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MEDICAL SCHOOL**

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Good morning Mr. Chairman and Members of the Subcommittee. My name is Dr. Robert DiPaola, and I am the Director of The Cancer Institute of New Jersey (CINJ), our State's only National Cancer Institute (NCI)-designated Comprehensive Cancer Center at UMDNJ-Robert Wood Johnson Medical School. The mission of CINJ, similar to the 65 other NCI-designated Centers Nationwide, is to reduce cancer incidence, morbidity, and mortality through multi-disciplinary cancer research. I am also a member of the American Association for Cancer Research (AACR). The mission of AACR, as the world's oldest professional organization dedicated to advancing cancer research, is to prevent and cure cancer through research, education, communication, and collaboration.

Thank you for convening this hearing and recognizing that cancer research is critical to making and translating the discoveries needed to reduce the toll that cancer takes directly on the people and the economy of our Nation. Through its oversight and legislative activities, this Committee has played an important role in advancing cancer research at the national and local levels and I commend Chairman Pallone and all of the Members of the Committee for their achievements and ongoing commitment to this national priority.

Today, we estimate that one in two men and one in three women will develop cancer in their lifetimes. This year alone almost 1.5 million Americans will be diagnosed with cancer and more than half a million Americans are expected to die of the disease - that's approximately 1,500 people a day, and one per minute. In fact, in the United States, cancer accounts for nearly one of every four deaths (American Cancer Society, *Cancer Facts and Figures 2009*). The toll on the

economy is also staggering and predicted to increase if there is not dramatic intervention, supporting the need to increase investment in cancer research. Compounding these concerns is the increased risk of cancer to our aging “baby boomer” population, confirming our need to increase the investment in preventive and therapeutic research, which has the promise to decrease health care spending by effectively treating and preventing cancer before the disease becomes advanced and more costly.

Successes and Challenges

The Nation’s investment in cancer research is reaping substantial benefits for millions of Americans. According to the American Cancer Society (ACS) (ACS, *Surveillance and Health Policy Research*, 2009), the five-year survival rate for cancer has improved. In a comparison of the time period 1996 to 2004 with the period 1975 to 1977, the overall five-year survival rate has improved from 50% to 66%. Accordingly, the five-year estimated survival rate for many of the most common types of cancer have improved in the same time frame: breast 75% to 89%, prostate 69% to 99%, and colon 52% to 65%. Some less common cancers have also improved, but remain at low rates of five-year survival. For example, Pancreas cancer has a 5% five-year survival compared to 3% in the past and liver cancer 11% versus 4% in the past, according to the *ACS Cancer Facts and Figures 2009*. Therefore, despite substantial improvements, we need to go further, and we now have additional technology to move research forward at a faster pace. A major advance that is providing for accelerated progress is the sequencing of the human genome, which now is allowing us to answer difficult questions more rapidly. According to the NCI FY2011 annual plan and budget report, “what once took tens of millions of dollars and years to accomplish can now be done in about a week for \$10,000 or less, thanks to next-generation sequencing technology.” To capitalize on the remarkable scientific and technical advances, however, we need to continue to invest. We need to reinforce our army of researchers who have already accelerated our ability to translate discoveries into results for patients, through research in **diagnosis, treatment and prevention** of cancer.

Research to improve **diagnosis** of cancer at an earlier stage of disease improves our opportunity to have an impact on healthcare. It has been long known that the chance for a patient to be cured when diagnosed in early stages of cancer is far greater than the rate of cure for patients

diagnosed with more advanced stages of disease. Building on recent research discoveries identifying biomarkers of early disease, the opportunity to translate to effective new means of diagnosis is better than ever before. A major challenge, however, is limited funding for the clinical trials necessary to validate these approaches. Another challenge is the integration of many disciplines, including basic laboratory research, clinical research, and efforts in information technology to align specific genetic and molecular findings with clinical outcomes to accelerate high impact discoveries. Therefore, it will be important to increase efforts in fundamental basic research to continue to discover genetic and molecular abnormalities, efforts in translational research to move those discoveries to patients, efforts in collaborative research to combine many institutions to complete large clinical studies, and the integration of information technology to catalyze research efforts by providing needed data for researchers.

In regard to **treatment**, we are beginning to more effectively translate scientific discoveries directly to new drugs for patients. There are a panoply of new anti-cancer drugs being studied in clinical trials, but very few will be approved without efforts to optimize our approach. In fact, approximately 5-10% of drugs that are first tested in cancer clinical trials are ultimately approved by the US Food and Drug Administration. We now have new models to improve this success rate, all of which can be enhanced with increased research funding. First, we have improved the success of drug development by better understanding molecular pathways that allow drug developers to take a more targeted approach. This has led to the success of the drug imatinib, which has revolutionized the treatment of chronic myeloid leukemia by targeting and inhibiting a specific molecular pathway responsible for this cancer. Second, we have improved the assessment of drug concentrations in the blood and the effect on cancer cells in clinical trials through better measurements, imaging, and new clinical trial designs. Third, we are improving the ability to individualize therapies, thereby improving results for patients, through molecular characterization of cancer cells. Fourth, we now have an improved our understanding of not only what makes a cancer cell grow and spread, but how a cancer cell survives drugs, radiation, and other stresses, and how to use this information to improve the effectiveness of our therapies.

Efforts to reduce the toll of cancer on the people of our Nation could be maximized by a greater investment in **prevention**. Efforts to develop preventive agents have been successful, including

the approval of agents for prevention of breast cancer and vaccination to prevent liver and cervical cancer, with high impact by reducing cancer and the associated economic challenges. With continued support, further impact is possible with therapeutic research possibilities, increased efforts in behavioral research to identify methods to change lifestyles, and the potential for better identification of high-risk populations through advances in genomic technology for a more personalized approach.

The Importance of Collaboration and NCI-Designated Cancer Centers

Much of the progress made in this country against cancer has been the result of research and cancer care done at NCI-designated Cancer Centers, of which 65 today are scattered throughout the United States. The NCI-designated Cancer Centers like the Cancer Institute of New Jersey (CINJ) are a major force in discovering the cures for cancer, and of development of more effective approaches to prevention, diagnosis, and therapy. NCI-designated Cancer Centers deliver medical advances to patients, educate healthcare professionals and the public, reach out to underserved populations, and collaborate with colleagues in academia and industry to bring the latest medicines directly to patients. As noted in the NCI FY2011 annual plan and budget report, “Cancer Centers are key participants-the linchpin, some might say-across virtually every NCI initiative.”

A culture of collaboration is also a hallmark of NCI-designated Cancer Centers, as well as many NIH-supported grants that require multidisciplinary, multi-investigator, and consortium efforts. Collaboration with pharmaceutical and biotechnology companies also helps expedite drug development. In an era when targeted cancer treatments are now a reality, the challenge we face is to continue to turn groundbreaking discoveries into lifesaving care in the clinic at an even greater speed. By fostering collaborations, we are laying the groundwork for breakthrough discoveries in cancer research that will translate into cutting-edge treatments for cancer patients.

At CINJ, we have emphasized and fostered a consortium model with local researchers at multiple institutions including UMDNJ, Rutgers and Princeton Universities. For example, efforts have led to combined science from a collaboration of laboratory and clinical researchers that resulted in the discovery of critical metabolic pathways involved in tumor cell survival and

launched several clinical trials for patients with lung, breast, colon, skin and prostate cancer that are attempting to better starve tumor cells of their nutrients. NCI-funded centers and efforts like these provide opportunities for patients never before available, and a route to improve the outcomes through effective cancer research.

Another area of funded research important to improve the quality of care of patients and reduce health care costs is comparative effectiveness research. Comparative effectiveness research seeks to optimize the use of emerging and existent therapies. For example, a team of researchers in epidemiology at CINJ recently published a landmark study that defined the proper use of hormone therapy for men with early stages of prostate cancer, which will improve patient outcomes while hopefully leading to reduced healthcare expenditures.

Other novel therapeutic trials at CINJ include a recently opened clinical trial to look at harnessing our immune system to tackle pancreatic cancer. Researchers are testing the effectiveness of a new vaccine combination injected directly into the tumor. If the results prove successful this will improve patient outcomes for one of the deadliest types of cancer. This trial is supported by the NCI and would not be possible without the ongoing research at CINJ.

Other efforts to foster collaboration include the work of AACR that underpins groups such as Stand Up To Cancer. This new initiative provides large grants awarded to research “Dream teams,” headed by multiple principle investigators who bring expertise and resources from basic, translational, and clinical research areas to bear on a single cancer problem.

Investment

It may seem to some that increasing federal support for cancer research is something the nation can't afford right now. But we can't afford not to maintain our investment – given demographic shifts now underway. Cancer's economic burden is staggering. The National Institutes of Health estimates that in 2008 the overall cost to society was more than \$200 billion: approximately \$93 billion for direct medical costs, \$116 billion for loss of productivity due to premature death, and approximately \$19 billion for loss of productivity due to the acute illness and time necessary to undergo cancer treatment. Our population is aging rapidly, and cancer is

largely a disease of aging. As a result, the total economic burden of cancer in the United States will likely continue to increase and interventions are required now to bend this health expenditure curve.

We are at a most promising time in cancer research. Our nation's investment in cancer research has brought us to the forefront of a revolution. But much more remains to be done. We have the potential to accelerate through this tipping point in time to welcome a new era of cancer treatment and prevention and gain on our investment to reduce the toll of cancer on the people and economy of our Nation.