



**THE UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER**  
**MOON SHOTS PROGRAM**

*An unprecedented effort setting new bars for eradicating cancer; goal to significantly increase patient survival during the next decade*

**INTRODUCTION**

Even as the number of survivors in the U.S. is expected to grow to 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 University of Texas MD Anderson Cancer Center's Moon Shots Program is a "giant leap for mankind," an unprecedented effort to dramatically accelerate the pace of converting scientific discoveries into clinical advances that reduce cancer deaths.

The Moon Shots Program is built upon a game-changing 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 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.

**THE 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 and myelodysplastic syndrome
- chronic lymphocytic leukemia;
- melanoma;
- lung cancer;
- prostate cancer, and
- women's cancers – triple-negative breast and ovarian cancers, two cancers linked at the molecular level.

Six moon shot teams, representing the eight cancers, were selected based on three rigorous criteria: the current state of scientific knowledge across the cancer continuum from prevention to survivorship; the strength and breadth of the assembled team; and the potential for near-term measurable success in reducing cancer deaths.

Research projects will be prioritized for patient impact, ranging from basic research and biomarker-driven clinical trials to behavioral interventions and public policy initiatives.

## THE PLATFORMS

Institutionwide, 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 its own infrastructure to support its research programs. Frequently they were underfunded and lacked the high-level management and leadership required to ensure that they were of the highest caliber and could adapt to the rapidly changing scientific and technological environment. The platforms will be designed and resourced to provide expertise that will support the efforts of all moon shot teams. The platforms will provide a critical component to the success of each moon shot and of the overall program. 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.

## AMONG MD ANDERSON'S MOST AMBITIOUS PROGRAMS

The Moon Shots Program is among the most formidable endeavors mounted 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 program may reach an estimated \$3 billion. Those funds will come almost equally from philanthropy, competitive research grants, commercialization of new discoveries and institutional revenues. They will not interrupt MD Anderson's vast research program in all cancers, with a budget of approximately \$700 million annually. In fact, efforts in the program 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 should reach full stride by mid-2013. For more information, including backgrounders on the inaugural moon shots, please visit [www.cancermoonshots.org](http://www.cancermoonshots.org).