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At Novartis, we believe our pipeline of people and ideas is every bit as important as our industry-leading pipeline of products. This is especially true within our Data Science organization, where the combination of machine learning, artificial intelligence and diverse teams with innovative ideas is making positive improvements in cancer care.

The opportunity to bring wide-ranging and creative ideas to solve complex challenges was one of the driving forces behind the design and development of the Novartis first annual Great Oncology Hackathon, produced and hosted by the US Strategic Data & Digital team within Novartis Oncology.

The Hackathon Focus – Metastatic Breast Cancer

For its inaugural year, the event focused on metastatic breast cancer (MBC), an advanced form of breast cancer. Nearly 30% of those diagnosed with early-stage breast cancer will ultimately develop MBC, for which there is currently no cure.[1] The Hackathon aimed to help those living with MBC to more accurately and quickly identify when they needed to transition from a first-line therapy to a second-line one, making it more likely the cancer cells could be outsmarted and staying one step ahead of the disease. Timing of treatment was a critical question that data scientists tried to address with machine learning and artificial intelligence algorithms using real-world data.

Novartis, in collaboration with Deliberate Innovation, invited select university data science programs to form teams to participate in the Hackathon. More than 100 graduate students across a wide array of academic disciplines applied, with 12 teams of four to six participants ultimately selected.

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>
> **Belen Fraile, MD, MSc,** US Head of Strategic Data & Digital

All teams were given sets of data to analyze and asked to use a variety of data science methodologies to creatively solve challenges, including accurately predicting when a patient may be clinically diagnosed with metastatic breast cancer and when a patient is likely to progress to the next "line of therapy".

The winning teams were New York University in first place; teams from New Jersey Institute

of Technology, Johns Hopkins University and University of Cincinnati in second; and Columbia University in third. These teams identified data science methodologies that were able to closely time the point of progression when a change in therapy was warranted. Congratulations to them and our thanks to all who participated in the competition.

"Our goal was to engage with university students on a real-world data science challenge to address a critical need in the metastatic breast cancer community," said Belen Fraile MD, MSc, US Head of Strategic Data & Digital. "Through this successful initiative, we were able to confirm a need and desire to bring academia and industry closer together to jointly address this terrible disease. We look forward to continuing to work with academia and other stakeholders to accelerate the pace of change in healthcare and further support patients along their journey of treatment."

"Working with real biomedical clearinghouse data was unique, challenging and interesting, and it gave a sense of realism to those who will work with patient data for exploratory analysis for drug discovery," said AJ Adejare of the University of Cincinnati. "Our diverse team, comprised of individuals with backgrounds in computer science, biomedical engineering, biomedical informatics, and molecular biology, worked together to leverage our strengths and learn from each another. Our work ethic, flexibility and interdependence aided our interdisciplinary team to win second place."

Disclaimer:
> References:
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> 1. O'Shaughnessy J. Extending survival with chemotherapy in metastatic breast cancer. Oncologist. 2005;10 (Suppl 3):209. [PubMed [3]]

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