

“STRAND NGS 3.0 ALLOWS USERS TO ANALYZE DATA AT NEARLY TWICE THE SPEED”

The Bangalore based Strand Life Sciences has been recently in news for the back to back launch of two innovative products. One is the next generation sequencing tool, Ramanujan and second is the liquid biopsy test for the cancer diagnosis. In an exclusive interview with the BioVoice News, Dr Vijay Chandru, Chairman and Managing Director of the company shared detailed insights on the products and the overall trends. Read the interesting biochat in two parts:

BY RAHUL KOUL

Congratulations on the release of new 3.0 version of your NGS Platform. Why did you choose to name it as Ramanujan? How is it novel or remarkable as compared to imported technologies?

Thank you. Our NGS platform, Strand NGS, is just one part of the Strand Ramanujan stack of artificial-intelligence (AI) powered platforms created and marketed by Strand Life Sciences. Strand Ramanujan is representative of India’s ability to produce world-class AI platforms to aid in disease

prevention, diagnostics, and treatment, and capable of competing with the likes of IBM (Watson Health™) and GE (Predix®).

Over a period of 15 years, Strand has continuously built on and leveraged this stack of AI platforms, christened “Ramanujan” after two great intellectuals of Indian origin for their mathematical and linguistic prowess: S. Ramanujan (1887-1920) the genius mathematician who greatly contributed to number theory which has regained new significance in the age of computer technology and A.K.

Ramanujan (1929-1993), the literature scholar and linguist extraordinaire. At the core of Ramanujan, is Strand’s proprietary natural language processing (NLP) platform Grammatica that powers Strand’s products, including the market-leading gene expression analysis software GeneSpring (marketed by Agilent Technologies, Inc.), Strand NGS, the powerful NGS data analysis and visualization platform, and StrandOmics, enabling fast and accurate clinical variant interpretation and reporting.

The remarkable



differentiator of Strand Ramanujan is the range of tasks it carries out. As the image below indicates, Strand Ramanujan is an end-to-end intelligence augmentation platform that manages workflows of a diagnostic lab from sample collection through clinical interpretation and reporting. We are unaware of any platform anywhere that competes with Ramanujan in “end-to-end”. This translates into Strand’s unique

ability to provide accurate reports with aggressive turn-around times and at reduced costs which will only improve at scale.

What are the latest global trends in next-generation sequencing technology that will revolutionize medical sciences? Is India contributing enough?

One major trend in next-generation sequencing is the continuously reducing

cost of sequencing. NGS technologies are following a rapidly accelerating exponential law that has come to be called “Flatley’s Law”, which is moving at roughly the square of Moore’s law since 2008. India is not in a position to really make a dent in the sequencing technology platform technologies today. However, as sequencing kits and instruments become cheaper we anticipate



just beginning to adopt NGS methods.

The combination of Strand NGS, our vast curated information, and our interpretation and reporting software, which are all part of Strand Ramanujan, can aid in speedy adoption of NGS in clinical diagnostic laboratories world-wide. Therefore, through recombinant innovation, companies like Strand from India are contributing by adding layers of world class bioinformatics and AI platforms to bring in “affordable excellence” in genomic testing.

that the overall amount of sequencing data that is generated in the clinical diagnostic space will increase dramatically.

Unfortunately, clinical diagnostics sequencing is just the first step of the process. The generated data needs to be analyzed by bioinformatics tools and the right variant needs to be identified amongst the thousands (or millions) of variants detected in the sample. While sequencing a whole genome at \$100 may be possible in the next few years, interpreting the data remains a million-dollar problem and Strand

has made significant strides towards reducing the post-sequencing cost of testing.

Strand NGS 3.0 allows users to analyze data at nearly twice the speed of the most commonly used pipeline, reduces storage costs by nearly 60%, provides managed storage and in-built visualizations for variant verification - all without sacrificing accuracy. The user-friendly interface of Strand NGS insulates users from the complexity of NGS analysis and makes large panel analysis easy even for pathology labs which are

Please tell us more about your plans to build a clinical genomics database for genomics medicine in oncology? What will be its impact?

Strand carries out multiple molecular tests that cover the entire oncology spectrum - hereditary cancer risk prediction, somatic tumor profiling and therapy recommendations, and recently introduced

liquid-biopsy-based tumor monitoring. Beyond that, pro-active gathering of clinical history and outcomes information combined with the molecular information that Strand identifies from its sequencing tests can lead to powerful insights and help inform the creation of India specific guidelines.

All this is enabled by StrandOmics, our proprietary platform for interpretation and reporting. StrandOmics integrates knowledge from all the public databases of variant-phenotype correlates along with knowledge curated from published literature using text mining and expert curation by highly skilled senior scientists at Strand. Over 6,000 clinical samples have been taken through the platform and this has contributed to a pooled database of Indian (South Asian) ethnicity genomes. As our tests are being adopted as standard of care in leading cancer hospitals, we believe that Strand can rapidly build a clinical genomics database at a scale which



could make India a future leader in onco-genomic medicine.

What would be the top five priorities of Strand Life Sciences during 2017 and next few years?

Strand Life Sciences will continue to expand its portfolio of products on both the Bioinformatics and Clinical Diagnostics side. The science behind both fields is constantly evolving with new research insights being published every day, so in order to keep up with these advances and to stay relevant for our customers our products have to evolve, too. Apart from

expansion, there is always scope to enhance scientific depth and accuracy as the science and technology progress and hence a lot of our R&D efforts will be focused in this direction. On the clinical diagnostics side, while we get benchmarked against the world's best, we also believe in the "Make in India" mandate, in particular, providing our products at affordable cost is a serious part of our vision.

We plan to expand reach by ensuring that our product network is made wider by reaching multi-specialty doctors and larger number of hospitals in India. Strand believes

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every individual who wants to get screened, tested and regularly monitored should have access to these tests. As an organization, we believe this will minimize the disease burden on our economy and the financial burden on individuals. We also look at driving a larger alignment within doctor and patients towards precision medication and how relevant genetic diagnostics can support that.

Align with government on helping form policies

that would drive alignment towards need for precision treatment in the areas of Oncology and Rare Diseases.

Why don't we see more indigenous startups or companies venturing into NGS?

A space like NGS requires a high level of versatile intellect from the perspective of bioscience and bioinformatics. This obviously means aggregating the best of minds in both areas to collaboratively work together. For Strand Life Sciences, it has been a decade plus journey to get the levels of product depth, quality and market share it has today.

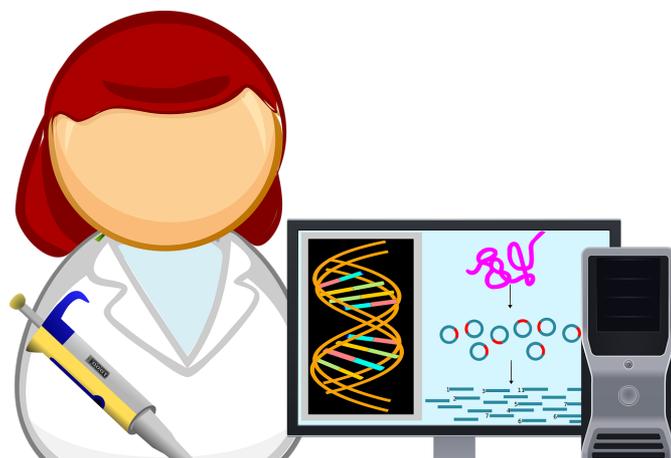
Genomic analysis also falls under the ambit

of big data. This space requires continuous innovation and investment that most commercially inclined organizations may not have the passion, patience and perseverance for.

Strand Life Science as an organization has always tried to ensure a fair balance of academic spirit, with its Indian Institute of Science lineage, and market approach.

How do you compare the past & future of Indian biotech industry? What are the challenges & opportunities?

A few companies focused on different aspects of biotechnology emerged. These were on the bioinformatics or



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diagnostics side. Over the years, one has either seen consolidation of these companies to include these under the same umbrella via aggregation.

With the Indian talent pool being trained across the best universities in India and globally, we are able to build products and services that are benchmarked against the world's best at affordable cost. It is only a question of time when these will be leveraged across the huge domestic market

and also across the globe. This is the scenario we foresee across Strand Life Science's products.

Markets will also see closer collaborations between biotech and pharmaceutical companies to offer more comprehensive treatment options.

The biotech industry still requires significant research and innovation in varied areas. The investment ecosystem still continues to support IT and other online industries, partly because of lack of depth and understanding of the unique funding requirements of the biotechnology industry and also the need for higher

investments to fund continuous development.

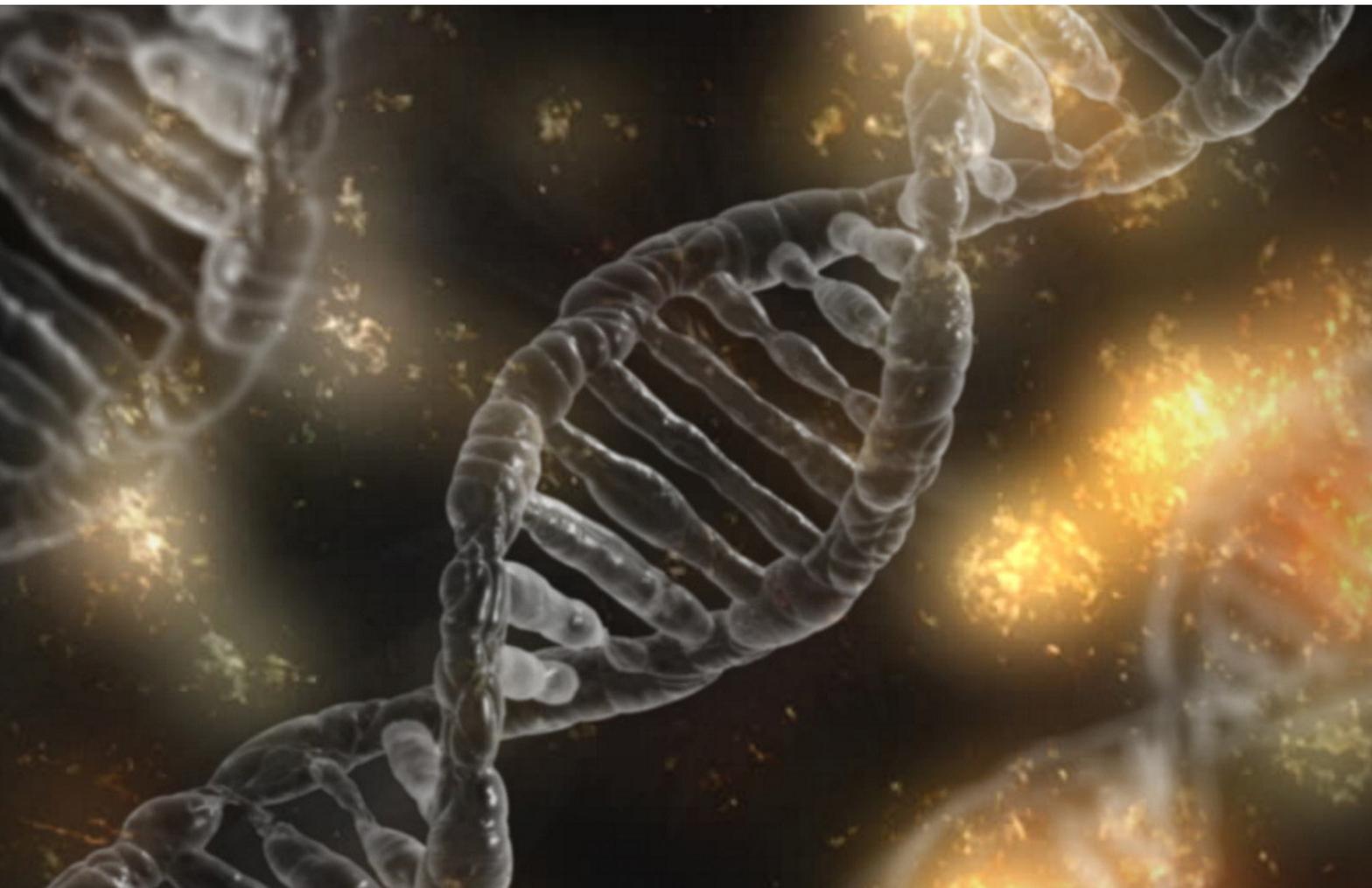
The regulatory landscape of the industry swings between extreme regulatory environments in some areas and no regulation at all in others like for example genetic testing. Government thinking and policies in this direction would create larger adaptability.

In certain areas, a large number of me-too companies exist. These companies are offering varied levels of quality of product and service. Over a couple of years there would be consolidation or a market shake out is likely, as can already be observed in the US market. ■



“STRAND LB HELPS IN IMPROVING THE QUALITY OF LIFE OF THE PATIENT”

Strand Life Sciences has announced the launch of their Liquid Biopsy test portfolio ‘Strand LB’ that provides highly sensitive detection of tumor traces from a simple blood draw. In this part of the interview, Dr Vijay Chandru, Chairman & Managing Director of the company shared the details on how it is a powerful tool to detect early and precise indication of tumor presence or cancer recurrence





How would the liquid biopsy test revolutionize cancer diagnosis and treatment?

Strand LB tests play a critical role in cancer diagnostics. The test is beneficial to patients at several stages – early detection, review and monitoring of non-biopsiable tissue and finally for regular monitoring and review post surgery.

In cancer treatment, the thumb rule is that prognosis of survival is

higher when the disease is detected at an early stage. A common example in the case of breast cancer is that stage one has almost 100% 5-year-survival rate compared to stage four which has a meager 22% survival rate.

Liquid biopsy has provided this opportunity to the patient where with the help of a simple blood draw, diagnosis can be made along with identification of genetic markers (EGFR, KRAS, TP53). One challenge with this technique is limited tumor DNA present in

the blood.

Strand LB has been able to overcome this by developing the ability of detecting one tumor DNA molecule in 1000 normal DNA fragments. The best-in-class bioinformatics capabilities also reduce the output time to only 5 working days. This helps the patient and physician to be proactive when making treatment choices rather than reactive and reduces the disease and financial burden of the patient.

In addition, some of

“ On the cost front, liquid biopsy is cheaper than solid biopsy/ PET scans done at a private hospital. Also, since it is a simple blood draw, there is no need for hospital admission, thus reducing the cost of treatment

the current monitoring approaches involve scans which expose patient to radiation.

Strand LB requires a simple blood draw and therefore minimizes the patient’s need for exposure to radiation and other risks associated with repeated tissue biopsies that also involve surgical intervention.

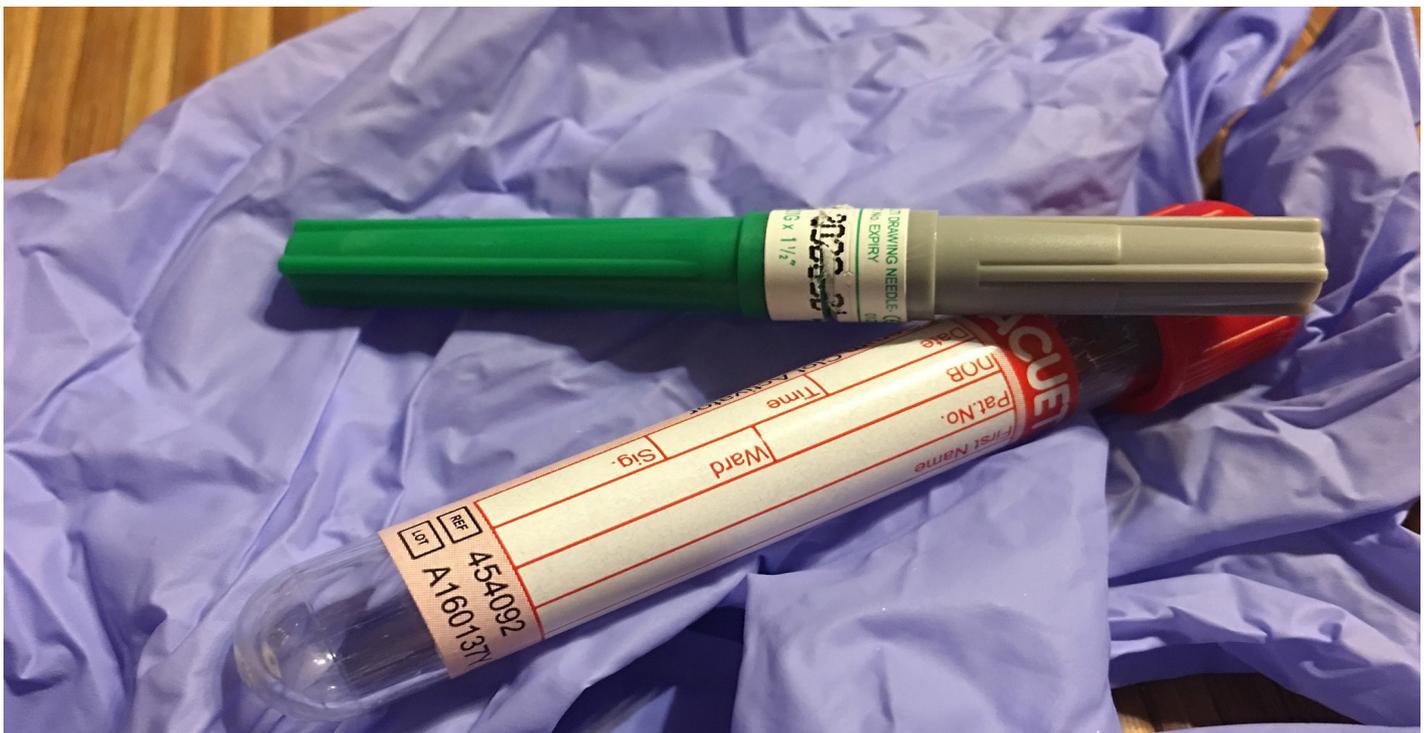
Please tell us about the years of research effort and funding put into its development?

The research effort has lasted for a couple of years and all the funding is done from in house resources. Strand runs a mature and profitable bioinformatics business.

The test was indigenously developed at Strand Life Sciences, Bangalore and clinical validation was done in collaboration with Mazumdar Shaw Cancer Center & TMC, Mumbai.

How can the patients access liquid biopsy test?

The test is available to the public and can be ordered via an oncologist in all major hospitals across India. The details of the test are also available at our website www.strandls.com and can the test can be ordered via the same website as well.





Is the test process simpler than existing alternatives? How cost effective is it?

A cancer patient is under tremendous mental and physical stress while undergoing treatment. There are major or minor surgical interventions followed by exposure to cytotoxic chemotherapy and radiation inducing PET scans.

The option of Strand LB helps in improving the quality of life of the patient because of its simplicity. It is essentially a simple blood draw that can be done at a

hospital or at the patient's home. As an alternative to the solid biopsy it is minimally invasive and therefore reduces pain. Strand LB can be performed multiple times at regular intervals for disease monitoring, which is not possible in the case of solid biopsy. The technique also helps in limiting exposure to harmful radioactive waves during currently routine follow-up PET scans.

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