Genomics research holds the answers to many of the healthcare challenges present today. Cost for genetic testing has plummeted as advances in sequencing technology have made individual genome sequencing economically feasible. Emergence of new techniques has reduced cancer detection time through DNA liquid biopsy test, which are noninvasive screening options. Revolutionary gene editing techniques such as CRISPR-Cas9 may soon offer innovative ways to modify genes to treat rare genetic diseases and create better food supply in agriculture.

The new frontiers opened by healthcare technology innovations are leading to unprecedented opportunities for better healthcare. Leveraging large amounts of data collected through pharmacogenomics, direct-to-consumer genomics and wearable devices, new players are building technology for medical people to gain deeper insights into bringing innovation in healthcare delivery. Companies are leveraging big data analytics in healthcare, through AI and deep learning to provide a more applicable knowledge of the human genome. Subsequently adopting cloud-based software for faster and better analysis of genomic information such as the GATK software, which is now available as a software-as-a-service.

To help CTOs, CIOs, and CEOs find the right genomics solution provider, a distinguished selection panel comprising of CEOs, CIOs, VCs, industry analysts, and the Pharma Tech Outlook’s editorial board has selected a list of Genomics Solution Providers that exhibit innovative technologies combined with cloud strategies.

We have considered the vendor’s ability in building solutions and services that can effectively yet economically account for a productive genomics solution, keeping in mind the factor of time-focused delivery. We present to you Pharma Tech Outlook’s Top 10 Genomics Solution Providers - 2017.

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<tr>
<th>Company</th>
<th>Description</th>
<th>Key Person</th>
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<tr>
<td>Interpreta</td>
<td>The company continuously updates and interprets clinical and genomic data to provide real-time analysis of healthcare information at the single patient and population level</td>
<td>Dr. Ahmed Ghouri, Founder &amp; CEO</td>
<td>interpreta.com</td>
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The healthcare industry is constantly seeking new methods for tailoring care to individual patients for improved clinical outcomes. Dr. Ahmed Ghouri, Founder and CEO of Interpreta, believes that the future of medicine lies in the continuous interpretation of clinical and genomic data as opposed to episodic review and episodic care. Moving towards this new approach of continuous treatment optimization requires bridging the gap between clinical and genomic science (the macroscopic world a doctor sees and the molecular world of DNA).

In light of this, Interpreta provides an analytics engine that continuously updates, interprets, and synchronizes clinical and genomics data, creating a personalized roadmap of the future that enables the orchestration of timely care in both dimensions. The company was founded when three seasoned technology entrepreneurs, Dr. Ahmed Ghouri, Gary Rayner, and Raghu Sugavanam realized that the domain of genomic interpretation (“precision medicine” using molecular data from DNA and RNA) was disjointed from clinical interpretation (protocols as defined in clinical care guidelines). New tools were required for bridging this profound gap so that doctors can prioritize action items holistically.

Elucidating the current scenario, Dr. Ghouri provides an example of a patient with high blood pressure (hypertension) who is prescribed a medication in safety compliance with his genome in January. At the time of prescribing, there were no known drug-gene safety concerns for the drug. However, in March, the FDA published new information about his gene variant which confers a high risk of liver toxicity while taking the prescribed drug.

Since the physician is unaware of the new FDA-based knowledge, he continues to renew the drug for the patient, as it appears to control blood pressure well. However, within a year, the patient starts suffering liver damage due to drug toxicity, which was avoidable. The situation could have been prevented if re-assessment of the patient’s treatment plan was done daily, as knowledge of genomic variants with drug compatibility is continuously growing. Therefore, clinical and genomic interpretation need to go hand-in-hand on a continuous basis, not just at the time of prescribing. In summary, a one-time-only check of the original prescription was not safe for this patient; the drug should have been discontinued when newer knowledge arrived from the FDA three months later, despite the blood pressure being under good control.

\[\text{The clinical benefit of Interpreta is that we can avoid toxicity in patients and the financial benefit is reduced hospitalization costs due to adverse drug event prevention,}\]

Interpreta’s powerful analytics engine performs real-time clinical and genomic interpretation on a continuous basis, analogous to a GPS navigation system. Like a GPS system, Interpreta’s engine computes a forward view of a personalized care plan, recalibrates the plan as soon as new data arrives, and applies knowledge that is never more than 24 hours old.

"The clinical benefit of Interpreta is that we can avoid toxicity in patients and the financial benefit is reduced hospitalization costs due to adverse drug event prevention," says Dr. Ghouri. Adding to its efficiencies is Interpreta’s AI-based Member Prioritization Engine that continuously re-computes information to score patients every day for new risk. With this, Interpreta delivers precision guidance to medically assess every individual. It determines who is the most in need, the kind of care required, the remaining time to act, and the right clinician to contact, based on urgency and severity. Most important, both clinical and genomic considerations are processed at the same time to generate the prioritization.

To carry out unified and real-time analysis, Interpreta merges data from disparate sources—insurers, EMRs, gene sequencing companies, and retailer biometric readings—into a central cloud platform that uses microservice APIs and single-sign-on technology for easy and secure access by key stakeholders. Interpreta’s diverse data sources combined with real-time interpretation is unmatched in the industry.

According to Dr. Ghouri, "Our uniqueness is that caregivers do not require new devices, interfaces, or tools to derive value. Data is brought together from established sources in a timely fashion, synchronizing clinical and genomic data, and, most crucially, interpreting it against today’s knowledge instead of yesterday’s.”

What Interpreta is able to do today through its intelligent data analytics engine is still considered a farfetched idea for numerous healthcare organizations that have not seen its capabilities. Interpreta has turned the holy grail of continuous treatment optimization into reality.