

IT'S IN THE GENES

Several years ago, futurist Juan Enriquez told a TED talk audience that he was interested in the dramatic changes the study of genomics and health sciences will have on society.

“It’s the single greatest mapping project we’ve ever been on,” he explained. “If you think that the mapping of Americas made a difference or landing on the moon made a difference ... [genomics] is the mapping of ourselves”

Genetic study has spawned newer fields of work — precision medicine, pharmacogenetics, and tissue engineering — each attempting to better understand how our genes react to drugs and treatments, and how they might even be predictors for the onset of disease.

Precision medicine seeks to study and understand gene codes to learn what types of care and treatment work for each of us, since we all have different responses. According to the National Institutes of Health, this field “takes into account individual variability in genes, environment, and lifestyle for each person. This approach will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people. It is in contrast to a one-size-fits-all approach ... which are developed for the average person.”

During his 2015 State of the Union address, President Barack Obama introduced the Precision Medicine Initiative. He later said, “Doctors have always recognized that every patient is unique, and doctors have always tried to tailor their treatments as best they can to individuals. You can match a blood transfusion to a blood type — that was an important discovery. What if matching a cancer cure to our genetic code was just as easy, just as standard? What if figuring out the right dose of medicine was as simple as taking our temperature?”

The Precision Medicine Initiative is a collaborative research effort involving the NIH and many other research centers. Short term, the effort will focus on cancer research, but in the longer term it aspires to bring precision medicine to all fields of medicine on a population health scale.

As part of the initiative, the NIH has launched the “All of Us Research Program” that seeks to recruit a diverse pool of one million American volunteers to share their health data with the researchers. Data collected will include information about health and lifestyle, genetic data, and biological samples. Over many years, the researchers plan to study the collected data to learn how diseases occur and how disease risk might be

better predicted. Recruiting has been somewhat slower than anticipated with some volunteers expressing concern over the security of their collected data while others may not have understood that consenting meant turning over so much personal data. Researchers remain optimistic, though, that their enthusiasm in scientific inquiry will prevail so they can deliver on the promise of being able to better predict disease onset or treatment of disease with great precision.

FOR MORE INFORMATION

Juan Enriquez: The life code that will reshape the future

www.ted.com/talks/juan_enriquez_on_genomics_and_our_future

Nina Tandon: Could tissue engineering mean personalized medicine

www.ted.com/talks/nina_tandon_could_tissue_engineering_mean_personalized_medicine

All of Us Research Program

allofus.nih.gov/

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