A MESSAGE FROM THE AACR

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In the United States, federal government investments in the National Institutes of Health (NIH) and the National Cancer Institute (NCI) fuel much of the progress against cancer. Additionally, federal funding of the U.S. Food and Drug Administration (FDA) will help speed the delivery of safe and effective treatments, such as anticancer therapeutics, to the patients who need them.

The annual AACR Cancer Progress Report to Congress and the American public is a cornerstone of the efforts of the American Association for Cancer Research (AACR) to educate the public about cancer and the importance of biomedical and cancer research to public health, as well as to advocate for increased federal funding for the NIH, NCI, and FDA. The AACR Cancer Progress Report 2015, which is the fifth edition of the report, chronicles how federally funded research is transforming lives and shows that our ability to fully capitalize on our ever-growing knowledge of cancer is at risk because federal investments in the NIH and NCI have stagnated.

Therefore, the AACR urges all Americans to join us in calling on Congress and the administration to prioritize the growth of the NIH, NCI, and FDA budgets through annual funding increases that are robust, sustainable, and predictable. This is vital if we are to continue to make progress for the benefit of families everywhere.

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CANCER IN 2015

Progress Against Cancer: Powered by Research

Research improves survival and quality of life for millions of individuals around the world by catalyzing the development and implementation of new and better ways to prevent, detect, diagnose, treat, and cure some of the many diseases we call cancer. As a result, overall U.S. cancer death rates are decreasing and the number of people who survive their cancer is increasing.

The research that is powering progress is made possible by investments from governments, philanthropic individuals and organizations, and the private sector the world over. In the United States, federal investments in biomedical and cancer research, administered through the NIH and NCI, respectively, are paramount.

Cancer: An Ongoing Challenge

Even though there has been tremendous progress against cancer, this collection of diseases continues to exert a devastating toll on the global population. In fact, it is predicted that about 8.9 million people worldwide will die from some form of cancer in 2015, with 589,430 of these individuals living in the United States.

The number of new U.S. cancer cases is predicted to rise: 1.7 million in 2015 to 2.4 million in 2035.

Almost 70 percent of U.S. cancer cases are diagnosed in people age 55 and older.

Cancer is the No. 1 cause of disease-related death among U.S. children.

Cancer: A Costly Disease. Research: A Vital Investment

The immense burden of cancer in the United States and around the world is measured not only in the number of lives it touches but also in its significant economic impact.

Given the increasing economic and personal burden of cancer, it is clear that more research is required if we are to develop new cancer prevention and treatment approaches. Thus, here in the United States, it is imperative that Congress and the administration increase investments in the federal agencies that are vital for fueling progress against cancer, in particular the NIH, NCI, and FDA.

DEVELOPING CANCER

Cancer is not one disease, it is a collection of many diseases that arise when the processes that control the multiplication and lifespan of normal cells go awry. When this happens, the cells start multiplying uncontrollably, fail to die when they should, and begin to accumulate. In body organs and tissues, these cancerous cells form a tumor mass, and in the blood or bone marrow, they crowd out the normal cells.

Among the reasons that cancer continues to be an enormous public health challenge is that advances have not been uniform for all types of cancer or for all patients diagnosed with a given type of cancer. Moreover, because most cancer diagnoses occur in those age 65 and older, a growing segment of the U.S. population, we face a future in which the number of cancer-related deaths will increase dramatically unless new and better ways to prevent, detect, diagnose, and treat cancer can be developed.
Changes, or mutations, in the genetic material of normal cells are the primary cause of cancer. Individuals sometimes inherit a mutation but most are acquired over time. The identity, order, and speed at which a cell acquires genetic mutations determine the length of time it takes a cancer to develop and are influenced by numerous interrelated factors, including the person's genetic makeup and exposure of the cell to environmental factors like chemicals in tobacco smoke and ultraviolet light from the sun.

Although genetic mutations underpin cancer initiation and development in most cases, epigenetic abnormalities, as well as interactions between cancer cells and their environment—known as the tumor microenvironment—and interactions with systemic factors, also play an important role in cancer development.

Research has expanded our understanding of the processes by which cancer starts, progresses, and results in disease, as well as increased our ability to exploit this knowledge to develop new and better approaches to cancer prevention, detection, diagnosis, and treatment. Most of the new approaches to cancer treatment are more precise than traditional therapies, providing patients with not just longer, but also higher quality lives, and researchers are beginning to use the same precision strategy to develop new cancer prevention and interception interventions.

In 2011, the AACR commemorated the 40th anniversary of the signing of the National Cancer Act of 1971 with the publication of the inaugural AACR Cancer Progress Report, which highlighted the amazing advances in cancer research made between 1971 and 2011. Incredibly, many advances have been made since the start of 2011. As research has powered a deeper understanding of the inner workings of cancer, we have made increasingly more precise therapeutics, which have reduced adverse effects compared with traditional treatments. Moreover, the pace of progress during the five years of publishing the AACR Cancer Progress Report was greater than at any other time in the history of the AACR. For example, during that period, 32 new therapeutics targeting molecules involved in the development and progression of cancer were discovered and approved for patient benefit, which is more than in the four decades prior.
If we are to prevent cancer from developing, we must understand what causes it. Given that we know that most cancers arise as a result of acquired genetic mutations, we must understand what causes these genetic mutations to occur.

Decades of research have led to the identification of many factors that can cause genetic mutations and, therefore, increase a person’s risk of developing cancer. Because exposure to many of these factors can be eliminated or reduced, it is estimated that more than 50 percent of the 589,430 U.S. cancer deaths expected to occur in 2015 will be related to preventable causes.

Many factors that increase the risk of developing cancer are related to lifestyle. Thus, a person can eliminate or reduce his or her risk of developing certain types of cancer by modifying his or her behavior.

Effective public education and policy initiatives help create environments that allow individuals to more easily reduce their risk of developing cancer. However, more research and more resources are needed to understand why some individuals are refractory to public education and policy initiatives and how best to help these individuals eliminate or reduce their risk of developing some cancers.

Unfortunately, not all cancer risk factors can be avoided and not everyone avoids those factors that are avoidable. This highlights the need for cancer screening, which can identify a precancer or cancer early in development, when it can be more easily and successfully intercepted. However, everyone has their own unique risks for developing each type of cancer. As a result, every individual should consult his or her health care practitioners to develop a cancer prevention and early detection plan tailored to their personal cancer risks.

These plans are the first step toward an era of precision prevention and interception in which we will develop and implement new cancer prevention and early detection strategies that pair our increased molecular understanding of cancer development with knowledge of an individual’s unique cancer risk profile.

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Cancer Prevention, Detection, Interception, and Diagnosis

Cancer prevention, early detection, and interception are the most effective ways to reduce the burden of cancer. Two FDA approvals that occurred in the 12 months ending July 31, 2015, will help in this regard.

Treatment With Surgery, Radiotherapy, and Traditional Chemotherapy

The increasing number of molecularly targeted therapeutics that form the basis of the precision medicine revolution are transforming the standard of cancer care from a one-size-fits-all approach to one in which greater understanding of the patient and his or her tumor dictates the best therapeutic strategy. But not all patients with cancer can be treated with molecularly targeted therapeutics. As a result, surgery, radiotherapy, and traditional chemotherapy are the best treatment options for many patients with cancer.

Unfortunately, radiotherapy and traditional chemotherapy often have long-term adverse effects on patients.

Thus, researchers are looking to pair our increasing understanding of cancer biology with knowledge of the traits of each patient's own cancer to increase the precision with which radiotherapy and traditional chemotherapy are used so as to tailor each patient's treatment to be only as aggressive as is needed for it to be effective.

Treatment With Molecularly Targeted Therapeutics

Research is powering the field of precision medicine in many ways, including by increasing our understanding of the molecules involved in cancer initiation and development. Therapeutics directed to these molecules are the mainstay of precision medicine. In the 12 months from Aug. 1, 2014, to July 31, 2015, the FDA approved four new molecularly targeted therapeutics and new uses for four previously approved molecularly targeted therapeutics.

Because molecularly targeted therapeutics more precisely target cancer than traditional chemotherapeutics, they tend to be more effective and less toxic. As a result, these agents are transforming the lives of countless cancer patients, including Janet Klein, who has metastatic estrogen receptor–positive breast cancer.
The way in which different immunotherapeutics work to benefit patients varies. Some immunotherapeutics release the brakes on immune cells that have natural potential to eliminate cancer cells. Included among these agents is nivolumab (Opdivo), which has been doing for Donna Fernandez what chemotherapy could not: keeping her stage IV nonsquamous non–small cell lung cancer at bay.

Living With or Beyond Cancer

More people are surviving longer and leading fuller lives after a cancer diagnosis than ever before. In 1971, there were just 3 million U.S. cancer survivors compared with almost 14.5 million at last count, on Jan. 1, 2014. Among these 14.5 million people were almost 380,000 individuals who, like Jay Steiner, received their cancer diagnosis as a child or adolescent.

Cancer survivorship can be challenging. However, the challenges faced by each survivor are unique and depend on many factors, including gender, age at diagnosis, type of cancer diagnosed, general health at diagnosis, and type of treatment received.

It is not just cancer survivors who are affected after a cancer diagnosis but also their caregivers. A recent study suggests that incorporating caregiver care into survivorship programs may improve outcomes and quality of life for cancer survivors.

Other immunotherapeutics, such as dinutuximab (Unituxin), which has benefited many children with neuroblastoma, like Elizabeth Buell-Fleming, work by helping cancer-fighting immune cells find cancer cells.

WHAT PROGRESS AND PROMISE DOES THE FUTURE HOLD?

Even though precision medicine has been transforming the lives of an increasing number of patients with cancer, particularly during the past five years, it is estimated that more than 1.65 million U.S. residents will receive a cancer diagnosis and more than 589,000 will die from the disease in 2015 alone.

Many researchers, however, including AACR President (2015–2016) José Baselga, MD, PhD, think that the best is yet to come, and that the explosion of new knowledge about cancer and the exciting technological advances, along with our ever-increasing understanding of how to apply them, will further revolutionize cancer care.

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... these are exciting times and ... the pace of discovery and application of new knowledge to patient care is rapidly accelerating.
THE AACR CALL TO ACTION

The AACR respectfully urges Congress and the administration to:

• Implement a strategy for robust, sustained, and predictable growth in funding for the NIH and NCI by providing annual budget increases of at least 7 percent. This level of funding would represent strong growth in excess of the biomedical inflation rate, resulting in fiscal year (FY) 2020 funding levels for the NIH and NCI of $42.5 billion and $7 billion, respectively.

• Increase the FDA budget in FY 2016 by $200 million above its FY 2015 level (a 7 percent increase from $2.6 billion to $2.8 billion) and ensure that the agency receives comparable annual percentage increases thereafter.

Achieving these goals will require Congress to work in a bipartisan fashion to enact a broad-based budget deal that raises the discretionary funding caps for FY 2016 and beyond. This would allow our nation’s policymakers to invest in priority areas, such as biomedical research, cancer research, and regulatory science, which will speed product innovations that are safe and effective and advance public health.

By committing to provide the NIH, NCI, and FDA with annual funding increases that are robust, sustained, and predictable, we will transform cancer care, spur innovation and economic growth, maintain our position as the global leader in science and biomedical research, and, most importantly, bring hope to cancer patients and their loved ones.

Founded in 1907, the American Association for Cancer Research (AACR) is the world’s oldest and largest professional organization dedicated to advancing cancer research and its mission to prevent and cure cancer. AACR membership includes more than 35,000 laboratory, translational, and clinical researchers; population scientists; other health care professionals; and cancer advocates residing in 101 countries. The AACR marshals the full spectrum of expertise of the cancer community to accelerate progress in the prevention, biology, diagnosis, and treatment of cancer by annually convening more than 25 conferences and educational workshops, the largest of which is the AACR Annual Meeting with nearly 19,300 attendees. In addition, the AACR publishes eight prestigious, peer-reviewed scientific journals and a magazine for cancer survivors, patients, and their caregivers. The AACR funds meritorious research directly as well as in cooperation with numerous cancer organizations. As the Scientific Partner of Stand Up To Cancer, the AACR provides expert peer review, grants administration, and scientific oversight of team science and individual investigator grants in cancer research that have the potential for near-term patient benefit. The AACR actively communicates with legislators and other policymakers about the value of cancer research and related biomedical science in saving lives from cancer.

For your FREE copy of the full report, go to www.CancerProgressReport.org