“Application of genomics has made drug discovery investments better"

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MedGenome Inc. is a genomics-based diagnostics and research company delivering the best of health care by decoding genetic information contained in an individual’s genome. Company’s Bangalore facility is claimed to be the highest throughput Next-generation sequencing facility in South-East Asia. In conversation with the **Rahul Koul,** Chief Editor, BioVoice News, the Director of Corporate Planning, Marketing & Communication, MedGenome, **Mr Hiranjith GH** sharedd his insights into the company’s activities in India. Read details:

Please explain the operations of MedGenome in India? How big is the market and its future potential?

MedGenome is the market leader for genomics-based diagnostics in India and South-Asia. The diagnostic arm of the company offers over 278 genetic tests spanning different disease areas such as oncology, neurology, ophthalmology, metabolic disorders and rare diseases, among others. Firm has partnered with over 30 key hospitals in India and has set up genomic centres throughout India.

MedGenome's has a 10,000 Sq. ft laboratory infrastructure with a well-designed work flow and adequate safety and quality measures implemented. It is set up with multiple sequencing technology platforms such as RT-PCR, Microarray, and Sanger sequencing along with Next Generation Sequencing (NGS) platforms. The lab also has a phlebotomy facility wherein patients can offer their blood samples for genetic testing as referenced by a clinician. Company is also the first lab in the country to be validated and certified to run the Panorama^{TM} Non-invasive prenatal test (NIPT) in India. Apart from this, company has a dedicated team of biologists, data curators, bioinformaticians and statisticians who work closely with clients to analyze and interpret large scale genomics data.

The market size of the diagnostic industry is estimated to be as high as USD 1 billion, and growing in double digits year-over-year. We are in an age where Indian biotechnology companies, mostly perceived as generic manufacturers of blockbuster drugs without patent protection, are breaking the mould to innovate and develop products and technologies that are contributing to the advancement of global healthcare. With genomics being the future of healthcare, MedGenome has a great opportunity to be a global player.

What kind of analytical and algorithmic pipelines are being built by the company to interpret genomics data? What makes them different than the competition?

MedGenome's bioinformatics expertise offers end-to-end data analysis of next generation data using proprietary interpretation tools and algorithms. Our algorithm and analytical pipeline includes various in-house tools for comprehensive high-throughput annotation tool for analysis of germ line and somatic variants, high performance web-based tools for variant interpretation, tools to capture patient information including the clinical symptoms of the patients enabling clinicians to catalogue phenotype in formation of the patient in a systematic and controlled manner, software platform with a modular architecture for handling next-generation genomic sequencing pipeline from data generation to analysis and various proprietary databases such as the one with India population specific variant data and the one with millions of somatic cancer variant annotations.

Our analysis components include data quality assessment, comprehensive custom analysis, interpretation of results for biological insights, and presentation of results to the customers in meaningful, easily readable report formats. Being a leader in diagnostics and research from India, MedGenome continuously refines and improves the pipeline to make the analysis more powerful.

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to innovate and develop products and technologies that are contributing to the advancement of global healthcare."

Which of the top disease areas are under the company's focus and why?

MedGenome offers more than 278 tests across different disease areas: Cardiology, Metabolic disorders, Haematology, Ophthalmology, Neurology, Nephrology, Oncology, other rare disorders etc. We also address important research questions in hereditary diseases. As of now the company is extensively focusing on the problems that are affecting the population at large such as cancer, diabetes, cardiovascular diseases, eye disorders, neurological and blood disorders. We have developed specific gene panels that can identify mutations mostly found in the Indian population.

How is the next generation sequencing shaping up, its future trends and effect on the overall drug discovery efforts?

Genomics has seen rapid advances in the technology of decoding the DNA, triggering a revolution in our ability to understand the genetic and molecular basis of health and disease. The evolution of Next Generation Sequencing (NGS) has significantly reduced the time and cost for genome analysis. These advances have highlighted its relevance in exploratory research and drug discovery, and have translated to a significant influx of capital into the molecular diagnostics firms due to their cutting edge technologies, the mapping of the human genome and a wave of new biologic drug product approvals by the FDA.

The increased value of genetic testing in medicine has led to significant amount of precision medicine research, which has in turn resulted in the development of many targeted therapies and companion diagnostics, especially in the field of oncology, which has revolutionised the way patients are treated, and has given them a real chance at recovery. And it is seen that this trend is applied in other disease areas as well such as neurology, ophthalmology and metabolic disorders

From a drug discovery point of view, presence of genomic biomarkers is helping the research program to have a higher probability of success through more targeted approaches for patient selection. The FDA approval is also smoother with specific markers involved to explain the effectiveness of a drug. Overall, the application of genomics has made the drug discovery investments better in terms of returns.

What kind of business model has MedGenome employed in India? How has been the growth financially as well as in terms of global expansion and partnerships?

MedGenome provides an end-to-end integrated solutions for clinical diagnostics in India. We work with hospitals and clinicians in the country to offer diagnostics services based on genomics. MedGenome offers pan- India sample collection, monitored by state-of-the-art management information systems, offering all technology platforms for sequencing and advanced analytics for high-end interpretation. All these in collaborations with hospitals, doctors within hospitals and specialty labs across the country.

For institutions with research focus, MedGenome partners to establish research and diagnostics centres pooling in the combined capabilities of both the institutions. Company invests in designing, building and maintaining such genomics centres within the partner institutions. These genomic centres at key locations across the country also facilitate the dissemination of scientific knowledge to the local population, while allowing them to avail of cost-effective genetic testing, an expensive option if availed of abroad. They also help in reduction of time for diagnosis and cost of treatment by enabling early diagnosis, and facilitating preventive measures like family screening.

We have almost doubled in revenues in FY 2015 compared to last year. Our international collaborations have also seen fruit across various countries primarily because of the high quality and affordable testing that we offer in this region.

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What is the future outlook of the company including the short and long term plans?

MedGenome is a pioneer in genomics-based diagnostics and research in India and we intend to expand our base by penetrating deep into the market. Our strategic collaborations and future expansion is towards familiarising and creating awareness regarding genetic tests even to the remote corners of India. Our mission has always been to improve global health by developing deep insights into diseases at the genetic and molecular level. MedGenome aims to be a global player in genomics in the coming years.

Expansion of our academic research collaboration is a focus. MedGenome is developing targeted collaborations with both Indian and international academic institutes and scientists, to whom our genomic research capacities, will be showcased. At a global level we plan to expand our genetic diagnostics and academic research collaboration in various geographies including Middle-East and South-East Asia, and in countries where there is a huge burden of genetic disorders.

Experts say India has the potential to be the diagnostic capital of the world but there are challenges. How would you comment on this?

The future of the industry is promising. However it brings with it a necessity for better data management and conversion to clinical application. Doctors and hospitals in India are also taking a big step in educating their patients. Advances in bioinformatics have improved the quality of insights generated from the analysis of genomic data; but the flood of genomic information continues to challenge our existing analytical capabilities.

Certain factors like regulatory body approval, and reimbursement from insurance companies may prove to be crucial in determining the growth of this industry. In the western world, insurers have started accepting genomic tests in their formulary as it is expected to reduce the cost of down-the-line treatment. In India, these tests are yet to be offered at affordable prices. There is also a great need for clinicians who have a good understanding of genomics and its clinical significance. The patient journey must be well managed so that if a particular condition is identified, the experts are brought in to handle the situation and help the individual. There is a dearth of genetic counsellors who can explain genomics findings to the affected individuals and their families. In addition to this, factors like lack of resources for effective data analysis, cost of technology, lack of baseline genomics data of Indian origin and unclear policies on intellectual property rights also pose hindrances to the industry.

Overall, genomics offers a plethora of opportunities that are yet to be seized. The greatest benefit that can come from the application of genomics to human health care is to provide prescribers and individuals with useful insights into their genotype which will enable them to take preventive/curative steps for their disease management.