The Cancer Moonshot: Moving From Planning to Research

It is the science being supported by the Moonshot that will accelerate progress across the entire cancer continuum.

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The Cancer Moonshot℠ was announced in 2016 with three overarching goals: accelerate progress in cancer research, encourage greater collaboration, and improve the sharing of data. More than 2 years later, the foundation has been laid for achieving those goals.

A critical component of that foundation was the Moonshot Blue Ribbon Panel, which engaged in a thoughtful and thorough process to develop a comprehensive report that laid out a series of recommendations to get us to those goals. In December 2016, Congress passed the 21st Century Cures Act, which allocated $1.8 billion over 7 years to transition the Moonshot from an ambitious idea to a reality.

NCI rapidly established a systematic process for implementing the report's recommendations. These efforts have resulted in the launching of a series of new scientific programs and the awarding of close to $600 million to research teams across the country. Each of the recommendations of the Blue Ribbon Panel are being addressed through these programs.

As the Moonshot moves forward, I want to provide an update to the cancer community about the science being supported by the Moonshot, because it is the science that will accelerate progress across the entire cancer continuum.

The Science Begins

The Blue Ribbon Panel's recommendations covered 10 areas that the panel of experts, based on their extensive deliberations and feedback solicited from across the cancer community, felt were poised for progress if additional funding could be made available.

NCI staff led the effort to operationalize those recommendations, forming working groups and using a variety of mechanisms to develop funding opportunities aligned with each recommendation. Currently, most of fiscal years' 2017 and 2018 funds have been awarded, and

the next phase of the Moonshot—the research phase—is well underway.

Cancer immunotherapy is one example. Although progress in immunotherapy has been swift in recent years, the panel felt that, with an infusion of funds, even further advancement would be possible.

Under the Moonshot, NCI is funding two groups of research teams: one focused on immunotherapeutic approaches in adults and the other in children. The Immuno-Oncology Translational Network—which includes 31 principal investigators at 19 different institutions—is investigating the mechanisms by which tumors in adults interact with the immune system, developing new immune-based therapies, and creating approaches for minimizing the risk of treatment side effects.

Because most pediatric cancers are biologically quite different from adult cancers, a separate network of research teams has been established that will focus their efforts on identifying immune targets and treatments specific to pediatric cancers and developing laboratory models for testing immunotherapies against these cancers.

Also built into the immunotherapy component of the Moonshot is a data management center, which will allow researchers to share their work easily and facilitate collaboration. This is not unique to the immunotherapy recommendation. Data management centers are being established for other Moonshot-funded research networks as well.

The data management centers for these different networks will interact with each other, sharing data, information, and resources. They are central to public access and data sharing policy established for the Moonshot, which emphasizes the importance of investigators rapidly making available published studies that result from their Moonshot-funded research, including their primary data.

The panel also made recommendations for advancing progress in cancer prevention and early detection. Some of the research being funded in this area will make extensive use of implementation science—taking evidence-based interventions and testing ways to apply them in real-world settings. For example, several research teams will test ways to improve smoking cessation in economically disadvantaged populations where tobacco use remains stubbornly high.

Similarly, the uptake of colorectal cancer screening is low among certain populations, including several racial/ethnic minority groups. A Moonshot-funded initiative is tackling this issue directly, with research teams conducting pilot studies of approaches to improve both screening in underserved populations and the necessary clinical follow-up from that screening.

Supporting a Broad Spectrum of Investigation

The Moonshot is also focused on supporting fundamental research that will further improve our understanding of cancer.

One such example is the Human Tumor Atlas Network (HTAN), a collaborative network that includes investigators at 10 research centers and one data management center. Using a broad range of tools and technologies, these research teams will perform intensive analyses of tumor and tissue samples to construct 3-dimensional maps of human cancers. These maps will capture how cancers change over time—from a precancerous lesion to established tumor to resistant tumor to metastasis—and describe the composition of the types of cells within and around a tumor and the genetic makeup of those cells.

Research teams being funded will focus on highly aggressive pediatric cancers (e.g., neuroblastoma and glioblastoma), on cancer types that disproportionately affect minority and underserved populations (e.g., breast, lung), and on cancers that often have a hereditary component (e.g., colon).

The Blue Ribbon Panel also recognized that accelerating progress against a disease as complicated as cancer requires greater collaboration among researchers and a more efficient research process. One recommendation, for example, was the creation of a network for directly engaging patients. The network's aim will be to make it possible for any patient diagnosed with cancer to have their tumors molecularly profiled and be preregistered for any clinical trials for which they might become eligible.

An essential component of this patient network will be a biobank for storing tumor samples, other tissue specimens, and associated patient data. Special emphasis will be given to include rare tumors. In fact, under the Moonshot, an NCI research team has already launched a pilot project, called NCI-CONNECT, for people diagnosed with rare central nervous system tumors.

Moonshot research teams may be able to take advantage of core services, such as genomic analyses or the formulation of drug candidates for laboratory testing, available through NCI via contracts, including through the Frederick National Laboratory for Cancer Research.

A Foundation for Progress

As co-chair of the Moonshot Blue Ribbon Panel, I'm extremely pleased by what we've been able to accomplish in such a short period, with a process marked by a true spirit of collaboration and collegiality.

NCI leadership is committed to maintaining that collaborative spirit, and to managing the Moonshot in a way that will provide the stability and continuity necessary to allow research to continue at a swift pace and help to achieve the rapid gains envisioned for this effort. We're also committed to keeping the cancer research community fully informed as the Moonshot moves forward.

With these new research initiatives, the Moonshot is already well on its way to achieving its goals and having a lasting impact on cancer research.

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