OUR TIME BEGAN with an empty lot and a dream full of promise, determination, and audacity.

A dream to do the impossible. Achieve the unachievable. Defeat the undefeatable.

AS JON M. HUNTSMAN SAYS, "Cancer moves fast. And we have to move faster."
VICE PRESIDENT JOE BIDEN VISITED HCI FEBRUARY 26, 2016, AS A PART OF THE WHITE HOUSE’S CANCER MOONSHOT INITIATIVE. HE TOURED THE FACILITY AND PARTICIPATED IN A ROUNDTABLE DISCUSSION WITH HUNTSMAN CANCER FOUNDATION BOARD CHAIR GOVERNOR JON M. HUNTSMAN; HCI CEO AND DIRECTOR MARY BECKERLE, PhD; SENATOR ORRIN HATCH; UNIVERSITY OF UTAH HEALTH CARE CEO AND SENIOR VICE PRESIDENT FOR HEALTH SCIENCES, VIVIAN LEE, MD, PhD, MBA; AND LOCAL CANCER SURVIVORS AS WELL AS CANCER PHYSICIANS AND RESEARCHERS.
Exceptional.

At Huntsman Cancer Institute (HCI), it’s more than a word. It’s the standard to which we hold every aspect of our organization.

Exceptional means a willingness to take a critical look at your work and honestly ask if your contributions make a difference in the lives of cancer patients and their families. Exceptional requires bold vision, a willingness to take risks, and nimble recalibration when things aren’t working as planned. It means patient satisfaction ratings in the 99th percentile nationwide. It means novel research published in prestigious, peer-reviewed journals and supported by the best funding agencies. It means the most innovative clinical trials for our patients.

Exceptional is the standard we set for ourselves. HCI’s world-class, state-of-the-art cancer research programs were awarded status as a National Cancer Institute Comprehensive Cancer Center in 2015. The highest designation possible, our peers include distinguished institutions such as MD Anderson Cancer Center, Memorial Sloan-Kettering Cancer Center, and Dana-Farber Cancer Institute of Harvard University.

And 2016 may be the start of our most exceptional achievements yet. After President Obama announced his Cancer Moonshot Initiative during the 2016 State of the Union, the man he put in charge of “mission control,” Vice President Joe Biden, came to HCI to learn about how our unique resources can be applied on a national scale to accelerate cancer research and save lives. HCI has shown how exceptional assets like the Utah Population Database—the largest of its kind in the world that combines family histories with medical records—can be used to find some cancers at their earliest, most treatable stages, and sometimes stop cancer from ever occurring using precision prevention. The Vice President heard about how HCI works to eradicate cancer disparities across the vast Mountain West, and how we work on innovative cancer care approaches to improve treatments for people with cancer and their caregivers.

Some say curing cancer is impossible. Being exceptional means knowing that nothing is impossible. I am inspired by the words of our founder, Jon M. Huntsman: “I have always viewed hurdles and challenges as opportunities to move ahead.”

The bar could not be higher. The challenge could not be greater. We all must be committed to exceptional if we are to launch this “cancer moonshot”—one of the greatest challenges ever known. Nothing less than exceptional is acceptable as we move ahead.

Sincerely yours,

Mary Beck
do

CEO AND DIRECTOR
HUNTSMAN CANCER INSTITUTE
EACH YEAR, researchers at Huntsman Cancer Institute (HCI) make discoveries—large and small—that enhance our understanding of how and why cancer develops, as well as its long-term effects on health and well-being.

When Cancers of Unknown Origin Strike, Family Members Are at Increased Risk

Cancer usually begins in one place and spreads, but in patients with cancers of unknown primary (CUP) origin, the starting point is unclear. “This means we are not able to select a type of chemotherapy or radiotherapy that the cancer would respond to best,” says HCI investigator Jewel Samadder, MD, MSc. He led a study published in the *Journal of the American Medical Association Oncology* that found family members of patients with CUP origin have a higher risk of also developing unnamed cancers. Their risk for cancers of the lung, pancreas, colon, and some blood cancers is also higher. “Knowing this opens up a new way of looking at the biology of cancers of unknown primary,” Samadder says. “We need to research whether chemotherapy should be tailored to one of these sites.”

New Understanding of Aspirin’s Role in Cancer Prevention

An HCI study adds to the evidence that aspirin can prevent some cancers and points to a new biological pathway that deserves further investigation. Aspirin decreases the risk of colorectal, and possibly other, cancers. However, better understanding of how it works is essential before recommending it generally as a means to prevent cancer. In a study published in the journal *Cancer Epidemiology, Biomarkers, and Prevention*, Cornelia Ulrich, PhD, MS, Senior Director of Population Sciences at HCI, and her collaborators used a new technique called metabolite profiling. Their study shows aspirin substantially decreases the level of a chemical considered a driver of cancer development. Ulrich says, “It is really exciting that aspirin, which can work in colorectal cancer prevention, is now linked to a new pathway that has shown to be relevant for cancer formation.”
New Strategies to Support Survivors of Childhood Cancers

Today, more than 80% of children with cancer survive to become adults. However, many face health-related challenges and medical issues that keep them from working. A study led by Anne Kirchhoff, PhD, MPH, an HCI investigator, shows childhood cancer survivors are more than five times as likely to enroll in federal disability assistance compared to people without a cancer history. “The long-term impact of cancer can affect other issues besides health outcomes,” says Kirchhoff. “There’s a growing strategy to support survivors in the long term.” HCI’s Pediatric Cancer Late-Effects Clinic is one example. This clinic provides adult survivors of childhood cancers with health management resources, including access to providers. The study was published in the *Journal of the National Cancer Institute.*

Tracking Sugar to Determine a Woman’s Breast Cancer Risk

Triple-negative breast cancers are often more aggressive with fewer treatment options than other types of breast cancer. Many cancer cells, including triple-negative cells, are addicted to the sugar glucose and the amino acid glutamine. “You could imagine that cells addicted to these nutrients could be starved and killed more easily than normal cells,” says senior author Don Ayer, PhD, an HCI investigator. Two proteins called Myc and TXNIP usually work together to keep glucose use and cell growth in balance. In triple-negative breast cancer, Ayer and his collaborators found an abnormal interaction between the two proteins significantly increases glucose use and cell growth. These proteins also appear to play a role in the spread of cancer to other parts of the body. Ayer says if the result is validated in clinical trials, then this Myc/TXNIP signature could identify women at high risk for cancer recurrence. The study appeared in *Proceedings of the National Academy of Sciences.*
Looking for Grand-Scale Answers to Cancer Questions

Elephants have 100 times as many cells as people. It seems they would be 100 times more likely to get cancer over their long life span of 50 to 70 years. Yet, elephants rarely get cancer. A study led by researchers at HCI and Arizona State University may have discovered why. Elephants have dozens more copies of a gene that blocks tumors than humans do. Elephants may also have a better way to kill damaged cells that could become cancerous. “Nature has already figured out how to prevent cancer. It’s up to us to learn how different animals tackle the problem so we can adapt those strategies to prevent cancer in people,” says Joshua Schiffman, MD, an HCI investigator and pediatric oncologist. He is co-senior author of the paper published in Journal of the American Medical Association.

Improving Outcomes for Myeloma Patients Who Face Grim Odds

It’s a sobering statistic: an average of 43% of multiple myeloma patients die within five years of diagnosis. What’s more, a recent study found multiple myeloma patients with a variation in the gene FOPNL die one to three years sooner. The largest study of inherited genetics and myeloma survival to date, the collaboration included researchers from HCI and 17 other institutions. “We were able to identify the FOPNL variant because it has quite a large effect on survival. With even larger collaborative studies, we hope to add to this,” says HCI investigator Nicola Camp, PhD. Published in Nature Communications, the results are a step toward applying precision medicine to this aggressive cancer that affects bone marrow cells involved in coordinating the body’s immune response. Future studies will focus on finding therapies to improve prospects for this newly identified group of FOPNL patients.
Giving Family Prostate Cancer History the Third Degree

A study led by HCI investigator Lisa Cannon-Albright, PhD, shows that whether a man's uncles and great-grandparents had prostate cancer could be as important as whether his father had prostate cancer. Taking a more complete family history that includes these second- and third-degree relatives would give a better picture of a patient’s prostate cancer risk. “Typically, a clinician will ask a patient whether there are any people in the family with prostate cancer, possibly identifying whether they are first-degree relatives. And that’s about as far as it goes,” says Cannon-Albright. Her team, including Neeraj Agarwal, MD; Frederick Albright, PhD; and Robert Stephenson, MD, used information from the Utah Population Database to create individualized risk estimates for men based on prostate cancer history in their first-, second-, and third-degree relatives. Published in the journal *Prostate*, the study also showed family history of prostate cancer in maternal relatives is just as important. “Family history data is an economically sustainable, viable, powerful, and effective way to accurately estimate prostate cancer risk,” says Cannon-Albright.
By The Numbers

PATIENT CARE

4,000 new cancers diagnosed
1,200 genetic counseling consultations provided
125,000 outpatient visits hosted

RESEARCH

200 clinical trials open at any given time
> $93 million invested in research across the cancer center
162 faculty research teams investigating all aspects of cancer

MORE THAN 450 cancer research projects supported by scientific funding agencies
MORE THAN 460 papers accepted for publication in peer-reviewed scientific journals

A GIVEN DAY AT HCI

15 surgeries
70 inpatients
83 infusion treatments
110 radiation therapy treatments
245 radiology procedures
354 outpatient visits

PERSONNEL

1,600 employees
183 volunteers completed 16,875 hours of service in 2015
Provided cancer training to 350 students

EDUCATION AND OUTREACH

HCI Cancer Learning Center served nearly 14,000 individuals in 2015 through visits, calls, and emails.
More than 73,000 individuals reached through community health events.

MAJOR EXPANSION TO OPEN IN 2017

The Primary Children’s and Families’ Cancer Research Center
220,000 sq. ft. expansion will double HCI’s research capacity

HCI manages the UTAH POPULATION DATABASE - the largest genetic database in the world with more than 16 million records linked to genealogies, health records, and vital statistics.
Nothing is too hard, nothing is too far, and nothing that is impossible can't be done.

CHANGING THE DNA OF CANCER CARE
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