THE MELANOMA MOON SHOT

Stopping the sun to get to the moon

INTRODUCTION

Melanoma is a highly aggressive disease with a sharply rising incidence and mortality rate. Though it accounts for less than five percent of skin cancer cases, melanoma causes more than 75% of skin cancer deaths and is the leading cause of cancer-related death in young women. However, melanoma is potentially preventable, and the treatment of advanced disease is in the midst of a revolution due to rapidly improving understanding of the molecular drivers of the disease. Now, more than ever before, there exists an opportunity to convert momentum into significant reductions in incidence and mortality.

- The majority of melanomas are directly tied to ultraviolet radiation (UVR); one or more blistering sunburns in childhood or adolescence more than double a person's chances of developing melanoma later in life. And yet, adolescents continue to use tanning salons, and pervasive messages that sun and tanning are fun and healthy endure.
- The vast majority of newly diagnosed melanoma patients have early-stage disease. Although treatable and often curable at this early juncture, approximately 15-20% of these patients develop melanoma metastasis within 10 years. Better prognostic modeling that leverages our rapidly evolving understanding of the clinical, pathological and molecular factors that shape risk could reduce deaths, avoid unnecessary treatment and reduce economic cost by personalizing the clinical management of this large patient group.
- Although recent advances in targeted and immune therapies for advanced melanomas are transformative for a subset of melanoma patients, durable response remains elusive for the majority. Moreover, a significant proportion of melanoma patients remain without rational, personalized treatment options.

KEY PROJECTS

The melanoma moon shot aims to reduce overall incidence of melanoma; improve early detection; better treat early stage melanomas; and develop effective treatments customized to each patient with advanced disease. Our effort will span the entire cancer care continuum from prevention to treatment:

- We will reduce the incidence of melanoma, and increase the proportion of patients diagnosed with early-stage (potentially curable) disease through efforts in primary prevention (i.e., behavior modification and legislative initiatives), chemoprevention, development of novel screening techniques, and improved risk modeling.
- We will personalize management strategies in clinically localized disease to save lives, improve quality of life and maximize the efficient use of health care resources. This effort will include the integration of new molecular markers with validated clinical and pathological factors; and the development of individualized, context-specific, risk-driven treatment approaches.
- We will exploit molecular insights to develop effective new therapies, prevent and overcome resistance, to improve long-term disease control and survival in advanced melanoma through personalized combinatorial approaches.

MOON SHOT GOALS

- Reduce incidence of melanoma through primary and secondary prevention efforts.
- Increase the rate of long-term disease control and survival in patients with stage IV disease
- Develop new markers that improve risk assessment and facilitate personalized treatment strategies

- We will perform broad, cutting-edge molecular profiling of patients and develop standardized diagnostic tests that will facilitate personalized care across the entire continuum of melanoma.

THE AIM

The melanoma moon shot builds on recent extraordinary progress against melanoma by more efficiently deploying existing knowledge and technology in the near term and by discovering and developing new approaches in the longer term.

THE MELANOMA MOON SHOT TEAM

MD Anderson melanoma center is among the largest worldwide. More than 60 faculty members from approximately 20 MD Anderson departments collaborated on the project. The team has an active biomarker discovery program, clinical trials to improve patient care, and comprehensive patient databases with clinical data and annotated tumor samples. The team:

- Represents diverse disciplines including surgical, medical, radiation,and pediatric oncologists; pathologists; epidemiologists; behavioral scientists; health policy experts; molecular biologists; biostatisticians and bioinformaticians; immunologists, among others.
- Provides recognized leadership of national and international collaborations, including the NIH-funded Melanoma Cancer Genome Atlas Program (TCGA), a project cataloguing genetic mutations responsible for melanoma and co-led by MD Anderson faculty.
- Will partner within, across and beyond MD Anderson – such as with the Melanoma Research Foundation and its Breakthrough Consortium, the Melanoma Research Alliance, and AIM at Melanoma, among others – to leverage discoveries and promote wide-scale adoption of best prevention and treatment practices.

The Moon Shots Program adds access to important new infrastructure – including research platforms that will amplify present capabilities, provide new resources and accelerate progress – and a transformative vision to promote team science.

The moon shot leaders

Jeffrey E. Gershenwald, M.D. – is a professor in the Departments of Surgical Oncology and Cancer Biology, as well as medical director of the Melanoma and Skin Center. A surgeon-scientist, his research focuses on clinicopathological and molecular-based staging and prognostic assessment in melanoma, and molecular mechanisms of melanoma progression. He is a co-chair of the NIH-funded melanoma TCGA effort, and co-director of the NIH-funded Melanoma SPORE and of the Melanoma Informatics, Tissue Resource and Pathology Core, both at MD Anderson.

Michael A. Davies, M.D., Ph.D – is an assistant professor, Department of Melanoma Medical Oncology and the Department of Systems Biology. His research focuses on regulation and functional role of protein kinase signaling pathways in melanoma; identifying predictors of sensitivity and resistance to therapeutic agents; and changes in protein and gene expression induced by different therapies to identify mechanisms of resistance and develop more effective treatment approaches.

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