Unique database of cancer -- designed to personalize treatment -- is launched

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Georgetown Lombardi Comprehensive Cancer Center, part of Georgetown University Medical Center, announces the launch of the Georgetown Database of Cancer or G-DOC. Under development for two years, G-DOC is a repository for biological information that is normally only available in scattered information libraries and tissue banks, if at all. Data sets grow as researchers deposit new information. G-DOC also contains relevant tools to analyze the data, plus new ones not seen before.

An overall goal of G-DOC's use is to accelerate the ability to tailor or personalize medical treatment for patients. For physicians and researchers, G-DOC means they need only access a single website portal on their computers to open a unique universe of information on cancer – something that has not been widely available before to oncology researchers who must access a variety of data through different information systems. Researchers at Georgetown will be able to incorporate the G-DOC analytical capabilities immediately into their clinical and laboratory research, as their funding allows. The G-DOC developers hope to open the database for use outside of Georgetown in 2011.

G-DOC is a "one-stop shop" designed to make the vision of personalized medicine a reality, says its creator, Louis M. Weiner, MD, director of Lombardi, which largely funded G-DOC's development. By giving cancer researchers all the information and analytical tools they need, "you can develop a much more complete picture of what causes

individual cancers to develop and to grow, and what new agents are needed to treat them."

G-DOC is one part of the systems medicine paradigm that GUMC has launched. "Systems medicine is an approach that will allow health care providers to understand the interplay between genetics and the environment in such a way that one day, they will be able to predict who is at greatest risk, rather than simply react to symptoms," says Howard J. Federoff, MD, PhD, executive vice president for health sciences at GUMC and executive dean of its School of Medicine, who has championed systems medicine at the University. "It holds promise to enable broad applications on individualized primary prevention."

G-DOC is already being utilized by researchers. As part of a $1 million gift from the Robert M. Fisher Memorial Foundation, information from 200 breast cancer patients treated by Georgetown oncologists has been entered into the G-DOC. The data includes all the "omics" information – molecular analysis of genomics, proteomics, metabolomics, methylomics, transcriptomics from tumors, as well as detailed clinical treatment and outcome information and patient questionnaires about their history, lifestyle, and potential risk factors. The Fisher gift also will be used to conduct a prospective trial of the G-DOC approach in women with early-stage breast cancer.

The goal is to understand the biological conditions that lead to a return of cancer in breast cancer patients who had used tamoxifen, so that predictive markers can predict women who may need alternative treatment. Results are already being analyzed.

So far, the G-DOC contains detailed information on a total of 2,953 breast cancer patients who have consented to participate in research.

Another ongoing pilot project at GUMC collects the same kind of

detailed information on patients who are newly diagnosed with stage II colorectal cancer to determine the biological characteristics of the 20 percent of patients who are not cured by surgery and so who could benefit from more extensive treatment sooner.

While many researchers collect data on their patients, that information is often not shared. Therefore, G-DOC is unique in two major ways, says Weiner. One is the extensive battery of molecular information that will be collaboratively collected and analyzed, and two, the notion that this information will be directed at answering "clinically important questions. We want to define a clinical situation and always connect it back to the patient," he says. "That is the essence of personalized medicine."

Weiner says physicians today are still using 19th and 20th century tools "even though we have 21st century information. Physicians evaluate their patients in much the same way they have for the last 100 years – they take a history, a physical exam, and then use additional exams to make a treatment plan.

"This hasn't changed because there is no effective way to connect clinical and nonclinical information in an efficient way, and we need analytical capabilities that permit us to make sense of the vast amount of information that is now being collected," he says.

"The purpose of G-DOC is to demonstrate that collecting and analyzing molecular and clinical data in tandem will permit use to make more informed decisions about patient management," Weiner says.

The hope is that every cancer patient treated by Lombardi oncologists will agree to have information on their cancer and their treatment history placed in G-DOC, with strict privacy protections, says Subha Madhavan, PhD, director of clinical research informatics – the person who has led the development of G-DOC. The type of data collected and analyzed will

depend on studies that require a powerful integrative and analytic platform like G-DOC, she says. And while some will be privately held within Georgetown prior to publication and broader release, other data will be accessible by the public.

"The goal of systems medicine is to empower the next generation physician to make the best decision for patients based on evidence, and G-DOC is a critical test of that approach," says Madhavan.

Madhavan says systems medicine represents an evolution in health care, integrating science, medicine, informatics, engineering, environment, economics, public policy and more to better understand and care for the human condition. This holistic approach complements GUMC's mission of cura personalis -- or "care of the whole person."

More information: For more information, go to lombardi.georgetown.edu.

Provided by Georgetown University Medical Center