Accenture Puts Data Science to Work for Pediatric Leukemia Research

NEW YORK; Sept. 23, 2020 – Accenture (NYSE: ACN) today announced that it has built a data and analytics approach to manage and derive insights from pediatric acute myeloid leukemia (AML) genomic data. Working in collaboration with researchers and clinicians from Fred Hutchinson Cancer Research Center (Fred Hutch), and the Target Pediatric AML (TpAML) computational working group, a large-scale research project which supplied the data, this new approach aims to enable pediatric oncology physicians and researchers — specifically those focused on pediatric AML — to better analyze patient clinical trial and genetic data, with the potential to improve precision medicine.

In collaboration with the TpAML investigators, led by Dr. Soheil Meshinchi at Fred Hutch, Accenture data scientists aggregated and standardized anonymized genomic and clinical data from over 2,000 children with AML, treated in clinical trials. RNA data alone, one of the most critical indicators of treatment outcomes in precision medicine, amounts to over 48,000 columns *per patient* if managed in a standard table format. Combined with other relevant data points — such as patient demographics, clinical treatment arm, and prognosis — the sheer volume and variety of combinations presents a significant hurdle to comparing patient profiles and outcomes at scale.

"The Accenture data scientists who worked with the TpAML team had the clinical and genomic background knowledge to hit the ground running. We model this type of collaboration in all of our engagements so that we're able to anticipate challenges and navigate them with speed," said Joe Depa, a managing director for Accenture Applied Intelligence. "In this case particularly, I am pleased that we were able to leverage the power of data and analytics to make this information more accessible to researchers, potentially advancing precision medicine and helping improve people's lives."

Through this engagement, TpAML investigators provided access to the sequencing data and guidance on key data points — including genetic markers, clinical trial treatment details, and clinical outcomes — that can define a patient's response to a particular treatment at the time of diagnosis (prior to the start of chemotherapy). These insights could help inform the recommended course of treatment, giving patients and physicians a more robust view of likely clinical success and side

effects with standard therapy, based on an individual patient's genetic makeup and medical history. This approach may provide a more informed pathway to more effective precision medicine for pediatric AML, where therapy might be modified based on patients' predicted response to standard therapy – i.e., high-risk patients may be allocated to bone marrow transplantation or targeted therapies.

"Integration of genomic and clinical data and getting it into a usable, accessible format is a significant challenge in precision medicine," said Dr. Meshinchi. "This collaborative effort between TpAML investigators and Accenture data scientists provides a mechanism to more informed analysis of clinical and genomic data, and could help identify patients at high risk of failure with conventional treatments. Validation of these findings can help modify patients' treatments based on their relapse risk."

By applying data science and engineering tools, such as Alteryx and Python, and machine learning libraries like scikit-learn, to this corpus of information, Accenture was able to create a code base that clinicians are using to model, understand and potentially predict how patients may respond to specific treatments. Data was made further accessible and consumable using Unity 3D visualization, offering a more interactive way to view the data in a game-space environment, laying a foundation for advanced, dynamic visualizations and VR experiences which could help clinicians potentially identify anomalies, or which they could use as an interface to present findings.

"For years, patients diagnosed with a disease often received the same treatment. And for some people, that treatment worked. However, for others, it did not work – or did so only marginally, or with serious side effects. With genome mapping, in combination with new analytical, scientific and technological advances, it is possible to develop targeted, more precise, personalized treatments for individuals or similar patient populations," explained Stuart Henderson, global Life Sciences lead for Accenture. "Precision oncology is delivering on the promise of better patient care and health outcomes in remarkable ways and we look forward to seeing more projects like this TpAML investigation."

This project builds on Accenture research underscoring the importance of data management and sharing to drive precision oncology, and the role of data and genomics in biopharmaceutical development.

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