CAR T-Cell Immunotherapy Named Advance of the Year in Annual ASCO Report

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ALEXANDRIA, Va.—A new and unique new way to treat cancer—CAR T-cell therapy—is poised to transform the outlook for children and adults with certain otherwise incurable cancers. The American Society of Clinical Oncology (ASCO) named this type of adoptive cell immunotherapy the Advance of the Year in its annual report. Released today in advance of World Cancer Day, *Clinical Cancer Advances 2018* highlights the most impactful clinical cancer research and policy developments over the past year.

CAR T-cell therapy is a treatment that uses a patient's own white blood cells, which have been genetically reprogrammed in the lab to fight their own cancer. In 2017, the U.S. Food and Drug Administration (FDA) approved two CAR T-cell therapies, to treat children and young adults with acute lymphoblastic leukemia and adults with diffuse large B-cell lymphoma. Researchers are also pursuing this approach in other types of cancer with promising results, especially in multiple myeloma.

The emergence of CAR T-cell therapy is the payoff for decades of investment by the National Institutes of Health, academic medical centers, and the pharma/biotech industry in the basic sciences of immunology, cancer biology, and genetics.

"It is remarkable to see these decades of effort come together to create this whole new type of treatment, as well as other precision medicine approaches that offer hope to people with advanced cancer," said ASCO President Bruce E. Johnson, MD, FASCO. "While we still have work to do to make these treatments accessible to patients everywhere and more tolerable, the successes of CAR T-cell therapy demonstrate the profound impact new treatments could make to markedly extend the lives of people with cancer."

New Analysis: Immunotherapy for Lung Cancer Could Save 250,000 Years of Life

Further treatment advances with immunotherapy are also transforming patient care. A new analysis from the ASCO report finds that a quarter million years of life could be saved with the use

of currently approved immunotherapies for lung cancer in the United States.

Immune checkpoint inhibitors—a type of cancer immunotherapy that unleashes the body's immune response to fight its own cancer—have transformed care for people with advanced lung cancer. Since 2015, the FDA has approved three such medicines for lung cancer: nivolumab, pembrolizumab, and atezolizumab. In clinical trials with 3 to 5 years of follow-up, people with advanced lung cancer who received immune checkpoint inhibitors have lived longer, on average, than those who received chemotherapy, but the impact of immunotherapy on longer-term survival is not yet known.

To gain insight into the potential impact of immunotherapy on long-term survival, the ASCO Center for Research and Analytics (CENTRA) developed a statistical model that uses clinical trial data on 3- to 5-year survival in patients receiving immune checkpoint inhibitors given as first-line or second-line therapy, as well as cancer incidence data. The model accounted for age and race distribution of U.S. patients with advanced NSCLC and their current life expectancy.

The model estimates that, if, each year, all 100,000 U.S. patients with advanced lung cancer for whom checkpoint inhibitors are currently indicated received the treatment, 250,000 years of life would be saved. In addition, one in four patients with newly diagnosed cancer and one in 10 with previously treated disease are expected to live substantially longer than if treated with traditional therapies, with some expected to live well beyond five years after treatment initiation.

Meanwhile, with standard chemotherapy less than 10 percent of patients are projected to live 4 years beyond diagnosis, and less than 1 percent would be alive at 10 years.

Trends in Progress Against Cancer

In addition to important gains in precision medicine approaches, *Clinical Cancer Advances 2018* highlights broad trends demonstrating continued progress, including:

- **Growth in U.S. cancer survivors:** Today, 15 million Americans—nearly one in 20—are survivors of cancer, and experts estimate that there will be 26 million survivors in the U.S. by 2040.
- **Long-term survival increasing:** About 64 percent of U.S. patients diagnosed with cancer in 2005 have lived 10 years beyond diagnosis, compared to 35 percent of those diagnosed in 1975.
- **Pace of cancer research accelerating:** The number of medical journal articles with the word "cancer" in the title quadrupled in the last decade, from about 28,000 in 2007 to 120,000 in 2017.

- **More treatments available to patients:** In the span of just one year, the FDA approved 18 new therapies and 13 new uses for more than 16 types of cancer. (During the same timeframe in the previous year, eight new cancer therapies and 13 new uses were approved.)

“When I stand back and look at the research progress documented in this report, I’m truly excited for our patients,” said John Heymach, MD, PhD, co-executive editor of *Clinical Cancer Advances*. “If we want to keep up the pace, we need to continue investing in the broad spectrum of cancer research, from prevention and screening to treatment and survivorship.”

Critical Impact of Federal Research Investment

According to the ASCO report, the breakthroughs of the past 50 years could not have been achieved without our nation’s ongoing investment in cancer research. More than 25 percent of the top advances featured in the *Clinical Cancer Advances 2018* report received funding support from the National Institutes of Health (NIH) and other federal agencies. In fact, federal investment was critical to early research on CAR T-cell therapy, ASCO’s Advance of the Year.

Continued progress against cancer requires dependable, robust federal support, and 91 percent of Americans agree that the U.S. government should dedicate substantial funding to diagnose, prevent, and treat cancer. Furthermore, nearly three in four Americans (73 percent) say the government should spend more to develop cancer treatments and cures, even if it means higher taxes or adding to the deficit, according to ASCO’s 2017 *National Cancer Opinion Survey*.

Despite a boost in funding for NIH and the National Cancer Institute (NCI) in fiscal year 2017, NCI’s budget, when adjusted for inflation, remains below pre-recession levels. Flat funding makes it more difficult to recruit and retain young researchers to the field and translates into less innovation, fewer studies launched, and fewer discoveries.

“Americans are looking to Congress to continue to support investment in innovative cancer research,” said Dr. Johnson. “Continued progress in developing transformative cancer treatments depends on it.”

Clinical Cancer Advances, developed under the direction of a 20-person editorial board, is now in its 13th year of publication. The report is published online at asco.org/CCA and in the *Journal of Clinical Oncology*.

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