The Huntsman Cancer Institute (HCI) mission is to understand cancer from its beginnings, to study and disseminate new knowledge in the creation and improvement of cancer treatments, and to provide education about cancer risk, prevention, and care.

- 1,408 employees
- 158 volunteers gave 19,000 hours of service

The HCI team consists of University of Utah Health Care employees, and several others.

HCI's discoveries in cancer genetics have improved the lives of millions worldwide. We were one of the first cancer centers to establish high-risk cancer clinics, providing families that have unusually increased rates of cancer with scientifically proven resources and strategies to understand and manage their risk. The impact is clear: for the first time ever, individuals were empowered to take steps to prevent the disease from ever occurring. For individuals who developed a cancer related to a cancer-causing gene, targeted treatments were tailored to be more effective. And our understanding of cancer in the general population has advanced significantly.

The Top Science Report describes some of HCI's most exciting recent progress. We highlight just a few of these accomplishments that embody our great strength in advancing scientific discovery in HCI's labs and clinics, creating innovations in cancer care and prevention, and, ultimately, impacting human health.

You don't have to take our word for it. Each of the stories described in this report were accepted for publication in some of the world’s most prestigious peer-reviewed academic journals. This means these top science highlights underwent rigorous scientific scrutiny by experts in the field—and they succeeded, standing above thousands of others submitted for consideration, singled out for their major contributions to the field of cancer research.

Your support of this lifesaving work is central to our success. Thank you for all you do to advance the mission of HCI. With your help, we truly make a difference for cancer patients and their loved ones.

The Huntsman Cancer Institute (HCI) is known throughout the world for our discovery of cancer-causing genes, innovation in clinical care and research for families affected by cancer, and the impact on quality of life for those at all stages of cancer.

Karen and Jon M. Huntsman
Founders and Principal Benefactors

Innovative Cancer Awareness Expo, a free-to-the-public event featuring talks by cancer care providers, booths staffed by lab researchers, and free cancer screenings

116 health conferences, reaching an estimated 113,000 people

More than 6,000 visitors to our award-winning Cancer Learning Center

Hundreds of presentations to schools and community groups, reaching 7,500 people

Training the next generation of cancer researchers and care providers:

- More than 100 postdoctoral fellows across the Cancer Center working toward research careers
- 14 fellows in the Cancer Hospital advancing their clinical training in hematology/oncology
- 12 nurses receiving specialized oncology training in the Cancer-causing gene clinic, preventive treatments were tailored to be more effective.

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This document provides a glimpse of what you’ll find in expanded stories and videos online: www.huntsmancancer.org/topscience2012

Huntsman Cancer Institute is part of the University of Utah Health Care system.

Cancer Research Funding

<table>
<thead>
<tr>
<th>Sources (millions)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Revenue</td>
<td>40.3%</td>
</tr>
<tr>
<td>Grants and Contracts</td>
<td>37.8%</td>
</tr>
<tr>
<td>Other Revenue</td>
<td>17.1%</td>
</tr>
<tr>
<td>State of Utah</td>
<td>10.6%</td>
</tr>
<tr>
<td>Cancer Hospital</td>
<td>9.3%</td>
</tr>
<tr>
<td>Endowment Gifts</td>
<td>2.9%</td>
</tr>
<tr>
<td>Gift Income</td>
<td>1.7%</td>
</tr>
<tr>
<td>Other Expenditures</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Uses (millions)

- Direct Cancer Research: 66.7%
- Administration and Facilities: 10.5%
- Prevention and Community Engagement: 12.3%
- Other Expenditures, 5.2%
Inherited Cancer Genes: Survival of the Fittest?

If evolution allows only the fittest to survive, why do some harmful gene mutations stay around for generations? That’s the question Geri Mineau, PhD; Saundra Buys, MD; and Ken Smith, PhD, along with doctoral student Heidi Hanson, asked about inherited mutations in BRCA1/2 that increase the risk of breast, ovarian, and other cancers in families. Learn the answer they discovered using the Utah Population Database.

The Warburg effect refers to the observation that cancer cells produce energy differently than normal cells. It’s a basic principle in cancer research even today. For decades, researchers worldwide have studied the Warburg effect, but in 2012 a team of scientists working at Huntsman Cancer Institute, along with colleagues at the University of Texas MD Anderson Cancer Center, published groundbreaking research that fundamentally changed our understanding of cancer biology.

Lung Cancer: No Longer a Veritable Death Sentence

Until recently, doctors were rapidly screening for lung cancer only when a patient showed symptoms—which often means the disease is advanced and untreatable. A study using low-dose computed tomography showed such promise it is now part of the National Comprehensive Cancer Network lung cancer screening guidelines. Cancer surgeon Shamus Carr, MD, FACSC, explains HCG role and how our Cancer Hospital was the first in Utah to offer this new screening based on the guidelines.

A Mission to Improve Young Patients’ Survival Odds • To Kevin B. Jones, MD, survival chances of his young patients. The discovery—named one of the top five papers of 2012—may lead to improved breast cancer prevention, diagnosis, and ultimately, longer lives for patients.

New Guiding Principles in Cancer Gene Research • A discovery by Jody Rosenblatt, PhD, published in the journal Nature, shows that cells in normal epithelium (tissues that line inner and outer surfaces of the body) have “personal space issues.” When new cells are formed, the tissue pushes other cells out to make room. In the absence of this behavior— called extrusion—cells pile up and form masses. Rosenblatt and her lab are the first to identify this new link between cell birth and cell death and how extrusion appears to be related to tumor formation.

Beyond BRCA1/2: A New Breast Cancer Gene Identified

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Genomics Unlocks Understanding of Key Cancers • The key to better cancer treatments lies in our genes. That’s what Joshua Schiffman, MD, believed when he and his team began researching the genetics of Ewing sarcoma. Using groundbreaking technology to look at decades-old tissue samples, the researchers made several discoveries that were published in Cancer Genetics. These findings may lead to more effective treatments for this deadly childhood’s cancer, and hope for families affected by it.

Collaboration Leads to Possible New Treatment for Childhood Cancer • Two heads are better than one, they say—and HCI investigators have proved it. By combining basic science research and clinical research, Stephen Lessnick, MD, PhD, and Sunil Sharma, MD, found a possible new drug for Ewing sarcoma, an often deadly cancer that affects children and young adults. Results of the study were published in Oncogene.

Young Adult Cancer Survivors: Skipping Care When Still at Risk? • The great news: 90 percent of the 60,000 U.S. young adults diagnosed with cancer each year survive at least five years. Yet many develop chronic health problems because of cancer treatments. Routine medical care can prevent this. A study by Anne Kirchhoff, PhD, published in the journal Cancer, found one-third of young cancer survivors forgo medical care. Find out why—and how HCI’s Pediatric Cancer Late Effects Clinic aims to help.

How Evolution Shapes a Child’s Cancer Genes

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Cover photo: Slice of developing mouse colon as seen through a confocal microscope • Melinda Angus-Hill Lab

After a Century of Research, New Clues about Cancer Cell Metabolism

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