

Fall 2021



*World-renowned*  
cancer therapy  
pioneer joins  
Roswell Park team

Dr. Renier Brentjens

## What's Inside

- Curaxin clinical trial for pediatric patients **p2-3**
- 3D Imaging advancements utilizing today's technology **p4-5**
- Quality of Life grants **p6-7**

To learn more about the impact of your support, visit [RoswellPark.org/giving](https://RoswellPark.org/giving)

This September, Roswell Park welcomed one of the most influential and accomplished figures in the field of cancer immunotherapy home to Buffalo. Renier Brentjens, MD, PhD, has transitioned into his role at Roswell Park as Deputy Director, The Katherine Anne Gioia Endowed Chair in Cancer Medicine, Chair of the Department of Medicine and Professor of Oncology in the Departments of Medicine and Immunology.

Dr. Brentjens is a pioneering cancer researcher whose work along with a small team of scientists at Memorial Sloan Kettering Cancer Center brought forth the first FDA-approved cellular therapies to incorporate adoptive cell transfer: CAR T therapy, or chimeric antigen receptor T-cell therapy. CAR T therapy genetically engineers a leukemia patient's own immune cells to target cancer cells.

"Renier is both an amazing physician and a research star, and we couldn't be more excited to welcome him back to Buffalo," says Candace S. Johnson, PhD, Roswell Park President, CEO and M&T Bank Presidential Chair in Leadership. "His achievements in cellular therapy have helped drive major shifts in how we treat many cancers today and make an outstanding pairing with our own innovations in immunotherapy and cell-based therapy.

## Coming home to Buffalo

If you ask Dr. Brentjens why he chose to come to Roswell Park, he has two main reasons:

### 1. The continual growth and advancements in the facilities and work that's being done here, with a special focus on the commitment to investing in advancing cell therapies.

"Over my career span, we've learned much more about the immunology of cancer and how cancer cells can subvert the immune system and evade the immune system," he said. "But we've also learned more about ways that we can adjust or modify the immune system to overcome some of the ways the cancer cells try to evade that ... It's my hope that we start to treat cancers — both solid and liquid tumors — utilizing these types of engineered immune-based therapies."

"Clinical trials for cell therapies are very expensive; very exciting, but very expensive," he said. "One of the great attractions for me coming to Roswell was the commitment by Candace and the Board to support these trials. Of course, much of that support will have to come from philanthropy. If we want to move this technology forward, we need the scientists, we need the clinicians and we need the donors."

### 2. Coming home to Buffalo; a city he knows and loves.

"I know Buffalo for the great city that it is. They didn't have to convince me that Buffalo is a great place to live," he said. "People from Buffalo, wherever they are in the country, will always let people know they're from Buffalo ... There's something about being from Buffalo that nobody from New York City or from California or from anywhere else can really shake out of us."

*(story continued on back page)*

Roswell Park is one of very few centers in the United States equipped to offer clinical trials of a full range of immunotherapies, including many that were developed right here.



# CURAXIN CLINICAL TRIAL

When a clinical trial for pediatric patients was in jeopardy, donors stepped in

Roswell Park's Dr. Andrei Gudkov

Donors played an invaluable role in rescuing a project that has the potential to help children all over the world. When traditional funding fell through to start the phase 1 pediatric clinical trial of a new anticancer drug, curaxin, Roswell Park doctors turned to philanthropic giving. What they received has kept their work viable, bringing a unique opportunity for Roswell Park to lead a new trial.

This trial has been 15 years in the making under the leadership of Andrei Gudkov, PhD, DSci, Senior Vice President, Research Technology and Innovation, and Chair of the Department of Cell Stress Biology and Katerina Gurova, MD, PhD, Associate Professor of Oncology, Cell Stress Biology. Their discovery of curaxin precursor molecules has led the pair of scientists down a myriad of paths to bring them to this trial. It began all those years ago with a question about kidney cancer and expanded into an opportunity for a range of cancers today.

"Thanks to curaxins, our general understanding of cancer broadened dramatically," Dr. Gudkov said. "Even before the drug became approved for treating patients, it already played a big positive role in broadening our knowledge."

With the phase 1 adult clinical trial ending in 2019, the door was open to pursue a trial for pediatric patients.

## Full speed ahead for the pediatric trial

All along, Dr. Gurova intended this project to ultimately treat children, she explained. It is necessary, however, to complete the trial with adult patients before testing the treatment in children.

"It's very rare that drugs are developed specifically for children's malignancies almost from the beginning. Mostly we see drugs approved for adults being tested in children afterward," she said.

While the adult trials will continue, the primary focus now will be on the pediatric trial.

Drs. Gurova and Gudkov's longtime collaborators at Children's Cancer Institute of Australia are key partners in furthering research for younger patients.

"They tried it for neuroblastoma and were very excited by what they found," Dr. Gurova said. "Since that moment, we were travelling this path together; we were doing adult cancers, they were doing children's malignancies."

After those Australian colleagues were met with success, they were approached by the National Cancer Institute's Children's Oncology Group (COG): the most reputable organization in the U.S. that coordinates international clinical trials for children with cancer. COG wanted to run a clinical trial for children.

Within COG, there are over 40 member sites dedicated to early phase clinical trials for children across the U.S., Canada and Australia. Roswell Park is not one of those sites, **but due to the absolutely central role of Drs. Gurova and Gudkov in discovering the molecules used to develop this drug, curaxin, right here in Buffalo, Roswell Park will participate in the pediatric trial.**

The donor-funded clinical trial will include all solid cancers and lymphoma, Dr. Gurova said. It could take two to three years to complete.

## Your crucial impact

As is standard for the organization, COG offered to fund all aspects of the pediatric clinical trial except the drug supply. But the trial plans hit a wall when the company that had been manufacturing curaxin ran out of money and couldn't secure new investment, Dr. Gurova explained. There was enough of the drug made to begin the trial, but there wouldn't be enough to finish. There would be no green light for an only partially ready trial.

**"That became a serious problem, and it was sort of a catastrophic situation for me because I felt that the trial was ready to go and at the same time, the drug was not available," she said.**

Roswell Park committed to find the funding to keep the trial on track. Due solely to the abundant generosity of Roswell Park supporters the funding was secured and the trial saved.

"I feel enormously grateful, and I feel very happy that we can move forward," Dr. Gudkov said. "But relief will come when we start seeing children being cured."

With the funding in place, the project is surging forward with the hopes of reaching children this calendar year.

This endeavor would have been rendered impossible without the dedication of supporters who see the immeasurable value in discovering tomorrow's cancer treatments today.

**"I want our donors to know how critical and decisive their role can be," said Dr. Gudkov. "Sometimes people, when they give money for research, they're under the impression that they're just adding a drop into a big stream.**

"It has been my lifelong goal to try to make an anticancer drug; it's the reason I came into science," Dr. Gurova said. "This whole study would not be possible without this money."

## HOW CURAXIN WORKS

Cancer is uncontrolled cell division. For every cell division, the cell needs to copy DNA.

Many chemotherapeutic drugs block DNA replication to stop cell division; an approach that is still mainstream today for cancer treatment. This approach, however, damages DNA leading to mutations in both tumor and normal cells. Curaxin binds DNA but causes no damage to DNA itself. Instead, curaxin binds to DNA and prevents packing of DNA into chromatin.

Chromatin stores DNA in cells and its proper structure is critical for cell function and division.

At every cell division, chromatin is dismantled to allow DNA replication and then reassembled. Constant division of tumor cells lead to poor chromatin packing in these cells compared with normal cells. Chromatin disorganization is even stronger in cells of pediatric cancers, making them especially vulnerable to curaxin.

That's what will be tested in the phase 1 pediatric clinical trial of curaxin.

**"I want our donors to know how critical and decisive their role can be."**

**- Dr. Katerina Gurova**





## 3D IMAGING ADVANCEMENTS

*Utilizing today's technology to shape the future of cancer care*

Science is constantly pushing forward, creating new options for patient care. Thanks to generous donor support, Roswell Park is at the forefront of that advancement, adopting technology that is not yet mainstream in medicine: 3D printing.

In the near future, Diagnostic Radiologist Larson Hsu, MD, Director of 3D Imaging, predicts 3D printers will be incorporated across the board in patient care and Roswell Park has the potential to be among those leading the way in 3D printing and imaging. As more and more surgeons incorporate this technology into their care, Dr. Hsu calls it “the future of medical imaging.”

### Setting the Model

Roswell Park's state-of-the-art 3D printing lab empowers Dr. Hsu to give his colleagues a “more realistic view” of their patients' areas of concern. Using the cross-sectional images from a CT scan, Dr. Hsu can create a physical model to show a surgeon, for example, exactly what they'll see when they begin surgery.

“Currently, we're looking inside a patient using cross-sectional imaging, basically a series of two-dimensional images from a CT scan,” Dr. Hsu explained. “But when you actually go into a patient, you're in a three-dimensional world.”

Dr. Hsu kickstarted Roswell Park's donor funded 3D Imaging program 2 years ago, incorporating virtual reality to allow clinicians to see and manipulate these models, seemingly in mid-air. He's now taking the next step, turning those digital 3D models into something they can hold in their hands. By seeing exactly where a tumor sits in relation to nearby bones and blood vessels, a surgeon can more confidently plan their course of action once they're inside.

Those models aren't only helpful for the clinicians, but they can also be highly valuable for the patients.

“Holding a model like this can give a surgeon better ability to educate the patient on why we're doing this procedure so the patient can give better informed consent,” Dr. Hsu said. “I think it's very important for patients to know what's going on with their body and exactly the reason why we're doing the certain therapy that we're doing.”

This type of work makes an invaluable impact on the patient in real time. That makes Dr. Hsu dive in even more passionately: “I'm impatient. Compared to traditional research work that can take years, this new technology allows me to help patients right now. I'm able to help the surgeons provide better care today. This is only possible because of the money from the Alliance Foundation.”

### Personalized Medicine

Since this approach to medicine is so new, Dr. Hsu says he's reliant in part on clinicians to dream big and look for ways their work can be improved through 3D imaging. The first 3D printing projects were anatomical models, giving surgeons an early look into what they'd find. But opportunities abound.

**“Some of the other doctors came up with really brilliant ideas that we hadn't even thought of to utilize our technology,” he said. “The potential is really endless and there are more things we haven't even thought of.”**

For example, Vladimir Frias, DDS, MS, Director of Maxillofacial Prosthetics, saw what Dr. Hsu was able to create for other clinicians and asked about 3D printing prostheses for his patients. Typically, those are created by taking photos and making a mold of the patient's face prior to surgery, then handcrafting the prosthesis from there. Now, Dr. Hsu can access a patient's CT scans, turn those cross-sectional images into a 3D model and print a prosthesis which will replace the missing piece with astounding accuracy. Not only will the prosthesis look realistic, but it will also fit exactly right due to the more precise measurements using 3D imaging and require far less billable time to craft.

“When you buy in bulk, things come in small, medium and large; it's not patient specific,” Dr. Hsu said. “The future will be personalized medicine, meaning that whatever you use shouldn't be a one size fits all, because honestly one size fits nobody.”

3D printing is expensive and is not reimbursable by insurance, Dr. Hsu explained. He hopes that as the practice becomes more common and continues to prove the vital benefit to patients that will change.

“Just like everything, as things advance, it's going to become cheaper and more accessible to everybody,” he predicted. “In the future I think we will be routinely printing anatomical models and prostheses.”

### Looking forward

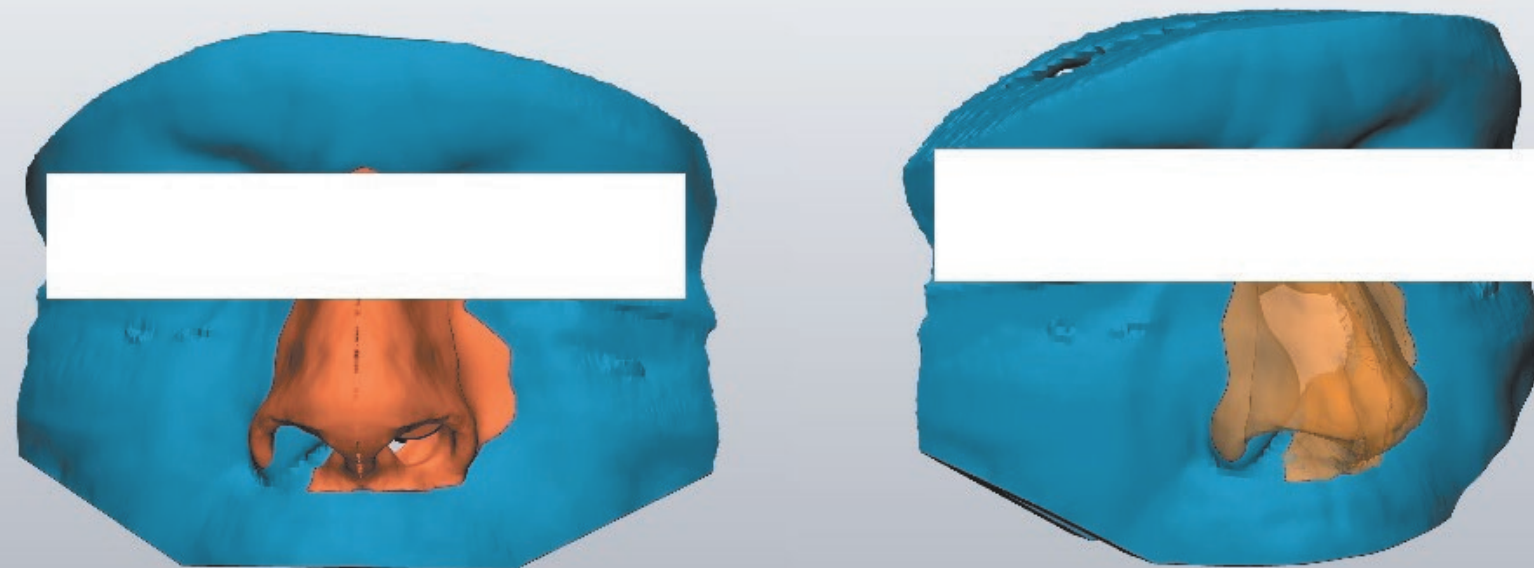
Because Roswell Park is starting down this path now, by the time this becomes standard industry practice, Dr. Hsu believes we'll be ahead of the game instead of playing catch up.

“There's only a handful of big players who do this kind of work around the country,” he said. “It's really incredible that at Roswell Park we have support from our donors to allow us to do things like this in Buffalo.”

There are two primary things that are needed to continue advancing this groundbreaking program: time and funding.

Time is needed to bring the medical industry more actively on board, to imagine more innovative ways to serve patients and to advance the technologies that power the program.

Funding will be critical to stay on the cutting-edge of 3D printing technologies and practices, to develop more creative options and ultimately grow the program.





# Quality of Life grants

Donors play a key role in compassionate cancer care

**A**t Roswell Park Comprehensive Cancer Center, patient care goes far beyond medical needs. Improving our patients' quality of life through programs, services and technology today is just as critical for compassionate care as the research that will shape cancer treatments of tomorrow.

The Quality of Life Programs at Roswell Park are 100% donor funded. It is thanks entirely to your generosity that our patients who are facing all varieties and stages of cancers benefit from these opportunities.

From the Patient and Family Resource Center to technology to relieve stress. These are a few of the amazing programs and services available for patients this year, thanks to your dedicated support:

## Memories to hold onto

Oftentimes, due to the stress brought about by a cancer diagnosis, those affected may have a desire to unload their experiences through the gift of storytelling. The stories shared may cover a wide range of topics including love, family, career, hopes, fears, travels and other life adventures. The heartfelt stories are taped by Life Recorded staff members and made available to participants either by CD or DVD.

Throughout the pandemic, Roswell Park has seen an uptick in patient requests to participate. This grant will empower the program to expand the part-time role of Life Recorded Coordinator to a full-time role. That additional time will allow more patients to take advantage of this invaluable program, preserving their memories for years to come.

## Tech to relieve anxiety and stress

Working in healthcare can mean being in a highly stressful, demanding work environment. The COVID-19 pandemic has also unleashed unforeseen stressors that continue to evolve day by day.

Through this grant, Roswell Park will have the opportunity to offer FDA-cleared Cranial Electrotherapy Stimulation technology to employees to treat insomnia, anxiety, depression and pain. Devices of this nature are already available to patients in the Palliative Care Clinic and Radiation Oncology. An additional 35 devices — one in each Roswell Park inpatient and outpatient area — will be added for employee use and patient use, if they'd like to try it. This technology uses a very small and safe amount of electricity to bring the users brainwaves back into balance. After a 20-minute session, people usually feel refreshed, focused and a lot calmer, relieving tension and stress and enabling better sleep without the use of drugs.

## Special monitors for chemotherapy

Insertion of a peripheral IV (PIV) is standard of care and a common procedure for administering chemotherapy in most patients, but that increases the risk for extravasation, the leakage of an injected drug outside of the blood vessels, and the infiltration of vesicants and irritants in tissue surrounding the IV insertion site. Those injuries can lead to patient complications including pain, decreased function and nerve and tendon damage.

This grant will introduce 10 special monitors to help clinicians detect any concerns early, before they're visible to the human eye. This pilot study will be carried out in patients receiving vesicant infusions through a PIV at the Infusion Center at the downtown campus to help determine if this kind of monitor should be more widely implemented at Roswell Park.

**“**The Life Recorded Program provides opportunity for genuine expressive, carefree sharing, with no prompts, scripts or agenda. An individual's story becomes an indelible lasting legacy for the patient and family. This program compliments Spiritual Care as it continues the work of deep listening, upon sacred ground, lending itself to enhanced care.”

- Rev. Dr. Melody Rutherford



**In total, more than \$2.8 million was granted to more than 50 Quality-of-Life Programs. Here are just a few more examples of what you're making possible for patients at Roswell Park.**

- Transportation Services for Patients
- Language Assistance/Interpreter Services
- HLA Typing/Donor Selection for Allogenic Transplant Patients
- The Resource Center
- Pediatric Cancer: Pediatric Medical Psychologist, Pediatric Hematology Psychosocial Support and Child Life Specialist
- \*Patient Navigators
- LegalCare Program
- Creative Arts Team
- Psychosocial Support for All Young Adults with Cancer
- Support for Children of Adult Patients
- \*New Patient Portfolio Toolkits
- \*Virtual Bedside Attendant Services Program
- Supporting Fertility Preservation for Our Young Adults
- Chemotherapy & Radiation Orientation Support Kits
- End of Life/Bereavement Support Program/Doula Program

\*new or expanded program in 2021

*(continued from front page)*

## His path to Roswell Park

Dr. Brentjens graduated from Buffalo schools Waterfront Elementary School and Canisius High School before heading off to study history at Davidson College in North Carolina. Moving back home to Buffalo, he then earned his medical and doctorate degrees from the University at Buffalo. When asked about his liberal arts degree, he laughed.

“It was always the plan to go to medical school, but I thought to myself, why waste this great opportunity for four years of [liberal arts] education and not be able to learn about something that I love,” he explained. “If you are doing an exam on a patient, you are uncomfortably close and invading their space. It’s great to be able to distract your patient from this awkward situation . . . with a liberal arts education and a degree in history, I can always find something.”

Dr. Brentjens completed his medical residency at Yale New Haven Hospital in Connecticut before beginning his career in earnest in New York City. For the past 23 years, he has devoted his skills to Memorial Sloan Kettering Cancer Center in New York City, where he most recently served as Director of Cellular Therapeutics Center and Associate Chair for Junior Faculty Development in the Department of Medicine. It is there that he was able to work on the groundbreaking developments in cellular therapies for patients with leukemias which have earned him widespread admiration.

One thing he had to determine before he made the move, was whether he’d be able to continue his work at the level he had been used to. Luckily, that answer was yes and then some: **“There are things that I can do better here and more things I can do here than I could do in New York.”**



**“My goal coming to Roswell Park is to make the institution a target institution to come to, not just regionally, not just locally, but nationally and internationally.”**

## What’s next

Dr. Brentjens is eager to get to work and is confident in the support he will continue to receive to advance this lifesaving work, saying his hiring was “a clear and distinct commitment and intent to cell therapy for cancer.”

“In my laboratory, we’re working on the next generation of cell therapies, focused on solid tumors, which are a lot more challenging to treat with this type of therapy than blood cancers like leukemias and lymphomas. But we think there is a potential for that.”

Aside from his personal projects in the lab, Dr. Brentjens has big dreams for Roswell Park as a whole.

“My goal coming to Roswell Park is to make the institution a target institution to come to, not just regionally, not just locally, but nationally and internationally,” he said.

That will continue to require top-notch scientists, clinicians and administrators. It will take innovation, creativity and truly hard work. It will also require the steady support of donors who believe in the mission of bringing about a world in which a cancer diagnosis is nothing to fear.