



2022-2023

# ANNUAL REPORT

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MASONIC CANCER CENTER

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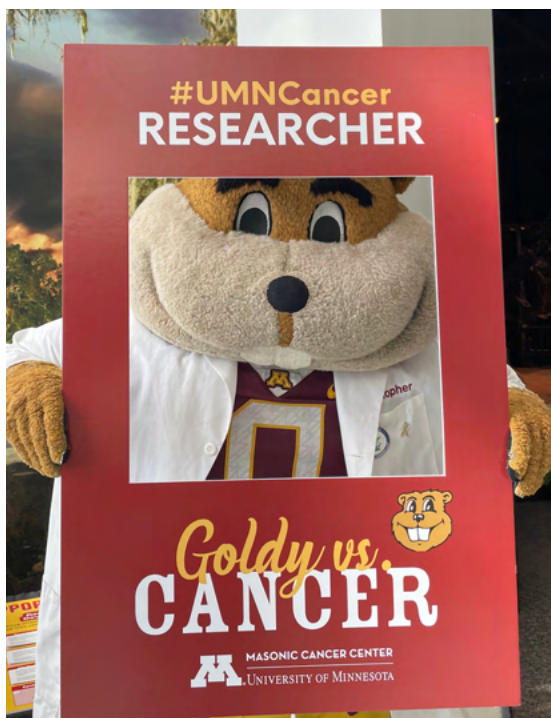
UNIVERSITY OF MINNESOTA



A Cancer Center Designated by the  
National Cancer Institute









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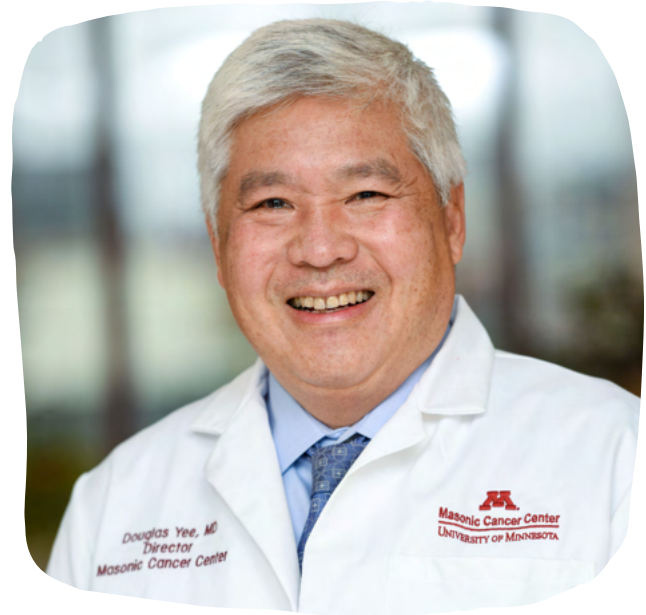
# Message from the Director

As with each year since the COVID-19 pandemic's impact was first felt, 2022 presented both challenges and incredible opportunities. What consistently brings me hope is the inspiring work being accomplished by our growing community of researchers, faculty, staff, and partners.

Thanks to our powerful partnerships, deep collaborations, innovation, and perseverance, Minnesotans continue to benefit from our influence on cancer prevention, early detection, diagnosis, treatment, whole-of-life care, and survivorship innovation and support.

In 2022, we made major progress on building a statewide clinical trials network, developing new cell therapies for cancers, and discovering fundamental properties of the immune system that can enhance existing immunotherapeutic approaches. And our plans to keep reducing the burden of cancer on Minnesotans are only getting more ambitious.

The Masonic Cancer Center has a history of driving life-saving and life-extending research, care, and policy influence—from the heart of the Twin Cities to communities across Greater Minnesota. Together with our partners, collaborators, and supporters, we are building a lasting legacy and investing in Minnesota's families and future by tackling the leading cause of mortality in our state.



Whether you're a long-time friend or supporter of the Masonic Cancer Center or a new collaborator or community member, we thank you. On behalf of each and every one of our members: We appreciate your help, support, and interest in our work—we cannot solve the problem of cancer alone.

Sincerely,

A handwritten signature in black ink that reads "Doug Yee". The signature is fluid and cursive, with the first name "Doug" and last name "Yee" clearly distinguishable.

Douglas Yee, MD  
Director, Masonic Cancer Center, University  
of Minnesota

# Our People

## Executive Committee

Douglas Yee, MD, Director

Aaron Schilz, MPA, Executive Director

Jeffrey Miller, MD, Deputy Director; Co-Leader Immunology Program

Anne Blaes, MD, Co-Leader, Screening, Prevention, Etiology, and Cancer Survivorship (SPECS) Program

Brian Betts, MD, Co-Leader, Transplantation and Cellular Therapy Program

Carol Lange, PhD, Associate Director for Basic Sciences

Christopher Pennell, PhD, Associate Director for Training and Education

Daniel Harki, PhD, Co-Leader, Cellular Mechanisms Program

Dorothy Hatsukami, PhD, Associate Director for Cancer Prevention and Control

Emmanuel Antonarakis, MD, Associate Director for Translational Research

Frank Ondrey, MD, PhD, FACS, Co-Leader, Carcinogenesis and Chemoprevention Program

Heather Nelson, PhD, MPH, Co-Leader, Screening, Prevention, Etiology, and Cancer Survivorship (SPECS) Program

Jen Poynter, PhD, MPH, Associate Co-Director for Community Outreach and Engagement

John Wagner, MD, Co-Leader, Transplantation and Cellular Therapy Program

Kaylee Schwertfeger, PhD, Co-Leader, Cellular Mechanisms Program

Lisa Peterson, PhD, Co-Leader, Carcinogenesis and Chemoprevention Program

Masato Yamamoto, MD, PhD, Co-Leader, Genetic Mechanisms Program

Melissa Geller, MD, MS, Associate Director for Clinical Research

Rahel Ghebre, MD, MPH, Associate Director for Diversity, Equity, and Inclusion

Rebekah Pratt, PhD, Associate Co-Director for Community Outreach and Engagement

Stephanie Huang, PhD, Co-Leader, Genetic Mechanisms Program

Yoji Shimizu, PhD, Co-Leader, Immunology Program

## Shared Resource Directors

Beau Webber, PhD, Co-Director, Genome Engineering

Betsy Hirsch, PhD, Co-Director, Cancer Genomics

Branden Moriarity, PhD, Co-Director, Genome Engineering

Christopher Pennell, PhD, Director, Flow Cytometry

Davis Seelig, DVM, PhD, Director, Comparative Pathology

Kenneth Beckman, PhD, Co-Director, Cancer Genomics

J. Sunil Rao, PhD, Director, Biostatistics

Jinhua Wang, PhD, Director, Cancer Informatics

John Wagner, Co-Director, Translational Therapy

Martin Felices, PhD, Co-Director, Translation Therapy

Peter Villalta, PhD, Director, Analytical Biochemistry

Timothy Griffin, Director, Proteogenomics

Timothy Hallstrom, Director, Mouse Genetics Lab



# Our People

## Administrative Team

### Administrative Leadership

Aaron Schilz  
Andrea Johnson  
Briana Kerber  
Dedra Schendzielos  
Deepa Kolaseri  
Elizabeth Kerr  
Erica Orcholski  
Kiara Ellis  
Laura Klein  
Megan Johnson  
Megan Pingry  
Marie Rahne  
Marina Sladojevic  
Susan Rottschaefer

### Administrative Staff

Amirah Muwahid	Kevin Coyle	Rose Wangen
Amna Hussein	Kyle Kummer	Sandi Wagner
Amy Nos	Larnyia Lee	Sandy Chen
Ashley Pohlenz	Laurel Nightingale	Shaneka Thomas
Bob Carlson	LeAnn Oseth	Susannah Bartlow
Brinsley Davis	Lei Simmons	Sydney Lusardo
Cathleen Drilling	Lissa Martinez Huebner	
Edie Nelson	Mackenzie Randolph	
Elsie Aldrich	Maggie Suino	
Emma Gibson	Molly Lynch	
Hannah Ford	Neela Kirankumar	
Irene Schulte	Norrie Zier	
Jessica Alkire	Patrick Moore	
Katie Manthey	Patty Beckmann	

### Clinical Trials Office Staff

Abigail Mason	Caitlynn Olson	Janet Sauers	Kylie Lydon	Ryan Maroney
Alan Denney	Carly Loewen	Janine Delage	Laura Vose	Sandra Dekoum
Aleena Rehman	Cassidy Sharp	Jazz Crosby	Lauren Matzke	Sara Crane
Aleta Stevens	Cassie Seichter	Jeena Arnachellum	Leah Schroer	Sarah Ashton
Alli Travis	Cherish Gibson	Jen Braun	Loana Ward	Shannon Lunn
Alycia Krawczynski	Colleen DeFlorin	Jenna Johnson	Lucas Brown	Shauna Eklund
Amanda Simmons	Colleen Stevens	Jessica Haines	Madison Barry	Shelly Paipal-Umland
Amy Nations	Danielle Jin	Jessica Hellmer	Manar Al-Assi	Simone Veum
Anastasia Moua	Elizabeth Kerr	Jillian Schulz	Meadow Schroeder	Skylar Mast
Andrea Hoeschen	Emalie Marion	Jonathan Curoe	Melanie Anton	Sophia Galewsky
Andrea Middendorf	Emily Marso	Jordan Marth	Merve Tekmen	Stephanie Koo
Ann Thorkelson	Erin Rogers	Jules Cadreau	Miranda Thompson	Stephanie Kowalik
Anna Babcock	Fatima Fareed	Kaitlyn Kenow	Nathan Meyers	Stephanie Soper
Anna Nelson	Hannah Heiskala	Karen Frank	Nicole Schmidt	Sven Olsen
Ashley Lyle	Heather Buckingham	Kateryna Kent	Phil Lacher	Tamara Griffin
Ashley Vogt	Helen Fagrelus	Katie Roberts	Rachael Eye	Tatum Mystic
Beth Mollen	Holly Franceen	Katie Vaughn	Rachel Buchberger	Theresa Hawkins
Bob Dickhausen	Jaime Burnes	Kayla Wagenmann	Riley Stuckey	Thomas Hexum
Brooke Roberts	Jaime Wurth	Kelsey Mullen	Roby Nicklow	Timothy Presley
Caitlyn Thompson	Janel Johnson	Kristen Arends	Roni Milgrom	Victoria Quinones

# About the Masonic Cancer Center

## Our Mission

The Masonic Cancer Center, University of Minnesota (MCC), creates a collaborative research environment focused on the causes, prevention, detection, and treatment of cancer; applying that knowledge to improve quality of life for patients and survivors; and sharing its discoveries with other scientists, students, professionals, and members of our community.

**Our mission is to reduce cancer's burden in Minnesota and throughout the world.** This mission is carried out through four priority areas: reducing the cancer burden; driving research discovery; accelerating the path to cures; and enabling research excellence.

We fulfill our mission by engaging the research strengths of the University of Minnesota to pursue multi-disciplinary population, laboratory, translational, and clinical research. We employ a diverse workforce to drive cancer research that achieves the goals of improving outcomes in cancer treatment and care, expanding our understanding of the disease and its prevention, and offering opportunities to collaborate with the greater community to benefit all.

## Our Vision

The Masonic Cancer Center is the preferred academic research hub for those seeking the best precision cancer treatment, clinical trials, and prevention measures informed by research from world-renowned experts and performed by top clinicians. The MCC attracts and retains an exceptional workforce drawn to our academic excellence, equitable and collaborative environment, and focus on nurturing and developing the next generation of cancer researchers, health care providers, and educators.

**We are part of the larger mission of the University of Minnesota:**

- Research and Discovery
- Teaching and Learning
- Outreach and Public Service



# MCC Snapshot

FISCAL YEAR 2022-23

79,610

square mileage of the area MCC serves, the state of Minnesota

10K

# of participants enrolled in clinical trials

683

# of cancer-relevant publications in peer-reviewed journals

5.7M

population of area served

26

locations serving cancer patients

\$86M

total sponsored funding

6.2K

total cancer population MCC serves

14

# of University of Minnesota colleges and schools MCC members belong to

25

years designated a Comprehensive Cancer Center by the National Cancer Institute

621

Masonic Cancer Center members (full, adjunct, and affiliate)

# Reducing the Cancer Burden

At the end of the day, the research and innovations originating from the cancer center should be driving meaningful change in our community.

Impact may be immediate or take many years, but it is a driving objective for MCC. Reducing the cancer burden is a team effort, and MCC is thoroughly committed to driving change in partnership with our community, health care providers, and other supporters and collaborators.

From early detection and diagnosis via blood testing, biopsies, and imaging like mammography, to clinical intervention, survivorship, and end of life, our team of researchers, scientists, clinicians,

educators, and community engagement professionals organizes their efforts around the patient experience.

This allows researchers and program leaders to ensure their work is firmly centered in a context that is familiar to our community.

Furthermore, our team is focused on addressing challenges unique to our catchment area—the area we serve—such as health inequalities related to local populations and environmental impact issues unique to Minnesota.



Chris Pennell, PhD, speaks with event attendees.



# Spotlight

Melissa Geller,  
Jeffrey Miller, and  
Manish Patel

## MCC begins Phase I of first-in-human clinical trial for advanced solid tumor cancers

Physicians and scientists at the University of Minnesota opened a new solid tumor cancer clinical trial and treated their first patient with HCW9218, an injectable, bifunctional immunotherapeutic developed by HCW Biologics Inc.

This Phase I, first-in-human clinical trial is enrolling patients through the Developmental Therapeutics Initiative that have advanced solid tumors with progressive disease after prior chemotherapies.

The trial is led by University of Minnesota gynecologic oncologist Melissa Geller, MD, MS, who serves as the Masonic Cancer Center's associate director of clinical research, with collaboration from Jeffrey Miller, MD, deputy director of the Masonic Cancer Center, and Manish Patel, DO, director of the Developmental Therapeutics Clinic.

"Our team is very excited to bring this clinical trial to patients who have recurrent cancer," noted Dr. Geller.



Melissa Geller, MD, MS.

"With the ease of a subcutaneous injection, this innovative compound can stimulate the immunesystem while at the same time inhibiting proteins that cause immuno-suppression."

Geller adds, "This unique combination will provide patients with cancer a novel immune-based therapy when previous treatments have failed."

The treatment, HCW9218 has an IL-15 component that activates the immune system (NK cells and T cells) and a second component that neutralizes TGF-beta, a common protein induced by tumors to suppress the immune system. As a result, this bifunctional fusion protein complex is designed to drive anti-tumor immune activity to attack cancer cells while simultaneously blocking unwanted immunosuppressive activities.

# Spotlight

## Community Outreach and Engagement

### Meeting Minnesotans where they're at

The Office of Community Outreach and Engagement (COE) at MCC works to reduce the burden of cancer in Minnesota by engaging communities and providing them access to knowledge and information about cancer prevention, early detection, treatment, survivorship and caregiving, and clinical research opportunities.

Minnesota is home to some unique populations with different cancer risks and needs. Specifically, Minnesota has the largest Somali American population in the country, the largest urban population of Hmong in the world, and 11 federally recognized Indigenous tribes—just to name a few!

"Finding innovative ways to connect with the community and share exciting research and wellness education is critical to making a real dent in the cancer burden Minnesotans bear," said Kiara Ellis, MSW, director of community outreach and engagement at MCC.

The COE team works to meet our state's many communities wherever they're at, and in terms that make sense. One example is the Fireside Chats program, which offers free, virtual sessions every month to the public on a cancer-, research-, or health-related topic presented by experts in easy-to-understand language.



COE team member Cathleen Drilling (left) speaks with attendees at an MCC event.

#### One participant said this about a January 2022 Fireside Chat:

"I attended Dr. Rahel Ghebre's Fireside Chat in January (I'm an 18-year cervical cancer survivor), and was motivated to be proactive with my health and make a long overdue visit to my primary physician. That in turn led to a referral for a mammogram and breast cancer diagnosis. Eight months, one surgery, and 20 radiation treatments later...I am here healthy. What can you say about something that impacted your life in a way that allows you to still *have* life?"







# Spotlight

Health equity in  
Minnesota

## Addressing health disparities and striving for health equity for all Minnesotans

Whether it's identifying and studying biases in cancer prevention, detection, and treatment, improving outcomes for Black women with breast cancer, tackling the increased cancer burden racial and ethnic minorities face in our state, or studying the effects of prostate cancer treatment in gay, bisexual, and other men who have sex with men, it is a top priority for MCC to acknowledge the health disparities present in the communities we serve and to implement programs that will turn the tide toward health equity.



Rahel Ghebre, MD.

### Accelerating cancer care to meet the needs of our communities

Nationally, cancer health disparities result in increasing cancer burden among racial and ethnic minorities, sexual and gender minorities, recent immigrants, and medically underserved populations, says Rahel Ghebre, MD, gynecologic oncologist and associate director of Diversity, Equity, and Inclusion at MCC.

"Better screening access for women in Minnesota for cervical cancer prevention is critical," she adds, "while we continue to deepen our understanding of effective models that expand access to cervical cancer prevention."

MCC's community engagement core is providing education on cervical cancer prevention and supporting access to cervical cancer screening thanks to initiatives like the SAGE Program.

### Breaking barriers and building trust

"For Minnesota communities, screening is an important preventative measure that can reduce disparities...

...especially closing the gap in mortality rates for breast cancer in Black women versus white women," says Dame Idossa, an MCC researcher and assistant professor of medicine at the UMN Medical School.

"Ensuring people have access to screening mammograms and can get time off work, have transportation, have childcare, etc. is crucial in allowing people to actually engage in their care and stay up-to-date with their health screenings."



Dame Idossa, MD.

# Spotlight

## Health equity in Minnesota



Andrew Venteicher (left) and Erin Marcotte (right).

### Uncovering racial disparities in surgery recommendations for patients with brain tumors

In 2022, University of Minnesota Medical School researchers, including MCC researchers Andrew Venteicher, MD, PhD, a neurosurgeon, and Erin Marcotte, MPH, PhD, assistant professor in the Department of Pediatrics and executive committee member of the Brain Tumor Program, published research in *The Lancet* showing how a patient's race may influence recommendations they receive for surgical removal of brain tumors.

According to their analysis, Black patients had higher odds of being recommended against surgical resection in the four most common brain tumors, compared with white patients.

"Racial disparities have existed historically throughout healthcare but are often attributed to socioeconomic inequities," says Andrew Venteicher, MD, PhD, an MCC researcher and neurosurgeon. He adds, "New data collection and analysis techniques allow us to look at whether bias is happening at a provider level. Clearly more work is needed to identify these biases and educate providers on how to address them."

These findings provide a foundation for future studies that will help us gain further insight into unrecognized racial bias in clinical decision-making, determine the impact of those biases on patient outcomes, and identify mechanisms to reduce those biases.





# Spotlight

Sherri Jean Katz

## Reducing youth interest in flavored vaping products

The popularity of flavored vaping products among young people has been a growing concern in recent years. A number of campaigns intended to reduce the popularity of these products have been developed as a result.

Many of these campaigns include banning non-tobacco flavors, a practice which often fails to take into account that adult smokers who want to quit smoking cigarettes are using them—including the flavored products—as an alternative form of nicotine that has lower toxicant exposure. That's why MCC researchers—led by Sherri Jean Katz, PhD, and including Ashley Petersen, PhD, Elisia Cohen, PhD, Dorothy Hatsukami, PhD, and Hanjie Liu, MA—are exploring whether changing the packaging of vaping products can reduce youth interest in them.

The study, published in *Nicotine & Tobacco Research*, sought to determine if removing the flavor image and color from vape packaging would make the product less appealing for middle school-aged young people. Researchers asked 176 young people to review different types of vape packaging and respond to questions measuring their risk perceptions, novelty perceptions, susceptibility, and behavioral intentions.



Sherri Jean Katz, PhD.

The study found that perceptions of how fun or interesting the product would be and susceptibility to vaping were highest for participants who viewed the fruit-flavored vaping product with both flavor color and image. However, the fruit-flavored product with no flavor color and no flavor image appeared to reduce the appeal of the vaping product among youth.

"It is essential to develop regulatory and public health strategies that reduce youth interest in vaping," said Sherri Jean Katz, MCC researcher and associate professor at the UMN Hubbard School of Journalism and Mass Communication.

Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health and the FDA Center for Tobacco Products (CTP) under Award Number R21CA246602.

**ESCAPE THE VAPE**

MCC also partnered with the Minnesota Department of Health for the second year in a row on the Escape the Vape Video Challenge, a PSA video contest where Minnesota 6th-12th graders can use their voices to raise awareness about the dangers of vaping.

# Driving Research Discovery

**MCC has a deep legacy of over 30 years of research innovation, and we're only getting more ambitious with the ongoing development of both our core research programs and new, developing areas of cancer research.**

To do this, we're prioritizing investments in internal research funding, such as through our Spring and Fall annual internal grant awards. In fall of 2022, MCC announced the awarding of \$700,000 in pilot grants through the fall 2022 Internal Grant Program.

The purpose of this program is to promote innovation, spark research collaborations, and support novel research concepts with the goal of answering the toughest cancer research questions. The program's goal? Fund pilot projects that lead to nationally peer-reviewed grant funding.

This year, support for the grants was made available through a variety of funding sources, including the National Cancer Institute, Minnesota Masonic Charities, and the Lyle and Gretchen Shaw Cancer Research Fund.



Lab space in the Cancer Cardiovascular Research Building, one of MCC's key research spaces on the University of Minnesota Twin Cities campus.

# Spotlight

Beau Webber and  
Branden Moriarity

## New checkpoint gene demonstrates ability to supercharge immune cells against cancer

MCC researchers and collaborators at the National Cancer Institute (NCI) investigated the role of a new intracellular checkpoint gene in regulating T-cell function against solid tumors.

Research conducted by Beau Webber and Branden Moriarity, professors in the Department of Pediatrics, Division of Hematology and Oncology, UMN, shows that the checkpoint gene, known as CISH, plays a key role in suppressing the ability of human T-cells to recognize and attack cancer cells.

In this case, the checkpoint regulates the function of T-cells, telling them to kill or not kill target cells. T-cells are a type of white blood cells that are part of the immune system. They help protect the body from infection and help fight cancer.

Webber, Moriarity, and team found that, when CISH is disabled, T-cells more effectively recognize mutated proteins produced by tumors. CISH inhibition also preserved T-cell fitness and made them more responsive to existing checkpoint therapies, suggesting a new avenue to make breakthroughs in cancer immunotherapy.



Branden Moriarity, PhD (left) and Beau Webber, MD (right).

"It is a true bench-to-bedside story that is currently being deployed in patients with metastatic gastrointestinal cancer who have exhausted virtually all other treatment options," said Webber.

The research team led by Moriarity and Webber utilized CRISPR gene editing—a process of cutting a DNA sequence to delete and insert other sequences—to safely and effectively knockout the CISH gene in human T-cells, serving as the preclinical basis for the first-in-human clinical trial using CRISPR engineered T-cells at the U of M, only the second CRISPR clinical trial authorized by the FDA at the time.

"This work is the culmination of a tremendous, multidisciplinary effort encompassing basic mechanistic immune biology, cutting-edge techniques in genome editing, and the latest advancements in adoptive cellular immunotherapy," said Moriarity.



# Spotlight

Amy Skubitz

## MCC researcher developing first diagnostic test for early detection of ovarian cancer

Ovarian cancer, often called the "silent killer," claims the lives of more than 16,000 women each year, largely due to the fact that it's hard to detect. MCC researcher Amy Skubitz, PhD, director of the Ovarian Cancer Early Detection Program at the U of M Medical School, is out to change that.

"Our ultimate goal is to develop a test that would detect ovarian cancer early, when it is treatable and the survival rate is high," said Dr. Skubitz.

In the initial discovery phase of the study, Dr. Skubitz and her team screened nearly 100 proteins for their ability to distinguish blood from 116 women with early stage ovarian cancer compared to 336 age-matched healthy women. They discovered a panel of four blood proteins that signaled the presence of early stage ovarian cancer.

More recently, they verified their results using more blood samples and published their findings in the journal *Cancers*.



Amy Skubitz, PhD.

"When we looked at the levels of these four proteins in the blood of more than 650 women, we were very confident in the ability of this test to determine whether or not the women had early stage ovarian cancer", explained Dr. Skubitz.

Currently, this panel of proteins has been submitted to the U.S. Patent Office. The researchers are hopeful that this major breakthrough can be licensed to a company that will take this panel of proteins to the next step in developing a clinical test.

The research team envisions a time when a woman can "come into the doctor's office, have a blood sample taken, and tell whether she has an early treatable stage of ovarian cancer," said Dr. Skubitz.

# Accelerating the Path to Cures

**Translating research into clinical trials and products that could create new standards of care is crucial—because it means taking ideas from the lab and turning them into potential cures.**

From increasing translation support services to providing earlier phase translation coaching and clinician-to-scientist coordination; dedicating staff to promote industry partner development

collaborations; creating a clinical trial fast track team to streamline approval processes and enroll patients sooner; or developing an innovative care provider collaboration model to optimize the patient experience, MCC is making sure new ideas move quickly and safely from concept to clinic.

## Cancer Research Translational Initiative

Drug design and development provides critical insight that informs future treatment strategies, and Masonic Cancer Center (MCC) researchers play a key role in this process—often referred to as the translational research pipeline. Translational research is conducted with the objective of using the results to directly benefit humans—making sure home-grown ideas from research laboratories make their way into clinical facilities and help patients.

At MCC, this process is facilitated by our Cancer Research Translational Initiative (CRTI) led by Drs. Emmanuel Antonarakis and Deepa Kolaseri. CRTI has facilitated the translation of TriKE GTB-3550—a cancer therapy that uses special killer cells to attack cancer cells—led by Dr. Jeff Miller. The first generation TriKE was developed to study its effects on a specific set of drug-resistant leukemias in a first-in-human trial led by Dr. Mark Juckett. Thanks to that trial, Dr. Martin Felices and team developed a more potent second-generation TriKE, and Dr. Nicholas Zorko and team have used lessons from this process to create a special TriKE dedicated to examining the response of drug-resistant solid tumors such as prostate cancer and sarcoma.

CRTI has facilitated strong partnerships with leading industry partners who have licensed the TriKE platform from the University of Minnesota and are supporting ongoing and future clinical trials.



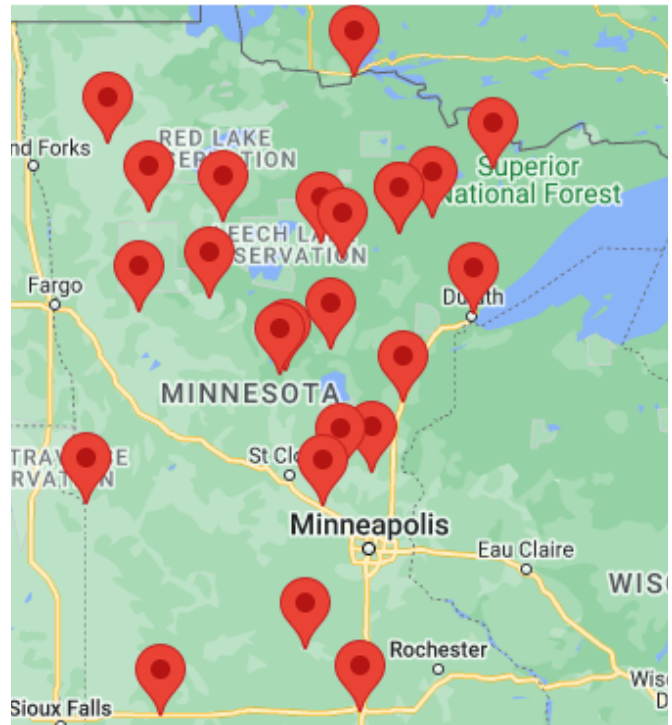


# Minnesota Cancer Clinical Trials Network

The Minnesota Cancer Clinical Trials Network (MNCCTN) aims to improve cancer outcomes for all Minnesotans through greater access to cancer clinical trials in prevention and treatment.

With one out of four Minnesotans dying of cancer, and nearly half of all Minnesotans diagnosed with a potentially life-threatening cancer during their lifetimes, it's critical that healthcare providers and patients across the state have access to cutting-edge cancer research, including cancer clinical trials.

MNCCTN's partnership with Essentia Health, M Health Fairview, Mayo Clinic Health System, Metro-Minnesota Community Oncology Research Consortium, and Sanford Health means that, as of January 2023, there are 23 different site locations in Minnesota—from the Iron Range to Worthington, to Monticello, Albert Lea, and beyond—offering cancer clinical trials to patients.



MNCCTN sites reach across the entire state of Minnesota, serving patients at 23 different clinics.

This year, MNCCTN celebrated its fifth year. The MNCCTN HUB team has grown, adding three new roles. The network also opened two new sites in Bemidji and Ortonville with Sanford Health and one new site in Baxter with Essentia Health. As of March 2023, 77 clinical trials were open, in start-up, or in development across the network, including 30 treatment trials. To date, MNCCTN has enrolled **3,816 patients** in clinical trials.





# Spotlight

## Developmental Therapeutics Initiative

### Improving access to cutting-edge cancer treatments

MCC's Developmental Therapeutics Initiative, which hosts a Developmental Therapeutics Clinic in partnership with M Health Fairview, exists to provide hope for patients, generate opportunities for faculty, and provide space for researchers to conceptualize cutting edge bench-to-bedside research.

One of the ways cutting-edge cancer treatment and care is often provided is through clinical trials. Clinical trials are studies of new medicines, procedures, and other types of treatments in people that doctors and researchers use to develop new methods of treating serious diseases, like cancer. Today's clinical trials often become tomorrow's new standard of care, boosting many patients' quality of life now, and helping ensure that future patients have continuously higher standards of care for years to come.

Driven by the overarching goal of meeting the needs of all patients, the Masonic Cancer Center, M Health Fairview, and the University of Minnesota Medical School's Divisions of Hematology, Oncology, and Transplantation and Gynecologic Oncology partnered together in 2021 to develop the Developmental Therapeutics Initiative (DTI).



The Developmental Therapeutics Clinic is housed at the M Health Fairview Clinics and Surgery Center on the UMN Twin Cities campus.

This initiative is the main mechanism by which new, cutting-edge therapies are provided to patients across the University's health system, and it's one of only two robust programs in the entire state of Minnesota. The DTI has a clinic—the Developmental Therapeutics Clinic, or DTC—housed at the M Health Fairview Clinics and Surgery Center that takes referrals from anywhere in Minnesota and is currently open two days a week.

What drove the decision to create the initiative and open the clinic? Why are Phase I clinical trials so important? And who are some of the people breaking new ground in cancer care for Minnesotans via the DTI? Let's dive in.

## Advancing today's understanding of cancer care

The Developmental Therapeutics Initiative is on a mission to create hope for patients, generate opportunities for faculty, and construct a forum for researchers to conceptualize cutting-edge bench-to-bedside research. On the clinical side, the program is geared toward patients who have advanced cancer and who have already received standard treatments that have not worked. Typically, these patients are also lacking new options—in other words, there are few to zero standard treatment options left available to them. That's where Phase I, or early-phase, therapeutic cancer clinical trials come in.

"We've identified that there is a large need for early-phase trials for a substantial portion of our patients," says DTI Medical Director, Dr. Manish Patel, associate professor of medicine for the Division of Hematology, Oncology, and Transplantation at the U of M Medical School and a member of the Masonic Cancer Center. "The DTI provides structure via a team of people who all have expertise in running early-phase clinical trials and are able to match each patient with a novel, or new, therapy that we have available," says Dr. Patel.

Early-phase clinical trials are usually the first that involve people. These trials take promising results from lab research and test the new treatments in patients, evaluating whether they are safe for patients and finding out what dosage(s) work best without causing severe side effects.

"Phase I trials are for drugs that have been tested in the lab and look very promising," says Patel. "But taking it to the patients is very different. What we've observed in the lab may work for them, but we have to be very clear that we don't know for sure that it will. For these trials, we don't yet have enough data to give definitive answers—it's from these trials that we get that data and are able to develop the next generation of standard therapeutics."

Dr. Patel adds, "Of course, we hope that the patients who are participating will directly benefit from these new therapeutics. But the patients themselves are also giving back to the greater good by contributing to our understanding of how these medications work for the benefit of future patients."

At the clinic, Dr. Patel uses his extensive experience running early-phase trials to direct the DTC team. Patel leads team meetings, where staff members consisting of clinical research coordinators and registered nurses discuss what protocols, or trials, the clinic should open, as well as the science and feasibility of each to garner consensus about which trials they should run. Patel also helps to manage the patient care for patients enrolled in the clinic's trials.

Loana Ward, clinical director for the DTI, who manages the team of clinical research coordinators and registered nurses, notes, "The patient population we work with is such a sensitive group. Sometimes, a patient is deciding between a trial, which may prolong their life, or no treatment at all. The way our providers talk with each patient and walk through what their options are is really powerful. The weight of these options is very heavy."

Loana adds, "Everyone on our clinical team treats every protocol like it is *the one*, and really invests in each one. Our team knows just how crucial these trials are, both for today's patients and for future patients, so we appreciate the innovation and life-saving potential of each protocol that comes our way."

Dedra Schendzielos, MHA, executive director for clinical research at MCC who oversees the Clinical Trials Office and the DTI team, adds, "Phase I research plays such an important role in the clinical and translational research process; testing the safety, dosing, and timing of new therapeutics is critical in contributing to ongoing and future research."

"The patients that participate in these trials are making important contributions to science while also doing everything they can to prolong their lives."

## Looking to the future

Currently, the team consists of seven faculty members and an advanced practice provider, or APP, and a team of research nurses and coordinators. Compare that to how the program started out, and it's clear that the initiative has grown quite a bit in the past few years.

Noting the collaborative nature of the program, Loana points out: "This team as a whole is unique, because it brings together so many different specialties—and that is different from a lot of other groups. Because our investigators come from a variety of specialties, we can treat many patients with different types of cancer."

The trials are considered multi-disease, or basket, trials, in which the team is learning which diseases a drug might work in. "For example, I might see a breast cancer patient even though I don't have expertise in breast cancer because we're trying to understand how to apply these drugs in different diseases and different types of cancer," says Dr. Patel. "It's very much an interdisciplinary team and process, and we always go back to the patient's primary oncologist and discuss with them what specific trials we have available and where they might fit in that patient's care. We work hard to keep the patient's primary oncologist involved and engaged in this phase of the patient's care as much as we possibly can."

"Looking forward, our main goal is to grow the program," says Dr. Patel. One of the difficulties of Phase I research, Patel explains, is that the trials themselves often have limited slots to offer patients treatment. "You want to have at least 10-15 studies happening at the same time to ensure there are enough treatment slots for each

patient that comes your way. Over the next five years, we want to have 30 active protocols at a given time, and we aim to accrue around 100 patients a year onto Phase I trials," says Patel.

To accomplish those goals, the team will have to continue to expand its staff, adding critical capacity that supports the cancer center's goal of improving its ability to translate innovative science into the clinical space.

Patel notes that "The hope is that a significant portion of our portfolio will be local science with U of M investigators developing the protocol and having it come from our scientific community at the University and at the Masonic Cancer Center."

The team notes that they've been in early discussions about creating a forum for basic scientists to vet their ideas, helping them find the right space to translate their research discoveries into clinical trials where they can help patients now and for generations to come.

Patel, Ward, Schendzielos, and team are also excited about reverse translation, where insight gleaned from patient interactions is taken back to the laboratory. "It's an iterative process," says Dr. Patel. "We learn something from a Phase I trial, and then we take it back to the lab, answer questions, and bring it forward to a clinical trial again."

All of us here at MCC believe collaboration—between patients, clinicians, and researchers—is the best way to accelerate the discovery and development of breakthrough cancer treatments. As the DTI grows, widening the scope and deepening the impact of the cancer center's clinical research in Minnesota and beyond, each new trial brings new hope in our pursuit of new cures for cancer.



# Spotlight

## Killebrew Thompson Memorial Fund



## Taking a swing at cancer

### The Killebrew Thompson Memorial Fund

Every August since the summer of 1977, the Killebrew-Thompson Memorial (KTM) in Sun Valley, Idaho, has gathered hundreds of individuals over the years, including celebrities, members of Congress, professional athletes, corporate sponsors, other participants, and volunteers around one common goal: finding a cure for cancer.

The tournament was founded by baseball Hall of Famer Harmon Killebrew and Congressman Ralph Harding in memory of Minnesota Twins shortstop Danny Thompson who died of leukemia at the age of 29. Through their hard work and the dedication of their supporters, the KTM is now considered one of the leading cancer research fundraisers of its kind.

To date, the Killebrew-Thompson Memorial Fund has generously provided MCC with nearly \$11 million in support.



Jakub Tolar (left), dean of the U of M Medical School and vice president of Clinical Affairs, accepts a check from KTM alongside KTM board members and MCC member Brenda Weigel (third from right) in June 2023.

# Spotlight

Jaime Modiano,  
Daniel Vallera, and  
Antonella Borgatti

## Teaming up for treatment: Advancing cancer research in humans and animals

In 1999, one of Al and June Perlman's beloved poodles was diagnosed with a fast-growing melanoma. The Perlman's poodle received treatment at UMN and prompted a unique partnership between veterinarians at the College of Veterinary Medicine (CVM) and cancer researchers at MCC.

The partnership launched a series of vital research programs and therapies, both for pets and the humans who love them. The most noteworthy collaboration revolves around a drug called eBAT utilized by the labs of Jaime Modiano, director, Animal Cancer Care and Research Program, CVM, and Daniel Vallera, professor of radiation oncology at MCC—thanks to the curiosity of former Modiano Lab Fellow Jill Schappa, who is now an assistant professor of clinical pathology for CVM.

eBAT is a biological drug that enters the body in search of two targets. In healthy organs, these targets are found in separate places; when they're found together, they're *only* found in highly malignant tumors—including one called hemangiosarcoma, a cancer that forms when the cells that normally build blood vessels go rogue.



Jaime Modiano and Antonella Borgatti pose with canine patient Valky.

By attaching to these targets only when found together, eBAT can identify cancer and anchor itself to the tumor to release a genetically-engineered toxin that kills the tumor cells.

Part of the innovation of eBAT's design is that it is also able to disrupt the environment that the tumor cells need to thrive. That means that, even if some of the tumor cells evade the drug, they will no longer find a hospitable environment in which they can grow.

CVM-MCC researchers took this groundwork and ran with it, looking at innovative ways to use the treatment method on cancer in humans and dogs.

"We've been investigating new therapies and different chemotherapy combinations to see if the outcome can be improved," said Antonella Borgatti, professor of oncology for CVM. "This was a breakthrough treatment," she adds, one that wouldn't be possible without the partnership between human and veterinary medicine.

# Spotlight

Stefani Thomas

## Providing insight into ovarian cancer treatment—before the treatment even starts

Ovarian cancer is the eleventh most common cancer and fifth leading cause of cancer-related death among women, making it the deadliest of gynecologic cancers. MCC researcher Stefani Thomas is focused on giving doctors better insight into how particular patients will respond to particular treatments.

In 2022 alone, there were at least 300 new diagnoses of ovarian cancer in Minnesota. Researchers are uncovering new targeted treatments that help many patients, but nearly three-quarters of women with advanced ovarian cancer will still relapse within five years.

Typical treatments for ovarian cancer involve doctors examining the genes within a tumor to match patients to whichever drug is most likely to work for their particular tumor—with no way of knowing whether the patient might develop a sensitivity or resistance and have to be switched to another therapy.

Stefani Thomas, MCC researcher, clinical chemist, assistant professor in the U of M Medical School Department of Laboratory Medicine and Pathology, and associate medical director of the U of M West Bank Laboratory, is studying protein expression to better predict treatment sensitivity and resistance for patients with ovarian cancer.



Stefani Thomas, PhD.

Protein expression refers to the production of proteins by cells. Studying it in cancer cells can help researchers gather information about a specific type of cancer, the best treatment to use for it, and how well a particular treatment works.

“Proteins are the primary molecules responsible for carrying out biological functions,” Thomas said. “This is an exciting time because advances in proteomic technologies such as mass spectrometry are allowing us to discover new insights into the mechanisms of human health and disease, including cancer.”

The work could eventually lead to a blood-based diagnostic test that lets doctors use a patient’s protein profile to determine their likelihood of responding to a certain drug or combination of treatments. This could help patients avoid wasting critical time—and suffering unnecessary side effects—in an extensive trial-and-error search for the right treatment.



# Enabling Research Excellence

Addressing the cancer burden through research, community programs, and clinical trials requires a solid foundation to drive success. MCC's commitment to enabling research excellence drives every other facet of our work: from reducing the cancer burden, to accelerating the path for cures, and driving research discovery.

This foundation of research excellence is achieved through a number of different priorities, including engaging the communities we serve, further embedding diversity, equity, and inclusion into our recruiting pipeline and internal representation, promoting cancer career growth and development, and actively building and nourishing partnerships with key stakeholders across the state of Minnesota. Most importantly, this foundation would not be achievable without the generous support of our donors, supporters, and collaborators.

Thank you to each and every person and organization who champions the work of the cancer center, whether it be financially, within the community, at the legislature, on social media, or with neighbors and loved ones.

We've said it before, and we'll say it again: Solving the problem of cancer is a collaborative effort. We could not do this work without you. Thank you for your ongoing support of the Masonic Cancer Center.



A sign depicting the new name of the cancer center, Masonic Cancer Center, is unveiled by Director Douglas Yee, MD, at a 2008 ceremony.

## A legacy of generosity: Minnesota Masonic Charities

Since 1955, Minnesota Masonry has partnered with the University of Minnesota to eradicate cancer. Together, Masons, Stars, and Minnesota Masonic Charities have invested nearly \$100 million in the Masonic Cancer Center, University of Minnesota (MCC) since the center's inception. Minnesota Masonry has been a critical supporter of MCC's continued legacy of ambitious, innovative cancer research and patient care for those seeking the best precision cancer treatment, clinical trials, and prevention measures informed by research from world-renowned experts and performed by top clinicians.

In April 2008, Minnesota Masonic Charities presented the University of Minnesota with an extraordinary gift of \$65 million—the largest gift ever made to the University—to continue seeking the cure for cancer. In recognition of the gift, the University's cancer center was renamed to Masonic Cancer Center, University of Minnesota. Over the years, Minnesota Masonry has continued to generously support cancer research and patient care.

**Thank you** to Minnesota Masonry for their generous support of MCC over the years. Solving the problem of cancer is a collaborative effort—and Minnesotans from across the state have access to more innovative, advanced, high quality care because of this giving legacy.



# Spotlight

Dorothy Hatsukami

## MCC research influences FDA proposal to lower nicotine levels in cigarettes

**A decades-long collaborative research effort that determined a lower dose of nicotine in cigarettes led to a reduction in cigarette smoking, exposure to carcinogens, dependence, and an increase in attempts to quit finally paid off.**

Led by Dorothy Hatsukami, associate director of Cancer Prevention and Control and professor in the UMN Department of Psychiatry and Behavioral Sciences, and with co-principal investigator Eric Donny of Wake Forest University, the research helped lead the Food and Drug Administration (FDA) to look at setting a maximum allowed nicotine level in cigarettes—and potentially other smoked tobacco products as well. The proposed FDA rule would significantly reduce smoking related cancers, death, and disease and could be announced in the fall of 2023.

"Reducing nicotine in cigarettes will prevent future generations from becoming addicted to smoking and help smokers quit smoking more easily," said Hatsukami. She adds, "It has been estimated that over eight million lives could be saved from tobacco-caused death by the turn of the century."



Dorothy Hatsukami, PhD.

Hatsukami's leadership on this effort began back in 2009, when she convened a meeting of tobacco control researchers, policymakers, and government agencies to assess the feasibility of reducing nicotine in cigarettes as a national policy measure.

The University of Minnesota has long been a leader in tobacco research, with previous studies that characterized nicotine dependence and developed effective quit-smoking treatments and contributed to an indoor smoking ban in Minnesota in 2007.

As the founding director of Tobacco Research Programs (TRP) at the U of M, Hatsukami has helped lead the TRP team of faculty from Medicine, Family Practice, Psychiatry, MCC, Pharmacology, Epidemiology, Journalism, and Mass Communications to study how best to combat the tobacco crisis facing the U.S. and the world.

# Spotlight

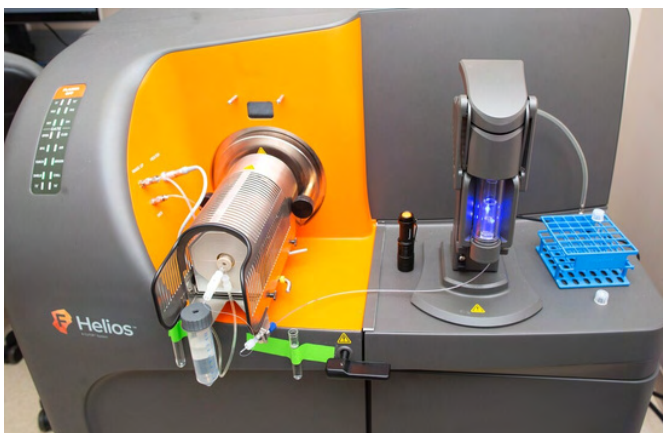
Martín Felices and  
John Wagner

## Better cancer therapies, faster than ever before

**New lab equipment is accelerating researchers' progress toward making cancer immunotherapies available to more patients.**

Directing a person's own immune system to fight off cancer once seemed like only a distant hope. But, today, there's a new piece of equipment that's accelerating researchers' progress toward making immunotherapies available to patients of all ages and increasing the cutting-edge technology offered by MCC's shared resources.

The Helios Mass Cytometer at the U's Institute for Cell, Gene, and Immunotherapy (ICGI) sounds like the stuff of science fiction. Helios uses special software to generate a mind-boggling amount of high-quality, comprehensive data that can inform researchers about which cancer therapies are working, which aren't, and why—and fast.



The Helios mass cytometry machine.



Martín Felices, PhD.

In short, analysis that used to take weeks now takes one or two days, streamlining movement of immunotherapies from the lab to the clinic, where they will improve cancer patient lives," says Martin Felices, PhD, co-director of MCC's Translational Therapy Shared Resource. "We're using this extremely powerful, leading-edge tool to push forward brand-new immunotherapies and to understand how they work," he says. "We're going to leverage that information to change and optimize our therapies and move forward faster."

Funded with a gift from Fritz and Glenda Corrigan, this sophisticated machine—about the size and shape of a large office copier—was installed last spring. Since then, it's been ramped up for use in numerous studies, many involving post-transplant evaluations that compare samples from blood and marrow transplant recipients in remission with those facing persistent disease.

This story has been adapted from the original version authored by Karin Miller for the University of Minnesota Foundation's Spring 2022 edition of Discovery magazine.



# Spotlight

Institute for Global Cancer  
Prevention Research

## Innovative global impact: Improving lives and driving change

**Worldwide, people from under-resourced communities experience higher exposure to cancer risks and do not have access to cancer screening and other preventive measures. The Institute for Global Cancer Prevention Research (IGCPR)—a program of MCC, the UMN Medical School, and the UMN School of Public Health—exists to change that.**

Led by Director Irina Stepanov, PhD, IGCPR is addressing this issue by establishing partnerships around the world and building capacity for multidisciplinary translational cancer prevention research both at the University of Minnesota and globally that informs cancer prevention practices and policy-level change.

The U of M is known around the world for its unique depth of expertise and landmark contributions to tobacco control; IGCPR's researchers work on sharing this expertise and establishing the capacity for product testing and biomarker research in India and other countries with high prevalence of tobacco use to support local tobacco control and tobacco use interventions.



Irina Stepanov, PhD.

IGCPR is developing a new translational exposure assessment resource, which includes a new state-of-the-art tobacco testing laboratory at UMN that will support research ranging from the chemical analysis of tobacco product emissions, to studies in cells and laboratory animals, to human trials of product use, and innovative biomarkers of exposure and health outcomes.

The Institute also provides seed funds to establish new partnerships in low- and middle-income countries. Currently, IGCPR is funding two seed grants led by U of M faculty: one in Ghana aimed at understanding the barriers to and facilitators of cervical cancer screening, and one in Uganda seeking to identify innovative approaches to increase cervical cancer screening—research that will inform screening and prevention measures in communities across the world, including immigrant communities in Minnesota.

IGCPR is committed to enabling systems-level change that uses systematic research, evidence-based practices, and bold policy change to prevent cancer for people across the globe.

# MCC Grants Snapshot

FISCAL YEAR 2022-2023

Area of research funded	Number of awards	Total amount invested
Translational Research (from lab to clinic)	4	\$300,000
Women's Cancers	2	\$150,000
Colon Cancer	1	\$25,000
Pediatric Cancer	1	\$50,000
Sarcoma	1	\$50,000
Junior Faculty Research*	2	\$80,000
Interdisciplinary Cancer Research**	2	\$200,000
Community-Engaged Research	2	\$200,000

\*These ACS-IRG grants support junior faculty in initiating cancer research projects so they can obtain preliminary results that will enable them to successfully compete for national research grants.

\*\* These pre-R01 brainstorm awards foster interdisciplinary cancer research projects, with the ultimate goal of obtaining new R01s (or equivalent) from federal sources.

## Recipients

Emmanuel Antonarakis  
 Anne Blaes  
 Zuzan Cayci  
 Julia Davydova  
 Erin Dickerson

Justin Hwang  
 Do-Hyung Kim  
 Christopher LaRocca  
 Jeffrey Miller  
 Jianfang Ning

Julie Ostrander  
 Erica Timko Olson  
 Rebekah Pratt  
 Zohar Sachs  
 Subree Subramanian

Vivek Verma  
 Rachel Vogel  
 Jinhua Wang  
 Ivan Wu

# Spotlight

University of Minnesota  
Foundation

## Scott's strength: How a genetic discovery empowered Scott Nelson and his family to take on cancer

On a summer Friday in 2004, Scott Nelson visited his doctor for a routine check-in.

The visit was smooth sailing, until a scan revealed a large, cancerous tumor on Nelson's pancreas. He was diagnosed with Stage III pancreatic cancer, and unless his tumor shrank, surgery would be impossible.

Through a series of referrals, Nelson found his way to M Health Fairview hematologist and oncologist Edward Greeno, M.D., now the medical director of the Masonic Cancer Clinic. Greeno was spearheading a clinical trial for patients just like Nelson at the Masonic Cancer Center, University of Minnesota. The clinical trial involved an intensive chemotherapy regimen to shrink Nelson's tumor to the point where the cancer could be surgically removed.

Nelson's cancer stemmed from a genetic mutation known as BRCA2, which is associated with an increased risk of certain hereditary cancers. Luckily for Nelson, BRCA2 cancers are also susceptible to the particular chemotherapy drug that was part of his clinical trial, a link that was unknown at the time.



Pancreatic and prostate cancer survivor Scott Nelson. Photo/Erin Benner.

Nelson's diagnosis prompted his seven siblings and their children to embrace genetic testing and early cancer screening. There have been eight cancer diagnoses among family members with the mutation, and all have survived due to early detection through genetic testing and regular screenings.

"[When you've beaten cancer] you know that there is always hope, regardless of the severity of the diagnosis," Nelson says.

Leading-edge clinical trials—like the one that saved Scott Nelson's life—are fueled in part by philanthropy. **Make a gift to support Masonic Cancer Center research at [give.umn.edu/giveto/cancer](https://give.umn.edu/giveto/cancer).**



Scan the code with your phone camera to read the full story originally authored by Zach McCormick for the Spring 2023 edition of Discovery magazine.







# Thank you for your ongoing support of the Masonic Cancer Center.



## Credits

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Hannah Ford

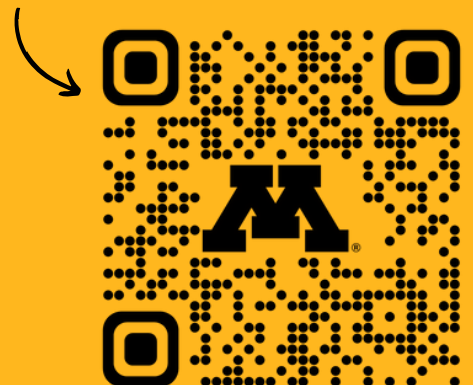
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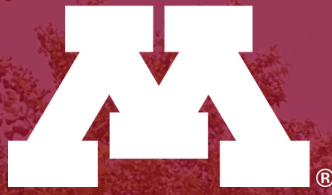
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