Tomorrow’s Cures Today
With the help of philanthropic support, life-changing research offers patients hope at Swedish.
Through clinical trials, we can offer the treatments of tomorrow to our patients today.

Our physicians and research teams are dedicated to pushing the field of medicine forward for the benefit of their patients—and patients everywhere. From cancer immunotherapies to new drug options for multiple sclerosis, clinical trials have the potential to change lives for the better.

Your gift to research at Swedish is a gift of hope for a healthier tomorrow.

Thank you.
Unlocking the mysteries of cancer
How technology is powering the next innovations in treatment

The pace of research has picked up at Swedish, due in part to the headway at the Paul G. Allen Research Center at Swedish Cancer Institute. With new clinical trials underway in the Phase 1 lab, a next-generation lab is in the works and investigator funds being awarded, the Center—which opened in 2021 thanks to the generosity of the Allen Cornerstone Gift—is gaining momentum.

With a focus on physician-led clinical research, the Center has a single goal—to revolutionize cancer care but not just for our community, for patients everywhere. Using a collaborative model, the Center was created around three pillars of discovery: the Initiative for Molecular and Genomic Evaluation of Cancer, the Center for Immuno-oncology and the Initiative for Cancer Prevention and Early Detection. Together, these pillars work to better understand, treat and prevent cancers.

Kelly Paulson, M.D., Ph.D., heads the Center for Immuno-oncology (CIO). The CIO’s mission is to help develop and test leading-edge immunotherapies to improve cancer treatment. Immunotherapy treatments can teach the body’s immune system to attack cancer and supercharge the ability of the immune system to fight the disease. Advances in immunotherapy are key to developing long-lasting treatments for advanced cancers.

In 2022, Dr. Paulson and her team opened the CIO and began seeing patients at First Hill. As part of its role with the Swedish Cancer Institute, the CIO provides patients with greater access to specialized and personalized leading-edge care.

“At the CIO, our goal is to use the immune system to cure cancers in more patients,” said Dr. Paulson. “We know we can cure certain cancers in some patients, but it’s not nearly enough.”

Understanding who an immunotherapy works for and who it doesn’t work for and then how to improve that treatment for patients is crucial. Thanks to your support, we continue to uncover cancer’s secrets. A few of the studies the immuno-oncology team is currently shepherding include:

- Krish Patel, M.D., Director of Lymphoma Program and Director of Hematologic Malignancies and Cellular Therapy at Swedish Cancer Institute is studying the response of the immune system to two different
conditioning regimens used to treat blood cancers such as leukemia, lymphoma and multiple myeloma. Dr. Patel has made major contributions to new therapies and treatment standards in recent years and is looking to expand that knowledge with this study.

- **Adam Bograd, M.D.**, thoracic surgeon, is examining the relationship between neoadjuvant immunotherapy response and the microbiome in treating lung cancer.
- **Charles Cobbs, M.D.**, neurosurgeon at the Ben & Catherine Ivy Center for Advanced Brain Tumor Treatment, is using CIO support to study the impact of novel immunotherapy approaches on glioblastoma, the most aggressive brain cancer. This trial is using a novel glioblastoma cell culture developed by the Ivy Center.
- Across the CIO, we are running multiple active phase I immunotherapy trials including studies of bispecific antibodies (“BiTe’s”) for advanced lung cancers, and studies of novel immune checkpoint inhibitors for gastrointestinal, gynecologic, breast, ovarian and advanced skin cancers. This work builds on Swedish Cancer Institute’s rich clinical trials portfolio, led by Philip Gold M.D., Director of Clinical Research and Program Leader for the Gastrointestinal Oncology Program, with more than 60 active therapeutic trials.

**Technology’s Role**

Advances in technology and advances in medicine are inextricably linked. Take, for example, something as simple as storage. The Center’s lab is now equipped with the latest generation of liquid nitrogen fed vapor phase cryogenic freezers. These freezers allow Swedish researchers to store tumor tissues more efficiently so that they can be studied over time. Long term study of tumor tissues provides greater insight into the efficacy of treatments.

Leading-edge technology is also available to study cells in new, more comprehensive ways. As Dr. Paulson looks to deepen our knowledge of solid tumor cancers, she is exploring how cells within the body interact. Until recently, this type of study has been painstaking and time consuming as the traditional technologies used to examine cells had limited capabilities.

Thanks to donors like you, we now have a spectral flow cytometer that is in use at the Center’s lab. The addition of this machine has ushered in a more effective and efficient method of studying tissue samples. The machine uses fluorescence to analyze individual cancer cells, looking for biomarkers that help identify cancer cells and other cells in the tumor. This new technology allows researchers to look for dozens of markers in the same sample, saving time, money and precious tissue samples.

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Kelly Paulson, M.D., Ph.D., and Krish Patel, M.D., are researching new therapies and treatments for solid tumor cancers.
Our next goal is to add spatial multiplex immunohistochemistry (smIHC) capabilities to the lab, a mouthful of a term that will complement the spectral flow research already happening. smIHC helps researchers study cancer cells within tissue samples more efficiently. It allows them to look at multiple proteins or molecules in the cells simultaneously to better understand the characteristics and behavior of cancer cells within the tissue and how different cells interact with each other. smIHC also allows us to see the tumor as an ecosystem of cells living together. Including understanding which cells are next to each other and how they might be using these proteins to influence the behavior of another cell nearby.

As cancer grows, it accumulates mutations and other alterations that change how genes are expressed. These changes can be seen in tumor proteins that are slightly different from their counterparts in healthy tissue. It is these proteins (cytokines), both cancerous and healthy, that Dr. Paulson is tracking with fluorescent markers.

Cytokines are the signals that cells use to talk to each other and observing them allows us to understand how the immune system is shifting. Is it shifting to fight the cancer cells? Is it shifting in the direction of inflammation? By applying smIHC, researchers can study cytokines in cells and tissues, gaining insights into their role and impact on immune responses and disease processes.

New technologies provide valuable information about cancer cells by focusing on different pieces of the puzzle. Spatial multiplex IHC allows researchers to see the location and relationships of molecules within tissue samples, while spectral flow cytometry focuses on analyzing individual cells and measuring the presence of specific molecules on their surface.

“With these technologies, we are no longer just looking at a part of the problem,” said Dr. Paulson. “We are seeing all of the interactions of all of the immune cells together as they work to fight the cancer. We are seeing what is working and what isn’t so that we can understand successful immune responses.”

Together, these methods will help propel Dr. Paulson’s work. Allowing her to develop new insights into solid tumor growth and treatment with a particular eye on how immunotherapies can be created to effectively combat cancers for more patients. This knowledge will help her refine immunotherapies for large populations of patients and eventually, specific individuals.

“The grief we feel as physicians having a treatment that we know can cure, like immunotherapy, but right now can only cure some people—it’s painful. But that pain also propels us forward,” said Dr. Paulson.

Thanks to your ongoing support, at the Paul G. Allen Research Center at Swedish Cancer Institute, Dr. Paulson and her colleagues continue to push the boundaries of immuno-oncology in the hopes of providing every patient with the ability to use their own immune systems to fight, prevent and cure cancers.

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**SPATIAL MULTIPLEX IMMUNOHISTOCHEMISTRY**

To effectively study a disease, it’s critical to see as clear a picture of what’s happening in the body as possible. Spatial multiplex immunohistochemistry (smIHC) is bringing researchers one step closer to that big picture view.

smIHC is a new method that can simultaneously detect and visualize many proteins within the same tissue sample. This technique uses different colored fluorescent tags that bind to specific proteins. By using different colors, scientists can see which proteins are present and where they are located within the tissue sample.

Why does this matter to cancer research? When smIHC is applied to cancer immunotherapy research, it allows researchers to study the immune response within tumor tissues in a more comprehensive way. By analyzing multiple proteins simultaneously, researchers can identify immune cells, checkpoints, and other factors involved in the immune response to cancer.

This information helps us understand why some patients respond well to immunotherapies while others do not. Information that will help us develop personalized and more effective treatments that harness the power of each patient’s immune system to fight their cancer.
Unlocking the mysteries of multiple sclerosis

A special combination of people power, technology and philanthropy meets the challenge with good medicine.

How does the Swedish Multiple Sclerosis (MS) Center know that singing benefits patients with MS? It’s one of many points of knowledge gained because of the way the center nurtures human potential. Whether it’s a new class, adventure or treatment, led by patients or staff, the philanthropy-supported center gives people the license to try.

“Imagine having difficulty using your voice to speak and then having a teacher that has exercises that allow you to actually sing,” says Diane Baumgart, who’s been coming to the center since 2021. “It’s uplifting and I end every class feeling incredibly happy.”

“It’s gratifying to seize an opportunity and make the best of it,” says James Bowen, M.D., medical director and leading visionary of the MS Center at the Swedish Neuroscience Institute. His thirty years of experience in MS care and research include his leadership in creating and growing the center which celebrated its 10-year anniversary last year.

MS disrupts communication between the brain and the body, and its puzzling variability and manifestations continue to keep Dr. Bowen up at night. While it impacts more people between the ages of 20 and 40, MS can appear at any age, with symptom patterns and severity varying widely. The disease is more common in certain geographies and demographics, although those trends are also shifting over time. To date, there’s no known cure.

Currently, the Pacific Northwest has one of the highest rates of MS worldwide. The center has grown over the past decade to monitor more than 4,000 patients a year, providing
coordinated care across a range of medical specialties. The center is specifically designed to meet the needs of patients living with MS. It offers vocational support, social services, an adventure program, neurocognitive support and a wellness program, including support groups. It’s also a leading place for clinical trials and research.

“The MS center offers people an environment in which they feel whole, and where they feel included,” says Patty Padden, who’s been coming to the center since 2012. “We have a program called Get Back Your Music and there we are, playing rock and roll in the conference room!”

“I know I’m not destined to be a great writer, vocalist, or amazingly physically fit adult, but I receive professional instruction and guidance to be myself and be excellent at that,” says Diane.

“When I first got into the field, no treatments existed for MS, and now there are 19 FDA-approved drugs,” says Dr. Bowen. “Our team participated in research studies for 14 of the 19. We’ve been right there in the thick of it with bringing these new treatments to market. At the same time as doing research, we’re trying to address more human aspects of the disease with the center’s programming.”

**Stem-cell research, powerful partnerships and novel ideas**

In research, this combination of people power and technology has led to one of the most promising advancements in MS treatments to date. A partnership between the Swedish MS Center and the Cleveland Clinic, the University of Washington, and the Fred Hutchinson Cancer Center is now in the third and final phase of a clinical trial called BEAT-MS. The trial aims to prove that stem cell transplants can help stabilize MS in around 70 percent of people—if performed early in the disease’s course. “Our findings have enormous potential because the preliminary data from the phase 2 study showed that this may be twice as effective as our most aggressive standard therapy, potentially giving patients better options,” says Dr. Bowen.

Without researchers collaborating across institutions, this new direction wouldn’t have been possible. “It’s never one lone scientist working away and coming up with a brilliant strategy. Rather, these efforts often require many different people, usually at different institutions,” Dr. Bowen says. “Stem cell research is a good example of that. We’ve been working on this for about 20 years. It started when a group at Fred Hutch came to me with this idea. They had transplant expertise, and I was a neurologist who knew nothing about transplants. We need expertise in all these areas.”

Another partnership area involves using artificial intelligence (AI) to extend researchers’ brainpower. The center’s Pavle Repovic, M.D., leads the collaboration with the Institute for Systems Biology (ISB) to try to find answers by looking at large datasets. “Seeing 4,000 patients per year with records going back eight years now, the hope in reviewing this data is to understand what might make MS more or less aggressive,” says Dr. Bowen.

Then there’s the practice of exploring novel ideas. For example, it’s been known for decades in the MS world that pregnant women have fewer MS attacks, and that the disease becomes more aggressive in the three months after giving birth. Figuring out why this occurs may unlock new treatment options.

Similarly, the center’s programming provides more opportunities to expand on the existing knowledge base. Learning that weekly music therapy with vocal exercises and singing provides clinical benefits is a perfect example. “We’ve been hearing from primary care providers noticing huge improvements with swallowing and speech issues,” says the center’s program manager, Erin Carper.

How the place feels also matters. “The vibe is friendly, welcoming and comfortable,” says Patty. “Sometimes, after an appointment, I want to linger for a few minutes and take a 10-minute cat nap. At
We want our people having fun.” That’s the mandate of Swedish Multiple Sclerosis Center leader Dr. James Bowen for its Adventure Program. The program continues to enhance the center’s work in combining the best that healthcare and humanity can offer.

Catering to diverse abilities and interests, program guide Simon Gale organizes activities throughout the year, including snowshoeing, skiing, kayaking, cycling, art classes and more. The program meets people where they are and supports not feeling defined by a diagnosis. It’s costly to provide transportation, food and to collaborate with service providers. Philanthropy helps to make these experiences as fun and satisfying as possible. “It was magic watching them slip into the lake,” Gale says of one of the kayaking events. “There were people in the water and onshore, eating sandwiches and talking about MS — or not talking about MS.”

See what one participant’s skydiving experience means to them at swedishfoundation.org/skydiving.

Positioned for progress
Erin describes the success of another effort, a patient-led creative writing group. It began in March of 2020, suggested by a husband-and-wife team who both had related career experience, one as a professor and the other as a published author. And while the pandemic immediately disrupted the in-person writing groups, it continued online and ultimately became a transformative community and experience for all involved, resulting in a published book.

“The writing class is amazing,” says Diane. “It’s about more than just the past. It’s about living life and discovering more about ourselves.”

“Listening to patients and letting our facilitators do what they do best is rewarding,” says Erin. “Dr. Bowen is a great leader who understands that you never know what will work. We’re always hearing patients and listening to what we can try, seeing what’s out there, giving facilitators space to develop themselves and develop programs.”

This all-embracing approach makes the Swedish MS Center a leader in the community. “Last fall, we had people from different clinics across the country shadowing providers and sitting with me for a week to look at the work we’re doing,” Erin says. “They saw how comprehensive our work is and how philanthropy supports what we do. We’re now acting as mentors to other MS clinics.”

“Most healthcare doesn’t offer anything to help us with our emotional issues, social needs or the need to continue learning and expanding our knowledge in a variety of areas after diagnosis,” says Diane. “Because of the climate in these classes and the great skill in the teachers we’ve all done more than we thought we ever could.”

While Dr. Bowen and his team continue to grapple with the mysteries of MS, the center’s philanthropy supported model leads the way, increasing well-being and the capacity for better care into the future.
From bench to bedside

The team of researchers dedicated to finding new treatments for a deadly brain cancer

With all the advancements in cancer treatment over the last decade, the standard for glioblastoma—the most aggressive brain cancer—is still surgery followed by a grueling regimen of chemotherapy and radiation. After these challenging and often painful interventions, patients might only gain a few extra months of life.

That’s not good enough for Charles Cobbs, M.D., the Gregory Foltz, M.D., Endowed Director, and his team of expert researchers at the Ben & Catherine Ivy Center for Advanced Brain Tumor Treatment. For nearly 15 years, they’ve tirelessly investigated this elusive cancer to identify and take advantage of any of its weaknesses.

Dr. Cobbs and his team have been able to conduct this work thanks to our community of dedicated supporters, many of whom know this devastating disease intimately. On top of launching a new trial this summer that offers tailored treatment options to newly diagnosed patients, the team is also looking for the treatments of tomorrow. Here are two novel ideas our researchers are pursuing thanks to support from donors like you.
A multi-pronged attack
One of the challenges of treating glioblastoma is that it not only evades detection from the immune system, but also suppresses immune cells. Immunotherapy, where the immune system is enhanced to better fight cancer, has shown enormous potential in treating other cancers, with some patients completely cured from an advanced stage of disease.

As cancer grows, it accumulates mutations and other alterations that change how genes are expressed. These changes can be seen in tumor proteins that are slightly different from their counterparts in healthy tissue. Dr. Cobbs and his team have been cataloguing hundreds of these “alternately spliced” proteins found only in glioblastoma. The idea is to use the glioblastoma-only proteins as a target for immunotherapy, helping the immune system to detect and destroy these cancer cells.

Currently, Dr. Cobbs is working with outside collaborators to understand which of the altered proteins they’ve found are located on the surface of cancer cells where they can be better detected and targeted by immune cells. He’s received an R21 grant from the National Institute of Health to uncover the best targets, a testament to the high caliber of this research.

“We’ve got to hit glioblastoma from all angles at once, because using one target might not wipe out the whole tumor,” says Dr. Cobbs. “My goal is to discover 15 or 20 of these proteins, make vaccines for them all, and be able to test each new patient to learn which combination of proteins is present in their cancer.”

Once the optimal protein targets are identified, the next step is to produce a range of immunotherapies that could be offered to glioblastoma patients based on their tumor’s protein profile.

Tumor self-destruct button
New research may have uncovered a cure for glioblastoma hiding in the cancer cells themselves. A study published in *Nature* identified tumor-resident T-cells, immune cells that stay within the confines of a patient’s cancer. These T-cells have specific receptors for cytomegalovirus (CMV), which Dr. Cobbs has long suspected to be a factor in the unrelenting growth of glioblastoma.

T-cells exist to destroy harmful cells, including cancer or infected cells. When exposed to viral proteins, they activate and attack anything with a similar viral tag.

Tomorrow’s cures today
Dr. Cobbs has found CMV in up to 90% of tumors tested, providing a target for the T-cells.

Dr. Cobbs believes that a mRNA vaccine—similar to the COVID-19 vaccines—could be the trigger these tumor-resident T cells need to go on the attack. The vaccine would be injected directly into the tumor area during surgery, delivering instructions to make CMV proteins. The idea is that the proteins will activate the nearby T-cells and trigger an immune response against the tumor cells.

“Our hope is that when the tumor resident T cells encounter viral proteins, they go ballistic and wipe out the tumor with no side effects,” says Dr. Cobbs. “This technique could also be applicable to other kinds of cancers, including brain metastases.”

Dr. Cobbs is in conversation with local biotech company, HDT Bio, about developing an mRNA vaccine that would be offered through a clinical trial. His team has already collected the data needed to produce the vaccine, and pending FDA approval, this could be the first immunotherapy treatment offered to patients with glioblastoma.

Big ideas like this would not be possible without the support of donors like you.

Thank you.
Thank you for investing in the health and well-being of our community.

To learn more about the innovative research you’re making possible at Swedish, please contact:

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