limited due to inability of a large number of people to access the internet.
- A lot of people avoid filling online surveys due to their lengthiness and non-relevancy. It is suggested to have shorter questionnaires to encourage higher completion rate.
- Some studies indicate that younger folks make up the majority of those who respond to online questionnaire invitations, hence the senior citizens are poorly represented.
- Absence of an interviewer as a guide for the respondents to walk them through the survey can somehow be a reason to jeopardize the quality of the survey for research.

Avoraus Market Research performs in various domains/departments such as:

KOL Research & Profile

- KOL Identification: done either by conducting survey or by identifying relevant persons in Articles, Magazines, Newspapers, Journals, Conferences, etc.
- KOL Profiling: once the KOL is identified, rigorous desk based research is conducted.

Supply Network

- Avoraus helps companies in understanding the market better by connecting them with various retailers and distributors to identify the expenses involved at each step, as well as helps them in establishing Supply Chain Network.
- Provides the company with a end to end sales picture.

Payers

- Avoraus conducts study and research on payers.
- Helps the clients in Product Portfolio Assessment, Product Development, Brand Assessment and Market Opportunity.

Disease Data & Insights

- Avoraus maintains databases of major diseases globally which consists of number of patients for a particular disease in any country and more specific data such as region wise data.
- The data is updated bi-monthly.

PART - 2

PROJECT REPORT

Project Title

Sampling of Potential Respondents for Global Magnetic Beads Market Research

Rationale

As the world is vigorously combatting against the current SARS-CoV-2 pandemic, the collection and testing of patient samples are mainly being carried using standard diagnostic technique which is primarily based on pharyngeal swabs from which the viral RNA is extracted, causing clinics and laboratories to struggle to keep up with the increased demand for testing. Hence quick and large-scale testing is crucial for limiting the COVID-19 outbreak. The extraction of RNA is the initial stage in Coronavirus detection that needs to be efficient, then only can RT-PCR be conducted to amplify the RNA and identify the virus. Magnetic beads that are specifically functionalized to bind RNA, usually sold in the form of kits, can be used to extract RNA. As the scientists are exploring alternatives to boost Coronavirus testing as well as substitute vaccines having the potential to maximize protection with reduced side effects as compared to existing vaccines, RNA purification on a large scale is very important which can be achieved by bio magnetic separation. Improved medical care at lower costs is the need of hour. Improved testing sensitivity can result in better diagnosis leading to better clinical management and hence reduced cost of clinical care. Magnetic bead-based diagnostics represents an opportunity to improve test sensitivity and test throughput and therefore improved diagnostic care.

Objective

To gain the insights about:

- The estimated market potential of Magnetic Bead-based Molecular and Immunodiagnosics analytical techniques/tests.
- The future growth rate for the next 5 years of the market.
- Identifying the leading market players in the market.
- Understanding impact of COVID-19 on the market for Magnetic Bead- based Molecular and Immunodiagnosics analytical techniques/test.

Literature Review

Introduction

The causative agent of COVID-19 is SARS-CoV-2, which was initially detected in Wuhan, a city in China. It was first pinpointed in December 2019 and began proliferating all around the world, giving birth to a pandemic. In a haste, many countries conducted large-scale diagnostics to restrain this deadly entity, which also led to the strict enforcement of public health measures. The ongoing pandemic focuses on the necessity of much needed vigilance and response. As there are still some concerns over the sufficient availability of vaccines in the country, hindering the vaccination drive, prior detection and isolation of the patients that are being tested positive still proves to be the most impactful measure to prevent this anthroponotic disease outbreak. The detection of SARS-CoV-2 and its diagnosis is done on the basis of viral RNA extraction from a pharyngeal swab which is currently the standard test, following extremely sensitive RT-qPCR. Prior to detection, RNA isolation is an essential action which guarantees the specificity and sensitivity of detection methods. To that goal, reliable and high-throughput nucleic acid isolation methods must be available along with a large manufacturing and distribution capacity. However, most of the RNA purification kits that are currently available in the markets are pricey and frequently depend upon several elements that are difficult to replace, which leads to uncertainty in their supply. In addition to this, they do not provide buffer compositions. This is the main reason why commercial kits are unable to provide much needed flexibility and availability when it comes to a huge disease outbreak.

Here, Magnetic Beads-based RNA extraction turns out to be advantageous because it is mostly independent of producers, and doesn't count upon uncommon components that are hard to substitution, and can be scaled-out for mass testing. Furthermore, magnetic beads can be made in a laboratory using chemicals that are commonly available and basic equipment. Overall, the Magnetic Beads-based RNA extraction demonstrates a charter for diagnostic preparation in the case of bulk testing, because of its economical, high-throughput compatibility, and liberation from complex laboratory equipment like automated RNA extraction kits and RT-qPCR machines.

What are Magnetic Beads?

Also known as superparamagnetic particles, magnetic beads are one of the most multifaceted tools for undemanding and effective seclusion of biomolecules in molecular biology. They are made up of minute particles of iron oxides such as magnetite (Fe_3O_4), ranged between 20-30 nanometers in size, which give them superparamagnetic properties. These superparamagnetic beads display their behavior of magnetism only when they are in an external magnetic field making them different from other more common ferromagnets. They can be utilized without any fear of unwanted clumping because they don't magnetize outside of a magnetic field.

Types of Magnetic Beads

The types of magnetic beads are classified on the basis of various surface coatings and chemistries. These chemistries and coatings on the surface provide its own binding properties to each magnetic bead, which makes them suitable for immunodiagnostic and molecular applications.

Magnetic particles are functionalized with various compounds to allow for the attachment of receptors and ligands on their surfaces as well as the binding of biomolecules like nucleic acids, proteins, monoclonal antibodies, peptides and streptavidin to guarantee specific interactions with target molecules.

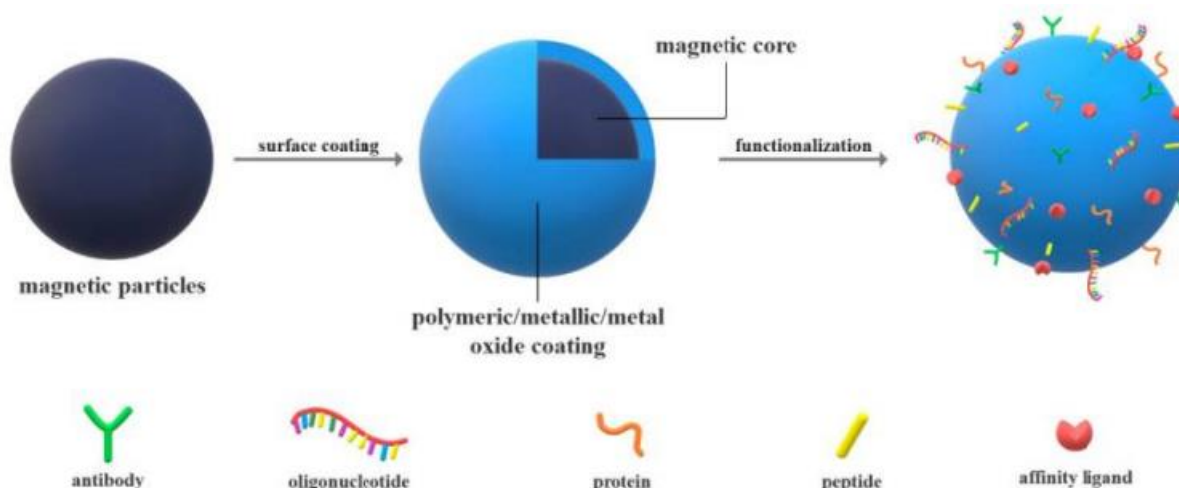


Fig. 1 The procedure of synthesizing magnetic beads for molecular diagnosis. Source: PubMed Central¹¹

Application of Magnetic Beads

The figure mentioned below depicts the broad classification of biomedical applications of magnetic beads.

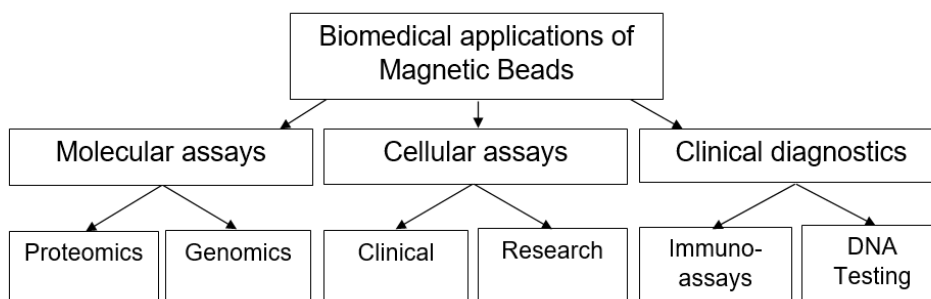


Fig. 2 Classification of Biomedical Applications of Magnetic Beads. Source: www.cardiogenics.com/market_advantages/CGNHMagneticBeads⁵

The ease-of-use of magnetic beads due to their versatility and surface properties make them responsive to automation as well as well-suited for a variety of applications such as:

- Magnetic activated cell sorting (MACS)

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- Protein isolation and purification
- Sample preparation for NGS and PCR,
- Cell labelling
- Bioimaging systems
- Hyperthermia for cancer therapy
- Molecular and immunodiagnostics
- Blood screening
- Drug targeting

Advantages of Magnetic Beads

- Magnetic beads manufacturing doesn't produce any byproducts which can be unsafe for the environment or for human health.
- They can also be utilized repeatedly for multiple analyses because nearly all biological materials are unsuceptible to magnetic fields and the magnetic beads can be effortlessly segregated from the reaction mixture and re-dispersed after the magnetic field is removed, which makes them highly superior in terms of time and cost savings, including high-throughput, energy efficiency, improved sensitivity, specificity, and stability.

As a result, magnetic particles provide a safe and adaptable platform for otherwise time-consuming bioassays.

Role of Magnetic Beads in Molecular Diagnostics

- Molecular Diagnostics (a segment of IVD) is a field that combines laboratory medicine with molecular genetics to produce analytical tools based on nucleic acid for biological gene expression evaluations and biological markers. Isolation, amplification, detection, and discrimination procedures for DNA and/or RNA are all used in nucleic acid testing.
- Preparation of sample and targeted analyte isolation, purification, and extraction are two main applications of magnetic beads in molecular diagnostics.

How Does Magnetic Beads Work?

Owing to the inclusion of various components in biological samples making them highly complex, it is crucial that prior to the analysis, the specific target entity must be separated from the raw sample. Conventional methods for separating target biomolecules based on fluid-phase techniques, such as centrifugation and filtration, are time-consuming and inefficient, and they frequently result in biological material degradation.

A substitute technique to overcome these drawbacks can be the application of magnetic separation, that includes the Magnetophoretic phenomena where the magnetic entities migrate relative to their non-magnetic surrounding environment under a heterogeneous magnetic field. The target entities are magnetically segregated from the

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sample by providing an external magnetic field that creates a magnetic field gradient, either by intrinsic magnetic properties or by labelling with magnetic materials.

In the case of magnetic separation,

1. The sample is loaded with functionalized superparamagnetic particles.
2. It is incubated for specified period, in order for the target analytes to interact with the sample.
3. After that, the particles are separated from the sample by using a magnet on the vessel's outside wall.
4. The excess liquid is discarded.
5. The analytes that occur are eluted from the particles and analyzed further.

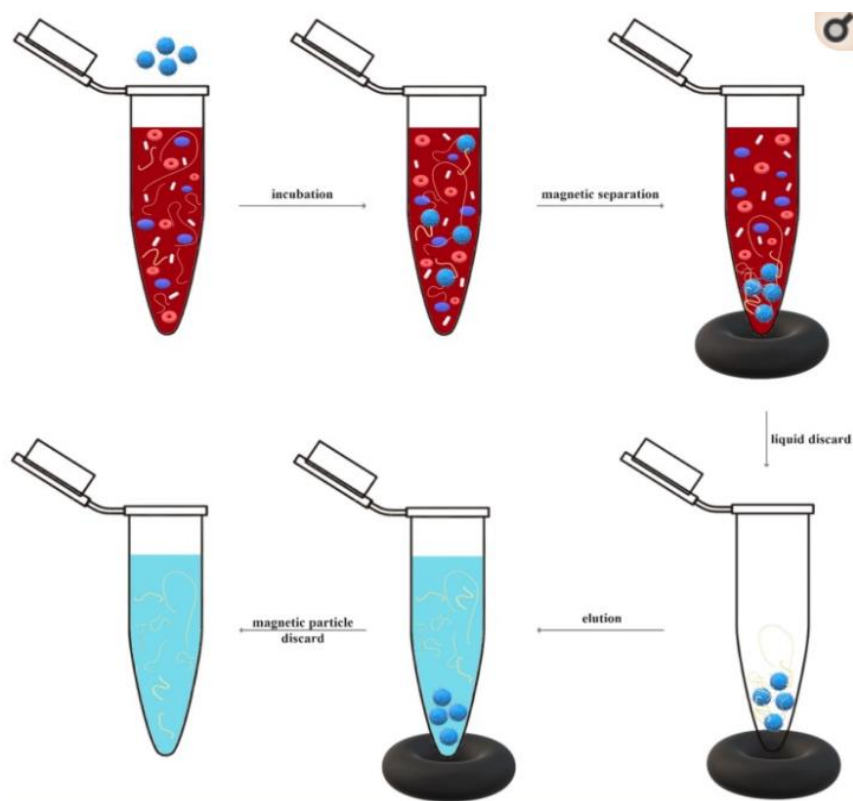


Fig. 3 A diagrammatic representation of Steps for magnetic separation.

Source: PubMed Central¹¹

Industrial Overview

Global Market Overview for Magnetic Beads

As the outbreak of COVID-19 continued to spread, the demand for molecular testing, particularly those involving RT-PCR, which is considered as the gold standard for diagnosing infectious disease, increased manifolds for much quicker testing and in greater volumes. Initially, the demand was almost unachievable for RT-PCR testing resulting in longer turnaround time of laboratories and shortage of reagents.

If we look at the global market, in the United States and Europe alone, the demand for molecular-diagnostic rose by 20 times from March to October 2020.

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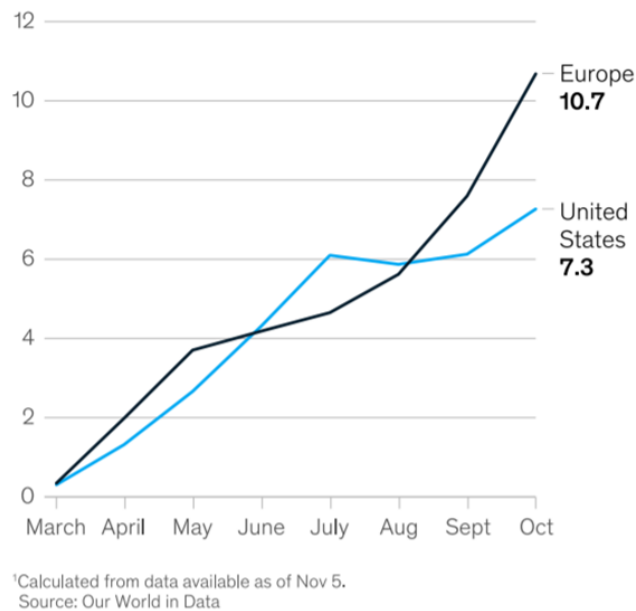


Fig 4. Molecular Assays performed per week in Europe and the US (millions). Source: McKinsey & Company¹³

In response to the mayhem, there has been an enhancement in the testing volume, development of new diagnostic technologies and healthcare infrastructure.

Over the projection period of 2020 to 2027, rising investments in microbiological and genetic research are likely to enhance the demand of magnetic beads significantly.

The global market for magnetic beads was valued at a whopping USD1.1 billion in 2019 and \$1.5 billion in 2020, and is forecasted to attain >\$4.4 billion by 2027, growing at a CAGR of 13.3% from 2021 to 2027.

The global market for magnetic beads categorized by:

- Magnetic core
- Size
- Application and
- Region

Based on magnetic core, the categorization of global market is:

- Ferrimagnetic and
- Superparamagnetic

In 2019, the largest share was acquired by ferrimagnetic segment, and it is expected to attain a massive \$2.6 billion by 2027, with a likelihood to grow at 12.1% CAGR. On the other hand, the superparamagnetic segment is expected to grow at 12.6% CAGR.

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According to the size, the global market is categorized as follows:

- Less than 5 μm
- 5-20 μm
- 20-40 μm
- 40 μm and higher

The first mentioned category dominated share wise in 2019 and is projected to touch \$1.3 billion by 2027, while the 5-20 μm sized category is predicted to grow at 11.9% CAGR year on year for the forecast period.

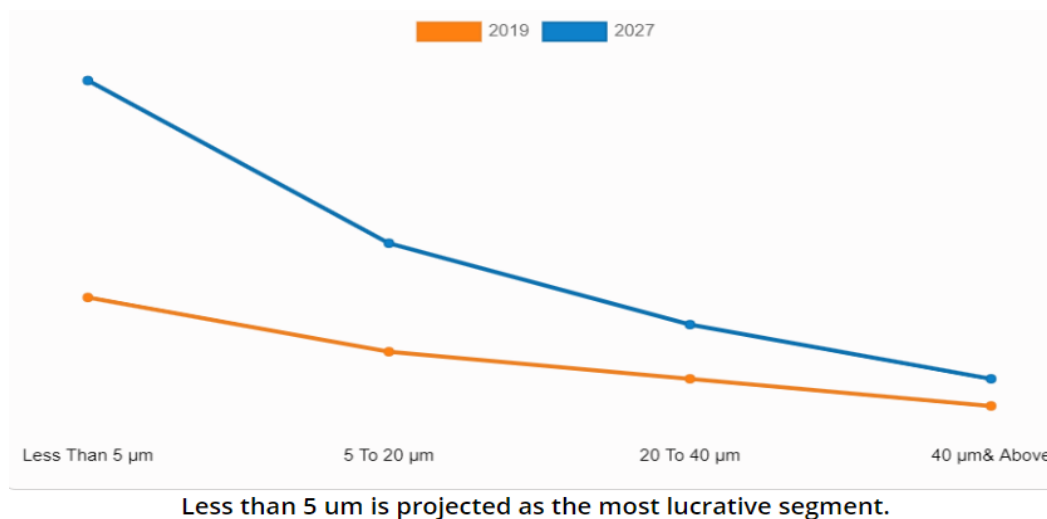


Fig 5. Global Magnetic Beads Market Growth Trend by size. Source: Allied Market Research⁹

Based on application, the global market is categorized into:

- Molecular & Immunodiagnostics,
- Biomolecules Separation & Purification,
- NGS, and
- Others.

The Biomolecules Separation & Purification market dominated the global magnetic beads market in 2019 in regards to generation of revenue and would continue to be a dominant market till 2027. This segment is expected to increase at a CAGR of 11.3% between 2020 and 2027.

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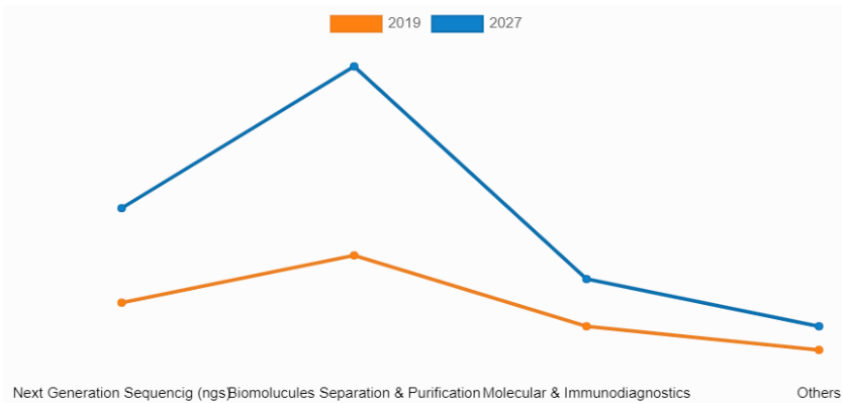


Fig 6. Global Magnetic Beads Market Growth Trend by application. Source: Allied Market Research⁹

According to geography, the market of magnetic beads in Asia-Pacific is predicted to escalate at a CAGR of 13.6% during 2020 to 2027, occupying 37.8% of the total magnetic beads market. North America came out as the leader of magnetic beads market in 2019 and it is estimated to achieve \$1.1 billion by 2027. In 2020, the APAC market for magnetic beads accounted for more than \$ 340 million.

Based on End-user, the market is segmented into:

- Healthcare facilities
- Individual pathology labs
- Research labs
- Others

The research labs category is expected to grab the maximum market share of 37.5% in 2020.

Some of the key players in the global magnetic beads markets includes:

- Thermo Fisher Scientific (Dyna)
- Promega
- Takara (Clontech)
- Bio-Rad Laboratories India Pvt. Ltd.
- Teja Scientific Glass Works
- Bang Laboratories
- CardioGenics
- Alcon Scientific Industries
- Merck Millipore
- Qiagen

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How COVID-19 impacted the global magnetic beads market:

There was a positive effect on the market due to COVID-19 outbreak. The detection of SARS-CoV-2 relies upon the viral RNA extraction method, which is the current standard testing method. As a result, the necessity of commercial RNA extraction kits is promptly increasing, that has resulted in a boost for magnetic beads demand throughout the outbreak.

An Outlook on Indian magnetic beads market:

On May 18, 2020, India made history in the fight against COVID-19 by conducting 100,000 sample tests in 24 hours. In just 60 days, a 1,000-fold increase was achieved from >100 tests every day just two months prior.

In the beginning of 2020, there was a time when India had just a single laboratory testing for COVID-19 that was the National Institute of Virology in Pune, reporting to the Indian Council of Medical Research. As of March 2021, there are more than 2730 operating laboratories all over the country (1289 government laboratories and 1441 private laboratories) reporting to the ICMR and performing molecular testing for COVID-19 diagnosis.

The Indian in-vitro diagnostic market is predicted to expand at a CAGR of about 7.10% between 2020 and 2026, with a market value of USD 1255.18 million in 2020 and USD 1990.99 million in 2026.

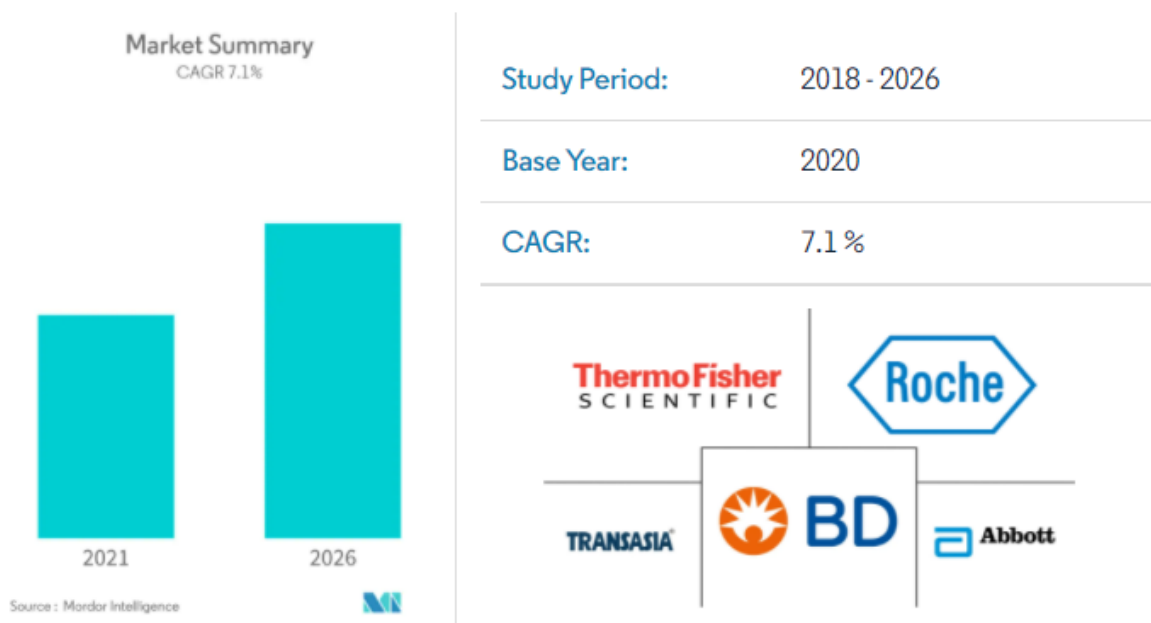


Fig 7. Market Snapshot of IVD market in India. Source: Mordor Intelligence¹⁵

Key Market Trend

Molecular diagnostics segment of the IVD market is projected to increase with a CAGR of 7.12% between the forecasted period

Factors driving the growth in this segment:

This segment has already seen substantial technological developments, and the molecular diagnostic tests price has steadily plummeted, providing more flexibility to patients suffering from genetic conditions and infectious

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diseases. Further, the COVID-19 pandemic in the country has increased demand for molecular diagnostics, propelling the growth of market.

Competitive Landscape

The market in discussion is consolidated, only with some few key competitors. The hurdles for entering into this industry are high for new entrants, and so as a result, merely a few dominant market players hold the leading position.

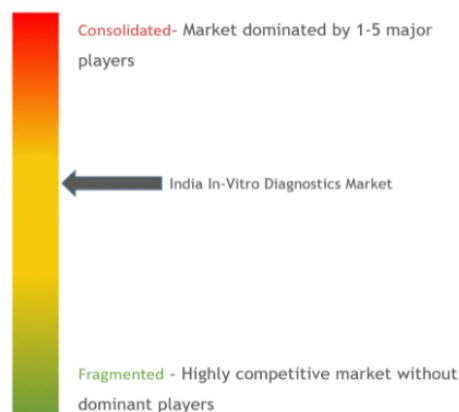
Key players of the Indian Molecular Diagnostics Market are:

- Abbott India Limited
- Cleaver Scientific
- BioMérieux India
- Bio-Techne India Private Limited
- Danaher
- Biocartis
- Roche Diagnostics India Pvt Ltd
- Qiagen India Pvt Ltd
- Becton Dickinson Private Limited
- Bio-Rad laboratories India Pvt. Ltd

Major Players

- 1 Abbott Laboratories
- 2 Becton, Dickinson and Company
- 3 F. Hoffmann-La Roche AG
- 4 Transasia Bio-Medicals Ltd
- 5 Thermo Fisher Scientific

Market Concentration



Source: Mordor Intelligence



Fig 8. Major players and market concentration. Source: Mordor Intelligence¹⁵

Companies are using a range of state-of-the-art strategies to improve existing market position, such as collaborations, acquisitions, and new product releases. For instance:

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- Thermo Fisher Scientific Inc. introduced a cutting-edge manufacturing facility in Bengaluru in February 2021 to develop COVID-19 testing kits and diagnostic solutions.
- In February 2018, Fujifilm Corp marked its presence into India's heterogeneous diagnostics industry by collaborating with Dr Kutty's Healthcare to establish a medical screening center specializing on cancer screening in Bengaluru.

Research Design and Methodology

Exploratory research that has been used to find the potential leads. This was conducted through a rigorous desk research. Secondary research was done focusing on the available literature, while informal qualitative techniques were also incorporated, such as discussions with lab technicians, lab managers, executives, department heads, etc.

Lead Generation and Selection/Recruitment of Target Respondents

STEP 1: Around 1600 leads were generated during the desk research for further screening.

STEP 2: Informal short telephonic interviews (around 1-2 minutes) were conducted to understand the profiles of these respondents.

STEP 3: If the profile of the respondent fits the criteria, he/she was further sent a computer assisted web interview questionnaire via email.

STEP 4: If the quota is fulfilled, the respondent is finally recruited as key opinion leader. In total, 40 respondents were finally recruited.

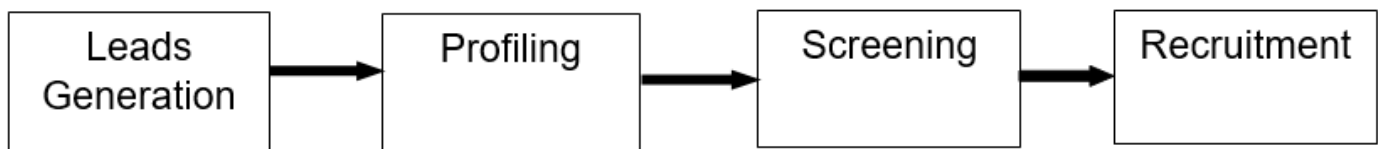


Fig 9. Process of Selection/Recruitment of Target Respondents. Source: Original

Sampling Technique:

Quota sampling technique was used throughout the recruitment process. It is a two-stage sampling technique.

The first stage was to develop quotas of population elements on the basis of control characteristics relevant for the research.

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QUOTA TABLE A

Code	Field of Work	No. of Respondents
1	Research	20
2	Diagnostics	20

QUOTA TABLE B

Code	Types of Diagnostics
1	Molecular Diagnostics
2	Immunodiagnostics

QUOTA TABLE C

Code	Field of work in Research
1	Academia (Academic Institute/ University)
2	Industry (Biotech/ Pharma/ Biopharma company)

QUOTA TABLE D

Code	Field of work in Diagnostics
1	Industry (Biotech/ Biopharma/ Diagnostics company (manufacturer / contractor))
2	Commercial Testing Lab

In the second stage, the sample elements were selected on the basis of judgement. The potential respondent should satisfy at least one characteristic in each category.

1. Primary Organization Type

- Academic/University
- Small or start-up biotech company
- Mid/Large pharma/biopharma company
- Medical Device Company
- Contract development and manufacturing organizations (CDMOs)
- Contract Research Organizations (CROs)
- Pharmaceutical Company
- Research Foundation/Institute
- Hospitals/University Medical Centre
- Commercial Testing Lab/Diagnostic Lab
- Molecular Diagnostics/Immunodiagnostics Company

2. Job Title

- Bioengineer
- Department Head
- Executive (CEO, VP, etc.)
- Lab Manager/Director/ Supervisor/Coordinator
- Laboratory Technician
- Principal Investigator
- R&D Director
- Staff Scientist
- Scientist QA/QC
- Translational scientist
- Clinical trial scientist
- R&D manager

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- Process Development Engineer/Manager
- Innovation leader
- Quality Assurance/Quality Control
- Post Doc Fellow

3. Area of Focus

Recruit as Code 1, Quota Table A	Recruit as Code 2, Quota Table B
Basic Research	Clinical diagnostics
Translational Research	Diagnostic assay/kit development and/or manufacturing
Drug discovery	
Drug product characterization, release testing, or process development	
Preclinical Research	
Clinical Research	

Data Collection Methods and Tools Used

Primary as well as secondary data was gathered during this research.

- The primary data was collected from the potential respondents by Computer Assisted Telephone Interview (CATI).
- The secondary research was conducted for preliminary data mining using already published reputed databases such as news articles, journals, research papers, case studies, news articles, etc. This data was then validated and verified through exhaustive primary research with Key Industry Leaders in the market.

Result

Out of a global population of 1600, a sample size of 40 respondents were selected as the key opinion leaders. The next step is to render assisting services to the client by intermediating in-depth interviews through a software named 'Ameyo'.

References

1. Questionnaire Translation - DIME Wiki [Internet]. Dimewiki.worldbank.org. 2021. Available from: https://dimewiki.worldbank.org/Questionnaire_Translation
2. What are CAPI, CATI and CAWI? [Internet]. Market Research World. 2008. Available from: <http://marketresearchworld.net/content/view/2114/78/>
3. Martínez L. Serology tests: the role of magnetic beads in the fight against COVID-19 [Internet]. Sepmag.eu. 2020 . Available from: <https://www.sepmag.eu/blog/the-role-of-magnetic-beads-in-the-fight-against-covid-19-serology-tests-vaccines-and-purification-of-rna>
4. Klein S, Müller T, Khalid D, Sonntag-Buck V, Heuser A, Glass B et al. SARS-CoV-2 RNA Extraction Using Magnetic Beads for Rapid Large-Scale Testing by RT-qPCR and RT-LAMP. Viruses [PubMed]. 2020 ;12(8):863. Available from: <https://doi.org/10.3390/v12080863>
5. Magnetic Beads, The Needs and The Opportunity [Internet]. Cardiogenics.com. Available from: http://www.cardiogenics.com/market_advantages/CGNH_Magnetic_Beads_The_Needs.pdf#:~:text=Currently%2C%20magnetic%20beads%20are%20the%20most%20widely%20used,diagnostic%20kits%20used%20in%20automated%20clinical%20laboratory%20analyzers
6. Magnetic bead basics - Cytiva [Internet]. Cytiva. Available from: <https://www.cytivalifesciences.com/en/us/solutions/genomics/knowledge-center/magnetic-bead-guide/magnetic-bead-basics>
7. Gane A. Magbeads 101: A guide to choosing and using magnetic beads - Cytiva [Internet]. Cytiva. 2019. Available from: <https://www.cytivalifesciences.com/en/us/news-center/magnetic-beads-a-simple-guide-10001#:~:text=Magnetic%20beads%20are%20made%20up%20of%20tiny%20%2820,in%20the%20presence%20of%20an%20external%20magnetic%20field>
8. Magnetic Beads Market Size & Share Report, 2020-2027 [Internet]. Grandviewresearch.com. 2020. Available from: <https://www.grandviewresearch.com/industry-analysis/magnetic-beads-market>
9. Bilagi C, Mittal N, Prasad E. Magnetic Beads Market Size, Share | Industry Forecast, 2027 [Internet]. Allied Market Research. 2021. Available from: <https://www.alliedmarketresearch.com/magnetic-beads-market-A10375>
10. Ugalmugale S, Swain R. Magnetic Beads Market Size Forecast Report 2027 [Internet]. Global Market Insights, Inc. 2021. Available from: <https://www.gminsights.com/industry-analysis/magnetic-beads-market>
11. Chircov C, Grumezescu AM, Holban AM. Magnetic Particles for Advanced Molecular Diagnosis [PubMed]. Materials (Basel, Switzerland). MDPI; 2019. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6651565/>
12. COVID Testing Labs [Internet]. Icmr.gov.in. 2021. Available from: https://www.icmr.gov.in/pdf/covid/labs/COVID_Testing_Labs_09072021.pdf
13. Behnam M, Cai W, Dey A, Talwar V. COVID-19 and in vitro diagnostics: New market forces at play [Internet]. McKinsey & Company. McKinsey & Company; 2020. Available from: <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/covid-19-and-in-vitro-diagnostics-new-market-forces-at-play>
14. COVID-19: India's Remarkable Story of Ramping-Up and Becoming Self-Reliant in Testing [Internet]. The Weather Channel. 2020. Available from: <https://weather.com/en-IN/india/coronavirus/news/2020-05-21-how-india-ramped-up-its-covid-19-testing-capacity>

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15. India In-Vitro Diagnostics Market | Growth, Trends, COVID-19 Impact, and Forecasts (2021 - 2026) [Internet]. Mordorintelligence.com. 2021. Available from: <https://www.mordorintelligence.com/industry-reports/india-in-vitro-diagnostics-market>

16. India Molecular Diagnostics Market By Application (Infectious Disease, Blood Screening, Genetic Testing, Oncology Testing), By Technology (PCR, In-situ Hybridization, Chips and Microarrays, Others), By End User, By Region, Competition, Forecast & Opportunities, FY 2026 [Internet]. Researchandmarkets.com. 2020. Available from: <https://www.researchandmarkets.com/reports/5146144/india-molecular-diagnostics-market-by-application>