

UT MD Anderson Cancer Center launches unprecedented Moon Shots Program

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This is a Moon Shots image. Credit: MD Anderson

The University of Texas MD Anderson Cancer Center announces the launch of the Moon Shots Program, an unprecedented effort to dramatically accelerate the pace of converting scientific discoveries into clinical advances that reduce cancer deaths.

Even as the number of [cancer survivors](#) in the US is expected to reach an estimated 11.3 million by 2015, according to the [American Cancer Society](#), [cancer](#) remains one of the most destructive and vexing diseases. An estimated 100 million people worldwide are expected to lose their lives to cancer in this decade alone. The disease's devastation to humanity now exceeds that of cardiovascular disease, tuberculosis, HIV and malaria - combined.

The Moon Shots Program is built upon a "disruptive paradigm" that brings together the best attributes of both academia and industry by creating cross-functional professional teams working in a goal-oriented, milestone-driven manner to convert knowledge into tests, devices, drugs and policies that can benefit patients as quickly as possible.

The Moon Shots Program takes its inspiration from President John Kennedy's famous 1962 speech, made 50 years ago this month at Rice University, just a mile from the main MD Anderson campus. "We choose to go to the moon in this decade ... because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win," Kennedy said.

"Generations later, the Moon Shots Program signals our confidence that the path to curing cancer is in clearer sight than at any other time in history," said Ronald A. DePinho, M.D., MD Anderson's president. "Humanity urgently needs bold action to defeat cancer. I believe that we have many of the tools we need to pick the fight of the 21st century. Let's focus our energies on approaching cancer comprehensively and systematically, with the precision of an engineer, always asking ... 'What can we do to directly impact patients?'"

The inaugural moon shots

The program, initially targeting eight cancers, will bring together sizable multidisciplinary groups of MD Anderson researchers and clinicians to mount comprehensive attacks on:

- acute myeloid leukemia/myelodysplastic syndrome;
- chronic lymphocytic leukemia;
- melanoma;
- lung cancer;

- prostate cancer, and
- triple-negative breast and ovarian cancers - two cancers linked at the molecular level.

Six moon shot teams, representing these eight cancers, were selected based on rigorous criteria that assess not only the current state of scientific knowledge of the disease across the entire cancer care continuum from prevention to survivorship, but also the strength and breadth of the assembled teams and the potential for near-term measurable success in terms of cancer mortality.

Each moon shot will receive an infusion of funds and other resources needed to work on ambitious and innovative projects prioritized for patient impact, ranging from basic and translational research to biomarker-driven novel clinical trials, to behavioral interventions and public policy initiatives.

The platforms make the program unique

The institution-wide, high quality scientific and technical platforms will provide key infrastructure for the success of the Moon Shots Program. In the past, each investigator or group of investigators has developed their own infrastructure to support their research programs. Frequently they were under-funded and lacked the high level management and leadership required to ensure that they were of the highest caliber and in particular that they were able to adapt to the rapidly changing scientific and technological environment. The moon shot platforms will be designed and resourced to provide expertise that will support the efforts of all of moon shots teams. The platforms will provide a critical component to the success of each moon shot and of the overall Moon Shots Program. In particular, they will leverage the investment across the moon shots.

These platforms include:

- **Adaptive Learning in Genomic Medicine:** A work flow that enables clinicians and researchers to integrate real-time patient clinical information and research genomic data, allowing understanding of the cancer genome and ultimately improving outcome.
- **Big Data:** The capture, storage and processing of huge amounts of information, much of it coming from Next Generation Sequencing machines (genome sequencing).
- **Cancer Control and Prevention:** Community-based efforts in cancer prevention, screening, and early detection and survivorship to educate and achieve a measureable reduction in the cancer burden. Interventions in the areas of public policy, public education, professional education and evidence-based service delivery can make a measurable and lasting difference in our community, especially among those most vulnerable - the underserved.
- **Center for Co-Clinical Trials:** Uses mouse or cell models of human cancers to test new drugs or drug combinations and discover the subset of patients most likely to respond to the therapy.
- **Clinical Genomics:** An infrastructure designed to bank and process tumor specimens for clinical tests that can guide medical decisions.
- **Diagnostics Development:** The development of diagnostic tests for use in the clinic to guide targeted therapy.
- **Early Detection:** Using imaging and proteomic technologies to discover markers that can identify patients with early-staged cancers.
- **Institute for Applied Cancer Science:** Developing effective targeted cancer drugs.

- **Institute for Personalized Cancer Therapy:** An extensive infrastructure that analyzes genomic abnormalities in patient tumors to direct them to the best treatments and clinical trials.
- **Massive Data Analytics:** A computer infrastructure that develops or uses computational algorithms to analyze large-scale patient and public data.
- **Patient Omics:** Centralizing collection of patient biospecimens (tumor samples, blood, etc.) to profile genes and proteins (genomics, proteomics) and identify mutations that can guide personalized treatment decisions and predict therapy-related toxicity to improve overall patient outcomes.
- **Translational Research Continuum:** A framework to facilitate efficient transition of a candidate drug from preclinical studies to early stages of human clinical trial testing so effective drugs can be developed in a shorter time and clinical trials can be quicker and cheaper with higher success rates.

MD Anderson's "Giant leap for mankind"

A year ago, when DePinho was named MD Anderson's fourth president, he proposed the notion of a moon shot moment. "How can we envision what's possible to reduce cancer mortality if we think boldly, adopt a more goal-oriented mentality, ignore the usual strictures on resources that encumber academic research and use the breakthrough technology available today?" he asked.

Response from the faculty and staff took the form of initial moon shot proposals that targeted several major cancer types and involved large, integrated MD Anderson teams, sometimes numbering in the hundreds.

Frank McCormick, Ph.D., director of the University of California, San Francisco Cancer Center and president of the American Association for Cancer Research, led the review panel of 25 internal and external

experts that narrowed the field to the inaugural six moon shots.

"Nothing on the magnitude of the Moon Shots Program has been attempted by a single academic medical institution," McCormick said. "Moon shots take MD Anderson's deep bench of multidisciplinary research and patient care resources and offer a collective vision on moving cancer research forward."

McCormick added, "The process of bringing this amount of horsepower together in such a focused manner is not normally seen in academic medicine and is valuable in and of itself."

Most ambitious program MD Anderson has ever mounted

The Moon Shots Program is among the most formidable endeavors mounted to date by MD Anderson, an institution ranked the No. 1 hospital for cancer care by US News & World Report's Best Hospitals survey for nine of the past 11 years, including 2012. As the program unfolds and grows, it will be woven into all areas of the institution. Researchers and clinicians concentrating on any cancer - not just the first set of moon shots - will link to new technological capabilities, data and clinical strategies afforded by the platforms.

In the first 10 years, the cost of the Moon Shots Program may reach an estimated \$3 billion. Those funds will come from institutional earnings, philanthropy, competitive research grants and commercialization of new discoveries. They will not interrupt MD Anderson's vast research program in all cancers, with a budget of approximately \$700 million annually. In fact, the program's efforts will help support all other cancer research at MD Anderson, particularly with improved resources and infrastructure, as the ultimate goal is to apply knowledge gained from

this process to all cancers.

Implementation of the program will begin in February 2013, and is expected to reach full stride by mid-2013.

"The Moon Shots Program holds the potential for a new approach to research that eventually can be applied to all cancers and even to other chronic diseases," DePinho said. "History has taught us that if we put our minds to a task, the human spirit will prevail. We must do this - humanity is depending on all of us."

More information: www.cancermoonshots.org/

Provided by University of Texas M. D. Anderson Cancer Center

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