

IBM Watson Health and Broad Institute Launch Major Research Initiative to Study Why Cancers Become Drug Resistant

- \$50M research collaboration combines genomic data and IBM Watson to help researchers uncover why tumors become resistant to treatment - Data to be made publicly available for research

CAMBRIDGE, MA - 11 Nov 2016: IBM Watson Health (NYSE: [IBM](#)) and the [Broad Institute](#) of MIT and Harvard today announced a research initiative aimed at discovering the basis of cancer drug resistance. The five year, \$50 million project will study thousands of drug resistant tumors and draw on Watson's computational and machine learning methods to help researchers understand how cancers become resistant to therapies. The anonymized data will be made available to the scientific community to catalyze research worldwide.

IBM Watson Health and the Broad Institute bring the data prowess of Watson to study cancer drug resistance in a \$50M research collaboration. The goal is to identify patterns that could reveal clues into one of the greatest medical mysteries of cancer. Ultimately, scientists hope to use knowledge about how cancers become resistant to create combination therapies that prevent resistance from occurring. (Courtesy of the Broad Institute)

While a growing number of cancer treatments can hold cancers in check for months or years, most cancers eventually recur. This is in part because they acquire mutations that make them drug resistant. The development of drug resistance is a major cause of nearly 600,000 annual cancer deaths in the United States alone(1). In a limited number of cases, scientists have discovered the cause of drug resistance, allowing the development of new drugs to overcome resistance. In most cases, however, the causes of drug resistance are not fully understood.

To help understand how cancers become resistant to specific therapies, Broad Institute will generate tumor genome sequence data from patients who initially respond to treatment but who then become drug-resistant. Broad will use new genome-editing methods to conduct large-scale cancer drug resistance studies in the laboratory, to help identify tumors' specific vulnerabilities. IBM scientists will use Watson to analyze this data and identify genomic patterns that may help researchers and clinicians predict drug sensitivity and resistance.

This new partnership is expected to help lay a new foundation for understanding the basis of drug resistance in cancer – especially the genetic mechanisms observed in patients – and accelerate research across the cancer community to turn knowledge of resistance mechanisms into therapies.

“Defeating cancer involves playing a high-stakes game of biological chess. When we make a move with a therapy, cancer often responds with a counter-move by finding a way to become resistant. The key will be learning from clinical experience, so that we know cancer’s moves in advance and can plan strategies to cut off its escape routes,” said Eric Lander, founding director of the Broad Institute. “Knowing how cancers can become resistant will ultimately require learning from hundreds of thousands of patients’ experiences. We’re proud to work with IBM to make an important start toward this goal, and to make the information broadly available to the scientific community.”

“The Broad Institute is leading the industry in areas of cancer biology, genomics and computational biology, and we are proud to bring Watson’s data prowess to help researchers learn more about one of most important medical challenges that too often stands in the way of effective cancer treatment,” said John Kelly III, senior vice president, Cognitive Solutions and IBM Research. “Watson is already being used in the clinic to aid clinicians in cancer care. Our hope is that this effort, if successful, could eventually lead to significant breakthroughs. Someday, patients who would not otherwise have options in their battle against cancer may have reason for hope.”

“Currently, cancer researchers have access to genomic information from only a few hundred drug-resistant cancers samples. In addition to the goals of this specific study, IBM and Broad are committed to advancing cancer research by sharing the data from thousands of tumor samples with the scientific community to accelerate progress everywhere against cancer,” said Todd Golub, M.D., chief scientific officer and founder of the cancer program at the Broad Institute. “What we and many others will learn with this information will have important implications for the future of cancer precision medicine and cancer diagnostics.”

Earlier this month, IBM and Quest Diagnostics launched *IBM Watson Genomics from Quest Diagnostics*, a service available to oncologists nationwide to help advance precision medicine by combining cognitive computing with genomic tumor sequencing. The collaboration with the Broad Institute announced today is the latest application of Watson for Genomics to help researchers and clinicians tackle the challenges and opportunities of cancer genomics.

About IBM Watson Health

Watson is the first commercially available cognitive computing capability representing a new era in computing. The system, delivered through the cloud, analyzes high volumes of data, understands complex questions posed in natural language, and proposes evidence-based answers. Watson continuously learns, gaining in value and knowledge over time, from previous interactions. In April 2015, the company launched IBM Watson Health and the Watson Health Cloud platform. The new unit will help improve the ability of doctors, researchers and insurers to innovate by surfacing insights from the massive amount of personal health data being created and shared daily. The Watson Health Cloud can mask individual identities and allow this information to be shared and combined with a dynamic and constantly growing aggregated view of clinical, research and social health data. For more information on IBM Watson, visit: ibm.com/watson. For more information on IBM Watson Health, visit: ibm.com/watsonhealth.

About the Broad Institute of MIT and Harvard

Broad Institute of MIT and Harvard was launched in 2004 to empower this generation of creative scientists to

transform medicine. The Broad Institute seeks to describe all the molecular components of life and their connections; discover the molecular basis of major human diseases; develop effective new approaches to diagnostics and therapeutics; and disseminate discoveries, tools, methods, and data openly to the entire scientific community.

Founded by MIT, Harvard, Harvard-affiliated hospitals, and the visionary Los Angeles philanthropists Eli and Edythe L. Broad, the Broad Institute includes faculty, professional staff, and students from throughout the MIT and Harvard biomedical research communities and beyond, with collaborations spanning over a hundred private and public institutions in more than 40 countries worldwide. For further information about the Broad Institute, go to <http://www.broadinstitute.org>.

Sources:

(1) *American Cancer Society, Cancer Facts and Figures 2016*, accessed at <http://www.cancer.org/research/cancerfactsstatistics/cancerfactsfigures2016/>

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