

# LUNG CANCER MOON SHOT

## INTRODUCTION

Lung cancer remains the most common cancer and by far the largest cause of cancer-related deaths. The National Cancer Institute estimates that 160,340 people will die in 2012 of the disease, more than all deaths combined from the next three most frequent cancers: colorectal, breast and prostate. An estimated 226,000 new cases will be diagnosed this year.

- Prevention works. The most successful intervention has been the decades-long effort to discourage tobacco use and help people stop smoking. These efforts, a 2012 study found, prevented 795,000 deaths between 1975 and 2000. The U.S. Centers for Disease Control and Prevention estimates 43 million Americans smoke.
- Treating lung cancer early helps. About 16% of lung cancer patients survive for five years. Of those whose cancer is detected at an early stage, 49% live at least that long, while only 2% of those with metastatic disease at diagnosis survive for five years.
- Early detection remains difficult. For years, there had been no reliable method to catch lung cancer at more treatable stages. A major study published in 2011, however, showed that low-dose spiral CT scans spot lung cancer early enough in past or present heavy smokers to increase survival. But challenges remain to fully deploy such screening.
- Treatment options are limited. Beyond surgery and radiation, lung cancer therapy is the domain of general chemotherapies and combinations that unpredictably help a fraction of patients. Recent advances in targeted therapy led to two drugs that hit specific molecular targets in tumors, but they apply to about 18% of patients.

## KEY PROJECTS

MD Anderson's lung cancer moon shot will accelerate these gains and discover new ways to improve survival with a massive mobilization of institutional expertise in lung cancer risk assessment, smoking prevention and cessation, spiral CT screening, development of targeted therapies and the molecular profiling of tumors necessary for a more individualized approach.

By blending this critical mass with new capabilities and resources available through the Moon Shots Program, the lung cancer moon shot will increase prevention, improve treatment and survival, and match all actionable mutations in lung cancer to appropriate drugs.

The lung cancer moon shot has three major initiatives.

- Integrated Smoking Prevention, Risk and Early Detection (INSPIRED) initiative. INSPIRED will include proven programs in tobacco prevention outreach to youth and smoking cessation developed in the Division of Cancer Prevention and Population Sciences. Molecular and clinical risk assessment models will help identify past and present smokers most appropriate for spiral CT screening.

### MOON SHOT GOALS

- Reduce tobacco use rates among youth and young adults by 15%.
- Cut false positive rates in spiral CT screening by more than 20 percent.
- Increase cure rates for early stage and locally advanced lung cancer by 20% in three years
- Identify every targetable mutation and match them to a drug to help those with metastatic disease.

- BATTLE Therapeutics Program takes MD Anderson’s approach of matching cancer drugs to specific mutations in tumors developed in its BATTLE clinical trial for late-stage lung cancer and extends it to early stage and locally advanced lung cancer.
- Target and Drug Discovery Program will collaborate with MD Anderson’s Institute for Applied Cancer Science to establish preclinical and drug-screening platforms that will identify molecular targets and develop drugs to hit them. This will include screening of existing FDA-approved drugs for other diseases during the moon shot’s early years.

### **THE AIM**

The lung cancer moon shot, in its first five years, plans to create new, integrated methods to prevent, detect and treat lung cancer using existing technologies and therapies by launching INSPIRED, extending BATTLE platforms and creating the Target and Drug Discovery pipeline.

In years five to 10, the team will change the standard of care worldwide by comparing new approaches from the INSPIRED and BATTLE platforms against standard therapies. It also will deliver new targeted therapies for patients from the drug discovery pipeline.

### **THE LUNG CANCER MOON SHOT TEAM**

This moon shot gathers a diverse team of experts from across the institution, including leaders in oncology, surgery, radiation oncology, behavioral sciences, diagnostic imaging, basic science, biostatistics, pathology, epidemiology, translational research and bioinformatics.

#### *Moon shot leaders*



**John Heymach, M.D., Ph.D.** – Chief of Thoracic Medical Oncology and an associate professor in MD Anderson’s Department of Thoracic/Head and Neck Medical Oncology, an accomplished clinical investigator, is co-leader of the BATTLE frontline clinical trial. He is a leader in developing predictive biomarkers for angiogenesis inhibitors and understanding mechanisms of therapeutic resistance through basic and translational research.



**Stephen Swisher, M.D.**, – Professor and chair of MD Anderson’s Department of Thoracic and Cardiovascular Surgery, is an internationally recognized expert on translational research – the advancement of candidate drugs to clinical trial. He research interests focus on development of novel gene therapy strategies to treat lung and esophageal cancer patients.