# 25 YEARS.
# THOUSANDS OF STORIES.
# **ONE GOAL.**

HOLDEN COMPREHENSIVE CANCER CENTER
**2025 ANNUAL REPORT**

IOWA HEALTH CARE | Holden Comprehensive Cancer Center

HOLDEN

# FIRSTS

**University of Iowa Health Care Holden Comprehensive Cancer Center was the first to offer Iowans**

- a total esophagectomy (removal of a cancerous esophagus) with a minimally invasive robot.
- the MammoSite procedure (inserting radioactive seeds after a breast lumpectomy using a catheter), which causes less radiation damage to surrounding tissue.
- PET/CT scans for cancer diagnosis.
- a Cancer Information Service phone line dedicated to helping patients and families get answers to cancer-related questions.
- post-surgery Botox injections for neck cancers to facilitate speech and to address neck spasms following radiation.
- laryngeal surgery for paralysis of the larynx (voice box in your neck).
- a treatment for neck cancer using Gore-Tex implants.
- CAR T-cell therapy.
- MR-linac radiation therapy treatment.
- contrast mammography.
- many immunotherapy treatments and clinical trials.

**Holden Comprehensive Cancer Center advanced cancer care by**

- participating in a National Lung Screening Trial to compare chest X-rays and CT scans for early diagnosis of lung cancer. Holden was the only one in the state and one of 12 U.S. sites involved.
- developing a vaccine for prostate cancer treatments.
- researching digital mammography to determine if it is a more effective method for detecting breast cancer tumors.
- developing and being one of several national sites studying a cervical cancer vaccine for cancer prevention.
- directing and completing one of the largest clinical trials for superficial bladder cancer, comparing a new immunotherapy treatment involving BCG plus Interferon.

# HOLDEN CELEBRATES 25 YEARS AS AN NCI-DESIGNATED COMPREHENSIVE CANCER CENTER

- Cancer research labs in MERF built
- Lymphoma SPORE (2002–2022)

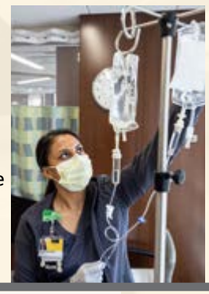
UNIVERSITY OF IOWA HOLDEN COMPREHENSIVE CANCER CENTER
University of Iowa Health Care

MAYO CLINIC Cancer Center

NCI CCC — A Comprehensive Cancer Center Designated by the National Cancer Institute

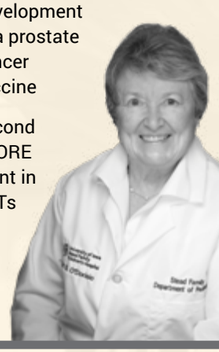
- Lymphoma SPORE renewed for an additional 5 years with outstanding priority score
- Hope Lodge built
- Cancer recognized as a top priority area in UI Health Care strategic plan
- Holden initiates the Population Science Pilot Project awards
- Formal creation of MOGs

- Clinical Research Leadership Committee established
- Holden cancer clinic and infusion suite located in the Pomerantz Family Pavilion opened



- Molecular pathology lab created
- Holden Education Committee formed
- Trainee Cancer Conference initiated
- The first genetically engineered pig model of cancer/study published in The *Journal of Clinical Investigation*


- Development of a prostate cancer vaccine
- Second SPORE grant in NETs



2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016

- $25M donation from Holden family

**September**
Changed name to Holden Comprehensive Cancer Center to honor Holden family support

**December**
NCI comprehensive cancer center status received: the NCI's highest distinction

NCI Designated Comprehensive Cancer Center

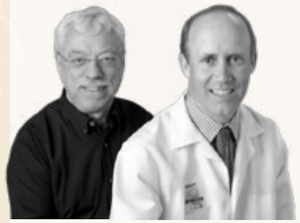
- Roland and Ruby Holden Cancer Research Laboratories opened


- First NCI CCSG renewal
- Cancer Research Opportunities at Iowa (CROI) program launched

Iowa Cancer Consortium
www.canceriowa.org

- Oncology Registry
- Collaboration with Iowa Cancer Consortium begins
- Work to develop RNA-based therapeutics for cancer

- Second NCI CCSG renewal
- 7 Doris Duke fellows have worked on cancer research projects with Holden members



NCI funded R21; Buettner and Cullen explore therapeutic effects of Vitamin C for pancreatic cancer

- Holden Executive Board established
- Focus on recruitment of clinical investigators
- Third NCI CCSG renewal

NCI Designated Comprehensive Cancer Center

## 2003-2008

**Holden receives P20 in cancer and aging. The research it supported was highly effective in stimulating research that overlaps these two areas of increasing importance with respect to both biomedical research and the overall health of our citizens.**

## 2013-2014

**Holden members are heavily involved in UI STEM education programs. These programs engaged 13,500 elementary and secondary students from 100 schools, including 20% of students from underrepresented or disadvantaged backgrounds.**


MR-linac technology introduced

Formation of Community Advisory Board

3-year American Cancer Society grant to found the ICARE post-baccalaureate program

5-year R25 YES Grant

2017 2018 2019 2020 2021 2022 2023 2024 2025

Ascorbate grant P01

First CAR T-cell therapy patient treated

Cancer biology graduate program launched

Fourth NCI CCSG renewal

Partnership with Mission Cancer + Blood

NET SPORE renewal

Celebrating 25 years as an NCI comprehensive cancer center

# 2000

## Holden Comprehensive Cancer Center

### Rooted in Hope, Recognized for Excellence

**IN 2000,** a remarkable act of generosity and national recognition came together to shape the future of cancer care, research, and education at the University of Iowa. University of Iowa Health Care Holden Comprehensive Cancer Center adopted its name and received its designation as a comprehensive cancer center from the National Cancer Institute (NCI)—the NCI's highest distinction.

Holden Comprehensive Cancer Center is named after a Williamsburg, Iowa, family who made a generous $25 million donation through the University of Iowa Center for Advancement in honor of Ronald W. Holden, who died from leukemia in 1995. Moved by the exceptional care he received at the UI, the Holden family committed to supporting our physicians, researchers, and other health care professionals in their efforts to find cures, treatments, and hope for cancer patients and their families.

That same year, the University of Iowa became home to the state's first—and still only—NCI-Designated Comprehensive Cancer Center. This designation places the center within an elite network of institutions recognized for their scientific excellence and their capability to translate discoveries into improved treatments for patients. It acknowledges years of collaboration among scientists, clinicians, and community partners united by the mission to advance cancer prevention, diagnosis, and care.

"The designation highlights the ability of physicians and scientists to translate cancer research advances into patient care as quickly as possible," says then-director **George Weiner,** MD. "It also speaks to the teamwork that takes place in a comprehensive cancer center, so the whole is greater than the parts. The designation is a true honor."

Together, the Holden family vision and the NCI recognition marked the beginning of a legacy rooted in hope, driven by discovery, and sustained by a steadfast commitment to improving and saving lives.

> "The designation highlights the ability of physicians and scientists to translate cancer research advances into patient care as quickly as possible. It also speaks to the teamwork that takes place in a comprehensive cancer center, so the whole is greater than the parts. The designation is a true honor."

GEORGE WEINER, DIRECTOR EMERITUS OF HOLDEN COMPREHENSIVE CANCER CENTER


This year, we celebrate a remarkable milestone—25 years as an NCI-Designated Comprehensive Cancer Center. It's an achievement that speaks not only to our scientific excellence, but to the compassion, resilience, and teamwork that have defined Holden from the very beginning.

Thinking about these past 25 years, what stands out most isn't a single breakthrough or discovery—it's the people. Every advance, every new therapy, every moment of hope begins with a person. The patient who participates in a clinical trial. The researcher who spends years pursuing an idea that could change how we treat cancer. The nurse who offers comfort during the hardest days. The family member who never stops believing. Together, they and their stories are the heart of Holden.

Our journey is one of constant growth and collaboration. We've expanded our reach across Iowa and beyond, building partnerships to bring cutting-edge care close to home. We've deepened our commitment to understanding the needs of our communities to ensure that every Iowan has access to the best possible cancer care. And through it all, we've remained guided by our mission—to defeat cancer.

Anniversaries like this are about more than looking back. They're a chance to pause and appreciate how far we've come and imagine what comes next. Cancer research and care are changing faster than ever, and Holden is poised to lead the way. Today we are investing in new ideas, new technologies, and, most importantly, new people—the next generation of scientists and clinicians who will carry this work forward.

As we celebrate 25 years, I invite you to reflect on your own connection to Holden. Whether you're a patient, a supporter, a partner, or a member of our incredible team—however your story connects to Holden—it's part of the larger legacy we're honoring this year.

Thank you for being part of our journey and for helping us continue pushing forward. Together, we'll write the next chapter—one story, one Iowan, one breakthrough at a time.

Mark E. Burkard, MD, PhD
Director
University of Iowa Holden Comprehensive Cancer Center





# 2008

## Building a Culture of Collaboration

### Holden's Multidisciplinary Oncology Groups

**IN 2008,** Holden Comprehensive Cancer Center formally established its Multidisciplinary Oncology Groups (MOGs)—a defining milestone in the center's evolution and a model of team-based cancer care. Designed to bring together clinicians, researchers, and specialists across disciplines, MOGs ensure that every patient benefits from the full depth of Holden's expertise and the latest research advances.

These groups have transformed the cancer care organization at Holden. Each MOG convenes experts in surgery, medical oncology, radiation oncology, pathology, radiology, nursing, and basic and population sciences to review cases, discuss research opportunities, and shape individualized treatment plans.

"These teams come together for many reasons," says **Mohammed Milhem,** MBBS, Clinical Professor of Internal Medicine–Hematology, Oncology, and Blood and Marrow Transplantation. "The biggest reason is to take care of the patient and to minimize the errors that could occur if people didn't properly communicate with each other in the care of a patient."

That spirit of collaboration has since become one of Holden's defining strengths. Over time, the MOGs expanded to encompass nearly every cancer type—from breast and lung to neuroendocrine tumors and hematologic malignancies. Each group now serves as both a clinical forum and a bridge to translational research, connecting patients to promising clinical trials and emerging therapies.

The impact of our MOGs is clearly visible today through improved communication, coordinated care, and the ongoing translation of scientific findings into effective healing practices. For example, our new Iowa Molecular Tumor Board initiative invites providers from across the country to join in case discussions, connecting even more patients to advanced treatments and clinical insights. It's a modern expression of the same core idea that started it all: that collaboration leads to better care and better outcomes for every Iowan facing cancer. What began as an experiment in teamwork has evolved into a defining characteristic of how Holden fulfills its commitment to advancing discovery, enhancing care, and prioritizing patients in every decision we make.

“These teams come together for many reasons. The biggest reason is to take care of the patient and to minimize the errors that could occur if people didn’t properly communicate with each other in the care of a patient.”

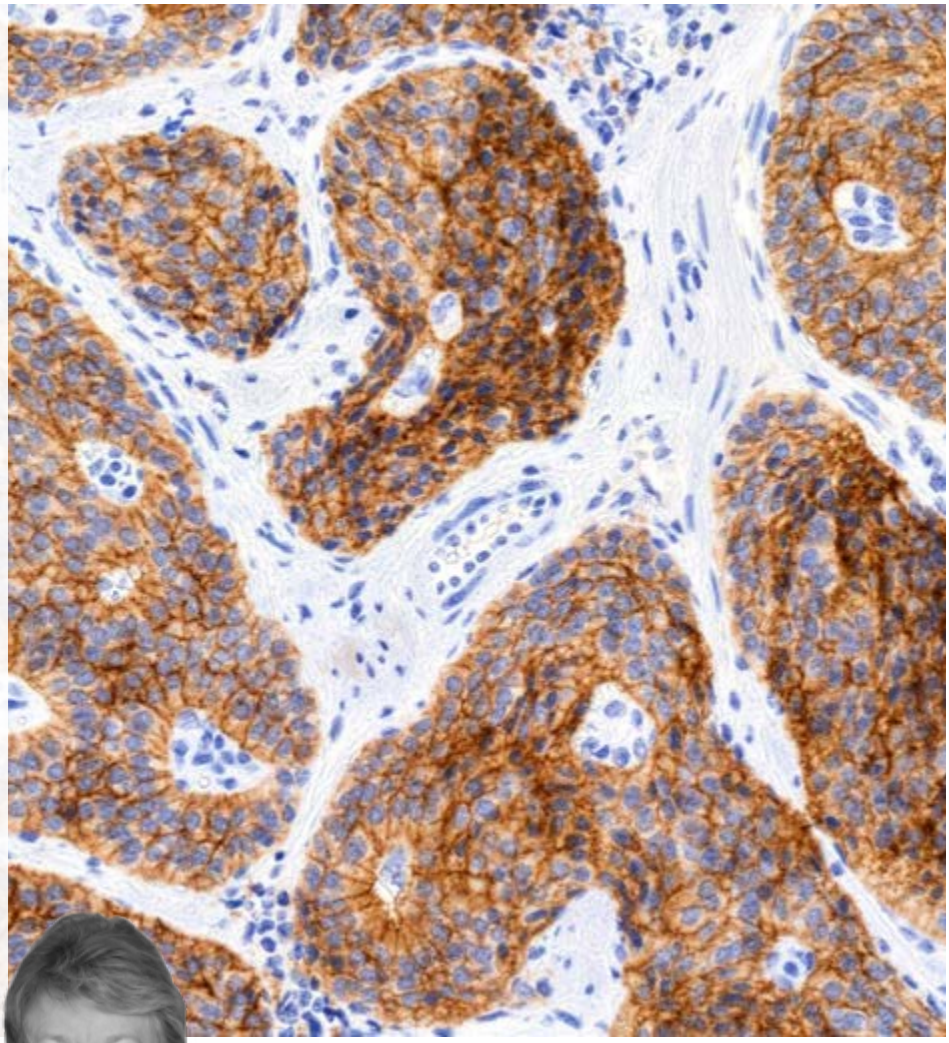
MOHAMMED MILHEM, MBBS, CLINICAL PROFESSOR OF INTERNAL MEDICINE–HEMATOLOGY, ONCOLOGY, AND BLOOD AND MARROW TRANSPLANTATION

## HOLDEN’S MOGS

- Breast Cancer
- Colorectal Cancer
- Endocrine Cancer
- Gastrointestinal Cancer
- Genitourinary Cancer
- Gynecologic Cancer
- Head and Neck Cancer
- Hepatobiliary Cancer
- Leukemia
- Lymphoma
- Melanoma
- Multiple Myeloma
- Neuroendocrine Cancer
- Neurological Cancer
- Pediatric Cancer
- Sarcoma
- Thoracic Cancer

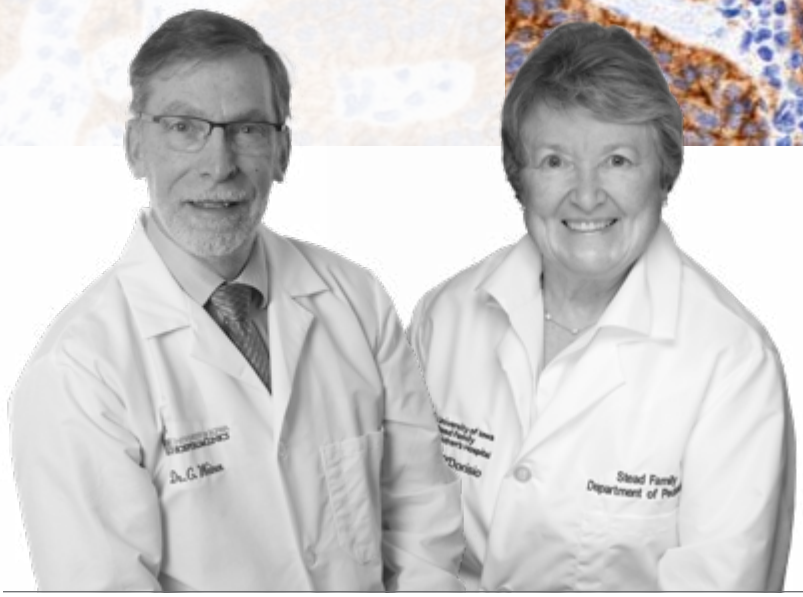
# 2015

## Holden Researchers Receive First-in-the-Nation Grant to Study Neuroendocrine Tumors



"This second SPORE at Holden—and the first ever for neuroendocrine tumors—speaks volumes to the level of trust our peers have had in our research team and our institution."

GEORGE WEINER, DIRECTOR EMERITUS OF HOLDEN COMPREHENSIVE CANCER CENTER



"The incidence of neuroendocrine tumors has incr decades, and many patients are not diagnosed un grant is based on the hypothesis that analyzing th tumors will help identify key mutations and metab diagnosis and curative therapies."

SUE O'DORISIO, FORMER PROFESSOR OF PEDIATRICS IN THE AND THE UI STEAD FAMILY CHILDREN'S HOSPITAL

**RESEARCHERS** at the University of Iowa Health Care Holden Comprehensive Cancer Center received the first Specialized Programs of Research Excellence (SPORE) grant on neuroendocrine tumors (NETs) in 2015. Funded by the National Cancer Institute (NCI), the five-year, $10.67 million award was the only SPORE grant in the nation supporting NET research.

**Sue O'Dorisio**, former professor of pediatrics in the Stead Family Department of Pediatrics and the UI Stead Family Children's Hospital, served as the grant's principal investigator.

Neuroendocrine tumors are slow-growing cancers that arise in areas where the nervous and endocrine systems intersect—most often in the small intestine, lungs, and pancreas. Although typically affecting adults, NETs can also occur in children and are related to pediatric cancers such as medulloblastomas and neuroblastomas.

"The incidence of neuroendocrine tumors has increased five-fold over the last three decades, and many patients are not diagnosed until the tumors have metastasized," said O'Dorisio. "Our grant is based on the hypothesis that analyzing the gene expression profiles of these tumors will help identify key mutations and metabolic changes that can lead to earlier diagnosis and curative therapies."

The SPORE supported four major projects that explored the genetics of these tumors, their molecular composition, and the development of new approaches to diagnosis and treatment. Researchers from pediatrics, internal medicine, surgery, radiology, pharmacology, pathology, radiation oncology, epidemiology, biostatistics, chemistry, and biomedical engineering collaborated on this effort.

Holden and UI Children's Hospital became the only centers in the country where both adult and pediatric patients with these diagnoses could access this innovative tumor-targeted care.

**George Weiner**, director emeritus of Holden Comprehensive Cancer Center, adds, "This second SPORE at Holden—and the first ever for neuroendocrine tumors—speaks volumes to the level of trust our peers have had in our research team and our institution. It solidifies our status as a world leader in both research and treatment of neuroendocrine cancer."

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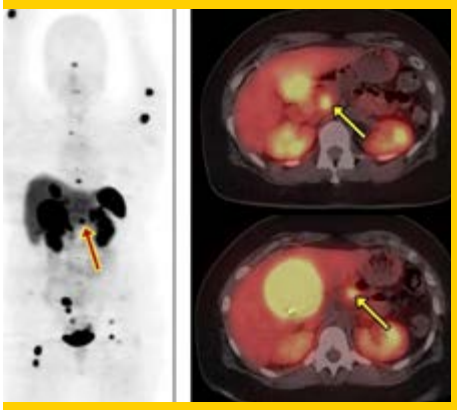
STEAD FAMILY DEPARTMENT OF PEDIATRICS



**$^{68}$Ga-DOTATOC PET scan identifies unknown primary small bowel NET in patient with metastatic disease**

## Continued Success Post-Grant

The first NET SPORE grant laid the groundwork for transformative progress in neuroendocrine tumor research. A Holden–led effort resulted in FDA approval of a novel theranostic drug in 2019. By developing a cyclotron-based production process for the radioactive isotope gallium-68 (Ga-68), the team enabled the efficient manufacture of the theranostic agent Ga-68 DOTATOC for imaging of small-bowel and pancreatic neuroendocrine tumors. This breakthrough not only doubled the daily patient scan capacity at UI Health Care but also paved the way for applying the same production strategy to other cancers, including prostate cancer.

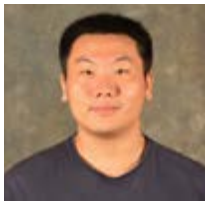
## NET SPORE Today

As dedicated as ever, 2025 Iowa NET SPORE researchers are exploring targeted therapies that attack tumors while leaving healthy tissue unharmed. They are studying the effects of common, increasingly used diabetes and weight-loss drugs on NET growth and testing treatments in clinical trials. These innovative approaches and therapies are expected to benefit NET patients and may also apply to other chemotherapy-resistant and immunologically "cold" cancers, such as prostate and breast cancer.

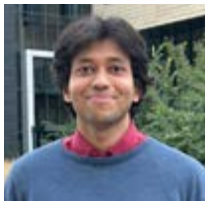
# 2018

## Launching the Cancer Biology Program

A New Era in Cancer Education at the University of Iowa





### Congratulations to our 2025 Cancer Biology graduates!

We can't wait to see where their careers and discoveries take them next.

**“I witnessed pretty much everything. Seeing these patients pushed me to discover biology that could be targeted in the clinic.”**

2022 CANCER BIOLOGY GRADUATE KEITH GARCIA

**THE UNIVERSITY OF IOWA** took a major strategic step forward in cancer research and training with the launch of the Cancer Biology Program under the Carver College of Medicine. With the full support and resources of Holden Comprehensive Cancer Center, the program represents the first graduate degree track at UI expressly devoted to the biology of cancer.

The mission of the Cancer Biology Program is ambitious: to provide PhD students with advanced knowledge of molecular, cellular, and genetic mechanisms underlying cancer, hands-on experience with experimental techniques, and exposure to the real-world challenges faced by oncologists.

The curriculum blends core courses common to biomedical sciences in the first year with later specialized training in cancer biology topics. Students also complete shadowing rotations with clinical oncologists, so their research remains anchored in clinical relevance—bridging the gap between lab bench and bedside.

2022 Cancer Biology graduate **Keith Garcia** recalls, “I witnessed pretty much everything,” Garcia says, adding that the experience gave him a heightened sense of urgency. “Seeing these patients pushed me to discover biology that could be targeted in the clinic.”

By launching this specialized graduate program, Holden Comprehensive Cancer Center reaffirms its commitment not only to cutting-edge research but also to building the next generation of cancer scientists. The program strengthens the cancer center’s educational mission: to foster interdisciplinary collaboration, unify basic science and cancer care, and prepare trainees for careers in academia, industry, or translational research.

Since its 2018 launch, the Cancer Biology Program has become an integral pillar of Holden’s portfolio. It serves as a magnet for students who want to dive deeply into cancer mechanisms, while benefiting from the resources, mentorship, and infrastructure of a comprehensive cancer center. In turn, Holden gains a steady pipeline of highly trained young scholars who can contribute to its research goals, help translate discoveries into therapies, and support the long-term vision of making Iowa a leader in cancer innovation and patient care.

Looking ahead, the success of the Cancer Biology Program will be measured not only by dissertations awarded, but by publications, collaborative projects with clinical teams, and the downstream impact its graduates have on cancer treatment and prevention. By seeding strong educational roots in 2018, Holden Comprehensive Cancer Center continues to nurture hope for students, patients, and the future of cancer biology.

# 2025 Mission: Accessible


**THROUGH INFORMATION SHARING** and alignment of resources, UI Health Care and Mission Cancer + Blood give patients access to the latest cancer treatments and clinical trials.

At the end of 2024, UI Health Care and Mission Cancer + Blood first announced their intent to join forces to fight cancer in Iowa.

At the start of this year, the Des Moines-based Mission Cancer + Blood officially became part of University of Iowa Health Care, thereby establishing a comprehensive and statewide care network uniquely positioned to address the state's elevated cancer rates.

Iowa has the second-highest age-adjusted rate of new cancers diagnosed, according to the latest Cancer in Iowa report from the Iowa Cancer Registry, which estimates that 21,200 Iowans will be diagnosed with cancer in 2025.

Improving cancer outcomes in Iowa depends on collaboration and the pooling of resources across the state. By working together, both organizations can offer patients broader access to comprehensive services, shorten the time between diagnosis and treatment for rare and complex cancers, and expand the availability of the latest therapies. This partnership reflects a shared commitment to doing what is best for Iowans.

**Denise Jamieson**, MD, MPH, UI vice president for medical affairs and dean of the Carver College of Medicine, calls it "a turning point" in Iowa's cancer treatment efforts.

A key example of how the statewide cancer network is expanding access to advanced care can be seen in the work to combine clinical trial portfolios between Mission Cancer + Blood and UI Health Care. For years, Mission has maintained a strong independent clinical trials program. Now, by aligning with UI Health Care and Holden, the organization is bringing more emerging cancer treatments and cutting-edge studies directly to patients across Iowa. The partnership builds on a shared electronic health system and has already launched its first set of joint interventional drug treatment trials for patients with large-cell lymphoma, with additional studies for other types of lymphoma, multiple myeloma, lung cancer, and breast cancer planned in the months ahead.

The combined network is expanding existing trials between the two institutions, creating new opportunities for patients to engage in leading research without needing to travel far from home. Clinical trial coordinators from both sites now work together to identify promising studies, assess feasibility, and streamline logistics, ensuring that trials can be conducted at multiple locations. By developing flexible processes that allow Mission to serve as a satellite site for certain UI-based studies, the network is reducing barriers and ensuring that more Iowans have access to the latest therapies. This partnership model not only broadens patient access but also strengthens the research itself by creating a larger and more diverse range of participants across the state.

# More Iowans are surviving cancer than ever before

Nearly 172,000 cancer survivors currently live in Iowa—about 5.4% of the population—according to the latest "Cancer in Iowa" report issued by the Iowa Cancer Registry at the University of Iowa.

Of the approximately 172,000 cancer survivors living in Iowa, here are a few who received our care:

## Scarlette Wheelock

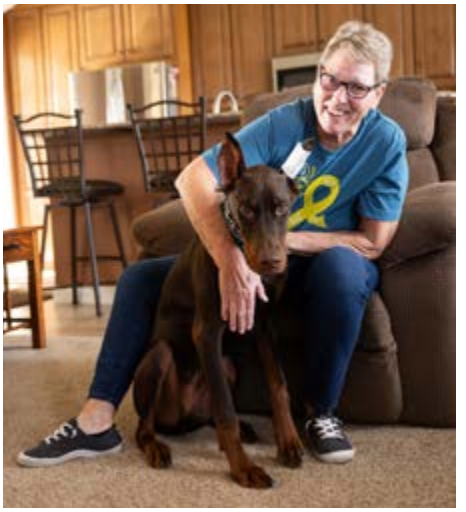
**Clinton, Iowa**
**Survivor of brain cancer**

After experiencing mysterious symptoms, a second opinion in 2022 led Scarlette Wheelock to University of Iowa Health Care Stead Family Children's Hospital, where specialists discovered the preschooler had brain cancer.

Surgery and subsequent tests of the tumor revealed that it was cancerous but had not spread. Doctors with the Pediatric Brain Tumor Clinic at Stead Family Children's Hospital — the first of its kind in Iowa and one of just a few in the United States — cared for Scarlette.

Scarlette underwent weekly chemotherapy treatments for about 14 months until July 2023. The section of the tumor that could not be removed has continued to be stable.

Since her cancer treatment, Scarlette has been able to visit Disney World, play softball and soccer, and conquer the rock wall at the trampoline park.



## Linda Jacobs

**DeWitt, Iowa**
**Survivor of breast cancer and angiosarcoma**

Linda Jacobs was diagnosed with breast cancer in 2015 and radiation-induced angiosarcoma in 2021. After conventional treatments to treat her angiosarcoma failed, Linda decided to join a clinical trial at University of Iowa Health Care.

Every two weeks, Linda received an injection of RP1, a genetically modified herpes simplex virus, into her tumor. Each injection was followed by an infusion of a monoclonal antibody to prevent cancer cells from suppressing the immune system.

As a result of the treatment, Linda's tumors shrank, and she is now cancer-free. She calls the innovative treatment "a miracle" and credits it for her recovery.

Since Linda's cancer treatment, she has been able to spend time with her grandchildren, travel to Mexico, and train a new puppy.

## Jordan Hauck

**Huxley, Iowa**
**Survivor of melanoma**

Jordan Hauck was diagnosed with stage 4 melanoma at age 27. After discovering a lump in his armpit, he sought treatment with us and found that the cancer had spread to his lungs and liver.

Jordan participated in a Holden clinical trial involving a combination of oral medication targeting the cancer's metabolic pathway and high-dose injections of a protein to help his immune system kill the cancer cells. Within a year, Jordan was cancer-free. He has had no cancer recurrence since his treatment ended in 2014.

Since Jordan's cancer treatment, he has welcomed a second daughter to their family, vacationed with his wife in Hawaii and the Caribbean, and raised more than $25,000 for skin cancer research and awareness.

IOWA HEALTH CARE | Holden Comprehensive Cancer Center

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NCI Designated Comprehensive Cancer Center

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