The University of Arizona Steele Children’s Research Center is the research arm of the UA Department of Pediatrics and one of the prestigious Centers of Excellence at the UA College of Medicine – Tucson. Established in 1992, the UA Steele Center is the only facility in Southern Arizona where researchers and physician-scientists work together to advance medical knowledge through research to improve children’s health. Areas of research include: allergy and immunology, autoimmune disorders, cancer, cardiology, critical care, developmental pediatrics, endocrinology, gastroenterology and nutrition, genetics and pulmonology. What’s more, our physician-scientists provide compassionate clinical care to patients at Diamond Children’s and pediatric outpatient clinics in Tucson and throughout the state. As UA Department of Pediatrics faculty, they teach and train the next generation of pediatricians and researchers.

2015 EVENTS

APRIL 25
PANDA 16th Annual
“Children Helping Children” Fashion Show and Luncheon
The Phoenician Resort, Scottsdale

MAY 28
Father’s Day Council Tucson
“Fathers of the Year Awards Gala” Loews Ventana Canyon Resort

AUGUST 21
Tee Up for Tots Golf Tournament
OMNI Tucson National Resort

OCTOBER 11
Kids of Steele Miniature Golf Tournament
Golf N’ Stuff

OCTOBER 16
Diamond Children’s/Steele Center Gala
The Westin La Paloma

STAY CONNECTED to the UA STEELE CHILDREN’S RESEARCH CENTER

Learn more about what’s happening at the UA Steele Center through our website: steelecenter.arizona.edu

“Like” us on Facebook
Follow us on Twitter
OUR STORY: Robyn, Phil, Claire and PJ Calihan

Philip John Calihan IV, “PJ,” was born on August 30, 2012. PJ was growing and eating. Besides some projectile vomiting (which didn’t seem out of the ordinary since Claire experienced it as an infant), he seemed healthy. When PJ was about 4 months old, we knew something was wrong. PJ hadn’t rolled yet and the projectile vomiting had worsened to every time he ate or drank. By 6 months, he still hadn’t met his milestones (no rolling, no sitting up). When we tried to feed him, he had fits of choking, gagging, and severe vomiting. The choking and gagging got so bad that PJ began to refuse to eat. In one month he lost two pounds. We were scared to death. Something was seriously wrong. We began to search for answers.

I was screaming inside for someone to listen to us and help us, but they didn’t. We were told by medical professionals: “Boys develop later,” “Look at him, he’s so big,” “He is a typical 6-month-old,” “You have nothing to worry about,” “If he keeps vomiting, come back and see me, it’s probably just a virus.” These comments made us feel like we were crazy, neurotic parents. We finally demanded help, and our pediatrician referred us to therapists. PJ failed the standardized tests in these therapies. He lacked gross motor skills and the ability to feed. We didn’t know what caused his symptoms. We desperately needed answers.

PJ began to progress in therapy. He began to roll and sit up. We received a referral for a Modified Barium Swallow Test, which showed PJ had dysphagia—he aspirated all liquids thinner than honey. We now had an answer for the choking, gagging and vomiting. The liquids were penetrating his lungs when he swallowed; we were instructed to thicken his fluids, but we still didn’t know what caused the dysphagia. Two months went by with no answers.

In August 2013, the mom of one of Claire’s dance-class friends referred us to Dr. Fayezy K. Ghishan in Tucson. PJ was almost 12 months old. Dr. Ghishan was the friendliest doctor Phil and I had ever met. He listened to us. He asked us about PJ’s labs and tests results. When we told him other doctors had insisted nothing was wrong, so lab tests hadn’t been conducted, Dr. Ghishan told us something was definitely wrong with PJ. He was the first to really help us. For once, we didn’t feel crazy. We felt relief. A week later, PJ was scoped, labs were done and we saw a team of doctors at the PANDA Children’s Aerodigestive Disorders Center.

We finally received answers. A hiatal hernia in PJ’s esophagus caused severe reflux. He was also diagnosed with eosinophilic gastroenteritis (EG). PJ began medications and an elimination diet, and he started to thrive. He started eating solid foods. He crawled properly, walked, and is now running! At 2½ years old, PJ remains on thickeners, medications, gluten-free and dairy-free diets (for the EG) and continues his therapies. Besides his speech delay, he looks and acts like a typical toddler. PJ is our little angel and we can’t imagine our lives without our munchkin!

As PJ’s health improved, Claire was hospitalized in November 2013 for pneumonia. While there, her records indicated something else might be going on. Nearly 4 years old, this was Claire’s third bout of pneumonia, her second hospitalization and she had suffered from about 12 cases of croup during the year. The hospital ran tests that came back normal, and she was released. We called Dr. Ghishan and headed to Tucson the following week. The aerodigestive team looked at her records and determined them abnormal. Dr. Cori Daines and Dr. Ghishan looked at a prior scope done in Phoenix and discovered parts of it looked abnormal even though we had been told otherwise.

We spent New Year’s Eve at Diamond Children’s, and Claire was scoped again. Dr. Ghishan told us, “You are never going to believe this.” Claire also has a hiatal hernia in her esophagus. We were stunned. We had gone four years with our daughter projectile vomiting as an infant, assuming it was “normal,” suffering from croup as a toddler, and told she would “grow out of it.” Dr. Ghishan put Claire on medication for the severe reflux. Claire is now a healthy, thriving little girl. She is the “pre-K monkey bar queen,” loves gymnastics and is very protective of her little brother.

We are so grateful to Dr. Ghishan and his team for changing our family’s life, for giving us answers, hope and health. Every time we see Dr. Ghishan or talk about him, we smile, laugh, and feel so blessed to have him in Arizona and at the UA Steele Center, where they are changing lives every day through research.

With all our love and support to Dr. Ghishan and his team at the UA Steele Center,

(Bear Down!) Robyn and Phil Calihan III

This year’s cover models, Claire and PJ, with their parents, Phil and Robyn and their dog, Teddy.

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MESSAGE from the Director

Dear Friends,

I’m so grateful for YOU!

For the past 22 years, the UA Steele Children’s Research Center has improved children’s health through research and discovery and it’s all because of you.

In particular, I would like to express my gratitude to the following groups who work tirelessly to raise desperately needed funds for our research and programs. Please know, of course, that I am so grateful for ALL our supporters—countless individuals who are committed to our mission to teach, to heal, to discover.

First, I’d like to thank our Tucson Advisory Board—some of our members have served for more than 20 years! Your continued dedication to the Steele Center inspires me. This year, you committed to raise the funds needed to complete the Louise Thomas Endowed Chair in Pediatric Cancer Research. You are almost there—impressive!

The Arizona Elks Major Projects have generously supported us since 1992, when the Steele Center was established in the University of Arizona’s Horace W. Steele Center for Pediatric Research. Because of the Elks’ most recent support, we were able to expand to Phoenix in 2014—opening our new offices in September. Come visit us!

Father’s Day Council Tucson held its 20th annual Fathers of the Year Awards this year. What a momentous accomplishment, and a testimony to your commitment to support our type 1 diabetes research and endowment so we can unravel the mysteries of this perplexing disease that afflicts so many.

To our Phoenix Women’s Board—the PANDAs—you are such a wonderful group of women, supporting us since 1999. Your enthusiasm, determination and dedication to helping us improve children’s health through research motivates me every day. The funds you raised in 2014 to support our autoimmune diseases research will help us discover and create novel treatments for disorders such as Crohn’s disease, ulcerative colitis, type 1 diabetes and celiac disease, to name a few.

The Kids of Steele—what a creative and innovative group! You have grown so much in just four short years! I’m impressed with the service projects and fundraising events you have organized. You have done a great job of raising community awareness about the Steele Center!

Again, I say a heartfelt “thank you!” to ALL our supporters. You are our partners in the Steele Center’s quest to improve children’s health! We couldn’t do our work without you.

In gratitude,

Faybez K. Ghishan, MD
Professor and Head, The University of Arizona Department of Pediatrics
Horace W. Steele Endowed Chair in Pediatric Research
Physician-in-Chief, Diamond Children’s
This annual report is dedicated to the memory of Dana Morgan, who passed away from complications of Acute Lymphoblastic Leukemia (ALL) on Thursday, January 22, 2015. Dana was just 10 years old. Dana, aka, “the Dananator” was an incredibly bright light in this world, with her exuberant smile, playful eyes, unbridled enthusiasm, boundless energy, easy laughter, quick wit and her own personal sense of style. Although Dana’s time on this earth was short, what a full life she lived!

Among so many things Dana loved, she loved dolphins. Especially her stuffed dolphin “Swimmy.” During her six-year battle with leukemia, she’d be seen at Diamond Children’s with her beloved Swimmy, hugging him through painful procedures, tests and long hospital stays.

Dana had gumption and determination. She wanted to be a police officer when she grew up. And a rock star. She loved swimming and playing baseball. She was a huge UA football fan. She was definitely a UA Wildcat!

Dana had a creative sense of fashion that delighted those who knew her. Bow-ties and fedora hats were just a few of the ways she expressed her individuality. She did NOT like the color pink. Her favorite color was green.

Our hearts, though heavy, have been forever inspired by Dana. We will never forget this magnificent girl.

A team of researchers led by the UA Steele Center discovered that curcumin—the bioactive molecule derived from the spice turmeric—blocks the protein cortactin in colon cancer.

Cortactin is a protein essential for cell movement and frequently is overexpressed in cancer, thus facilitating cancer cell metastasis to other organs in the body.

Colon cancer is the second-leading cause of cancer-related deaths in the United States. When cancer metastasizes to other organs, a patient’s chances of survival are greatly diminished. Thus, an urgent need exists to find new ways to prevent cancer from spreading.

This study was led by Fayez K. Ghishan, MD, Pawel Kiela, DVM, PhD, and Vijay Radhakrishnan, PhD, from the Steele Center. Jessie Martinez, PhD, professor, UA Cancer Center, and Eugene Mash, PhD, professor, Department of Chemistry and Biochemistry, collaborated on the study as well.

Turmeric gives curry its yellow color and flavor. It is part of the ginger family and has been used for thousands of years to treat colds, inflammation, arthritis and many other ailments, including cancer.

Curcumin is the active ingredient in turmeric and has been scientifically studied in many types of cancer. It has been shown to have a chemopreventative effect—the ability to reverse, suppress or prevent the development of cancer.

“What’s novel about our research is that our study identified one of the mechanisms by which curcumin can prevent cancer cell metastasis in colon cancer,” said Dr. Ghishan.

The research team discovered that the active component of the cortactin protein, known as Phospho Tyrosine 421 (pTyr421), is hyper-activated in malignant tumors of the colon.

“We showed that the cortactin protein was hyper-activated due to a process called excessive phosphorylation,” said Dr. Kiela.

Phosphorylation is the addition of a phosphate group to a protein, and is responsible for turning proteins on and off, altering the protein’s function and activity. Too much cortactin, and its activation by phosphorylation, has been linked with cancer aggressiveness.

Curcumin is turned off, cancer cells lose the ability to move and can’t metastasize to other parts of the body.”

“By identifying the mechanism of action—that curcumin activates the enzyme PTPN1, which then ‘turns off’ the active component of cortactin pTy421, we believe chemopreventative drugs can be developed to target cortactin in cancer cells to prevent the cancer from metastasizing,” said Dr. Radhakrishnan.

“Treatments aimed at the suppression of cancer metastasis remain an urgent therapeutic need.”

“More specifically, curcumin “turned-off” cortactin by interacting with, and activating, an enzyme known as PTPNs. This enzyme acts as a phosphatase to remove phosphate groups from cortactin—a process known as “dephosphorylation.”

“This effect, essentially known as ‘dephosphorylating cortactin,’ correlated with reduced ability of colon cancer cells to migrate,” said Dr. Kiela. “This means the cancer can’t metastasize.”

Phosphorylation is the addition of a phosphate group to a protein, and is responsible for turning proteins on and off, altering the protein’s function and activity. Too much cortactin, and its activation by phosphorylation, has been linked with cancer aggressiveness.

The researchers treated human colon cancer tumor cells with curcumin. “We discovered that curcumin turns off the active form of cortactin,” explained Dr. Radhakrishnan, who led the experiments in the lab. “Thus, when cortactin...
Researchers at the UA Steele Center and College of Science have developed a new drug and delivery system to treat ulcerative colitis—ulceration and inflammation in the colon.

The system, a carrier drug the research team termed a "molecular truck," shows promise in treating ulcerative colitis, one of the two forms of inflammatory bowel disease, or IBD. "This drug has the potential to be a major advancement in the treatment of infants and children with ulcerative colitis, who have difficulty taking available medications," said Fayez K. Ghishan, MD, Steele Center director.

The development and testing of the molecular truck was completed by Dr. Ghishan, Eugene A. Mash Jr., PhD, professor, Department of Chemistry and Biochemistry, UA College of Science; and Steele Center researcher Pawel Kielia, DVM, PhD, associate professor, Department of Pediatrics.

**About IBD**

IBD is chronic inflammation in the intestinal tract. The two most-common forms of IBD are ulcerative colitis and Crohn’s disease. In ulcerative colitis, the inflammation affects the inner lining of the colon (the mucosa), where painful ulcers may develop. With Crohn’s disease, inflammation may affect the entire digestive tract.

An estimated 50,000 children in the United States have IBD, a number that has been increasing in recent years. Symptoms include severe abdominal pain, diarrhea, vomiting, cramping, fatigue and weight loss. There is no cure and long-term management of IBD can be very challenging.

**Overcoming Limitations of IBD Treatment**

Aminosalicylates are one of five types of medications used to treat IBD. These compounds contain 5-aminosalicylic acid (5-ASA, mesalamine, mesalazine). Examples are sulfasalazine, balsalazide and salsalazine. These drugs are given orally or rectally to decrease inflammation.

Because 5-ASA is absorbed rapidly in the stomach and small intestines, its ability to reach and treat inflamed areas in the colon is limited. Consequently, modifications to 5-ASA have involved binding it to a "carrier" molecule, enabling the drug to travel through the stomach and intestines to the colon, where bacterial enzymes release the 5-ASA from its carrier. Sulfasalazine, balsalazide and olsalazine are all "carrier-drug" combinations, while mesalamine is used in delayed-release formulations. All of these can reach the colon to treat ulcerative colitis.

Unfortunately, sulfasalazine can cause nausea, heartburn, headache, skin rashes and bone marrow suppression. Although mesalamine, balsalazide and olsalazine have fewer reported side effects, many patients cannot benefit from these drugs due to allergic reactions that cause cramps, abdominal pain and worsened diarrhea.

What’s more, all of the aminosalicylates are available only in large tablet or capsule forms that can be difficult for children to swallow.

"Currently, there is no oral drug in the form of a suspension available for children who can’t swallow large tablets or capsules to treat their IBD," said Dr. Ghishan.

**From MRI Imaging, to Olestra, to the Molecular Truck**

"As is often true in science and medicine, concepts and ideas from one area inspire discoveries in another," said Dr. Mash.

In previous research, Dr. Mash developed a contrast agent for MRI (Magnetic Resonance Imaging) that selectively imaged tissue in the GI tract. The inspiration for the new MRI contrast agent came from the failed "fake fat" Olestra—a non-digestible fat substitute derived from sucrose and mixtures of fatty acids. Olestra passes unmodified through the GI tract.

"Once we established selective imaging of the GI tract, selective drug delivery to the colon via oral administration of the drug was a logical next step," he explained.

Dr. Ghishan explained. "This drug has the potential to be a major advancement." A similar dose of sulfasalazine, and showed improved efficacy in reducing colonic inflammation in mice.

"While our molecular truck appears equally, or more effective than sulfasalazine in a mouse model of ulcerative colitis, that is not enough to replace the currently established therapy," said Dr. Kielia. "To become the therapy of choice, our invention must specifically target sites of inflammation. The anti-inflammatory effects of 5-ASA are directly related to its local concentration in the colonic mucosa. The design of our new drug allows for modifications that would increase retention and release 5-ASA, specifically at sites of colonic ulceration.”

"So our next area of research is to focus delivery of the drug to specific regions of the colon damaged by inflammation," said Dr. Ghishan. "This should lower the drug dosage necessary to achieve the desired outcome."

The invention is patent-pending, and the researchers are working closely with Tech Launch Arizona on the intellectual property and commercialization aspects of the technology.

"Now, we need to find investors and funding to establish a company to complete the developmental and pre-clinical work necessary to bring this new drug to the market," said Dr. Ghishan.
FOCUS ON PHOENIX

IDENTIFYING Children with Autism Spectrum Disorders in Arizona

According to the U.S. Centers for Disease Control and Prevention (CDC), autism spectrum disorders (ASD) are lifelong developmental disabilities characterized, in varying degrees, by difficulties in social interaction, communication and repetitive behaviors. Children with ASD may have significant impairments in social and communication skills. Learning, thinking and problem-solving abilities of children with ASD can range from gifted to severely challenged.

In Arizona, about 1 in 64 children is identified with autism spectrum disorder, as determined by the Arizona Developmental Disabilities Surveillance Program (ADDS) Network, which has been tracking ASD in Maricopa County since 2000. The ADDSP is part of the CDC’s Autism and Developmental Disability Monitoring Network, which tracks autism in 12 sites throughout the nation.

In December 2014, the UA Steele Center received a $2 million grant from the CDC to continue its work on identifying children with ASD and intellectual disabilities (ID) in Maricopa County.

The study is led by co-principal-investigators Sydney Pettgrove, PhD, epidemiologist and assistant professor, UA Mel and Enid Zuckerman College of Public Health, and Margaret Kurzius-Spencer, MPH, assistant professor, UA Mel and Enid Zuckerman College of Health, and Biostatistics, UA Mel and Enid Zuckerman College of Public Health.

“The center will help children suffering from neurological conditions such as:”

- Autism
- Behavioral and developmental disorders
- Brain tumors
- Concussions
- Congenital and hereditary disorders (e.g., cerebral palsy)
- Inflammatory and infectious disorders (e.g., encephalitis)
- Seizures and epilepsy
- Traumatic brain injury

The center is staffed with the following specialists:

- Developmental pediatrician
- Pediatric sports medicine physician
- Pediatric neurologist
- Occupational, physical and speech therapists
- Special education specialist

“Other members of the research team include:”

- Sydney Rice, MD – associate professor and developmental pediatrician, Division of Genetics and Developmental Pediatrics
- Jennifer Andrews, MBA – coordinator, Division of Genetics and Developmental Pediatrics
- Gondy Leroy, PhD – associate professor, Management Information Systems
- Paul Hsu PhD – associate professor, Division of Epidemiology and Biostatistics, UA Mel and Enid Zuckerman College of Public Health

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“Dr. Pettgrove. “This information will allow us to determine whether the proportion of children affected by autism is indeed increasing, decreasing or staying the same.”

Our team reviews thousands of special education and clinic records each study year to report on the number of 4- and 8-year-old children with ASD and/or ID, and on the demographic and behavioral characteristics of the affected children.

Between 2000 and 2010, the research team found that the average age of diagnosis for a child in Arizona decreased from 5.2 years to 4.9 years, and 37 percent received their first evaluation by the age of 4.

“Our goals are to improve the understanding of these disorders and carry out education and outreach activity, working in tandem with our community partners,” said Dr. Kurzius-Spencer.

“We must continue to track autism spectrum disorders because this is the information communities need to guide improvements in services to help children.”

“Sydney Rice is medical director for the new center. Dr. Rice is a developmental and behavioral pediatrician with a particular interest in autism. I think the team approach helps us get closer to the ‘truth’ of what a child may be experiencing or need medically,” she explained. “It allows the child and family to communicate their concerns to a group of people who can all make recommendations from their specific expertise, while taking account of the other members to take into account the ‘whole child.’”

“We’re so grateful for the passion, dedication and hard work of the PANDA,” said Steele Center director, Fayez K. Ghishan, MD. “Their commitment to improve children’s health through cutting-edge research, translated into clinical care, has made this center a much-needed reality.”

Thanks to the generosity and fundraising efforts of the Phoenix Women’s Board, PANDA (People Acting Now Discover Answers)—the PANDA Children’s Neurological Center is now open. The group raised about $1 million to establish the center and fund recruitment of neurological specialists and research.

“The PANDA Children’s Neurological Center holds interdisciplinary clinics in autism, concussion, traumatic brain injury and newborn follow-up.”

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“This center enables us to provide an evaluation from many professional perspectives, guided by the family,” said developmental and behavioral pediatrician Sydney Rice, MD. Dr. Rice is medical director for the new center.

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**Dorrance Endowed Fellowship**

**UPDATE: Christy Harrison**

The Dorrance Endowed Fellowship in Pediatric Gastroenterology and Nutrition was established at the UA Steele Center in 2008, thanks to a generous $1 million gift from the Dorrance Family Foundation. The goal of the fellowship is to train young researchers in the areas of pediatric gastroenterology and nutrition.

The current Dorrance Fellow is Christy Harrison. She is working on her PhD in immunobiology with a minor in public health. Harrison’s research focuses on how the intestinal salt balance affects the ecology of microbes in our gut and how those changes are associated with inflammatory bowel disease (IBD).

“All mammals are populated by trillions of microbes, that together contribute more genetic diversity to their being than exist in the human genome,” explains Harrison. “Because of this, changes in the ecology of these microbes, such as diet or inflammation-induced change, can drastically change how those microbes interact with our bodies.”

So far, Harrison has discovered that changes in sodium transport in the gut create a highly different microbial environment in the intestine. Moreover, these changes appear to make animal models highly susceptible to autoimmune colonic inflammation. Changes in the salt balance also appear to affect the integrity of the intestinal wall, which again changes the nature of the microbiota. In her time at the UA Steele Center, Harrison hopes to draw clear connections between salt balance and how it may drive disease via the microbiome.

**Advisory Board Member**

**HIGHLIGHT: Ginny Clements**

Ginny Clements joined the UA Steele Center advisory board more than 20 years ago and she’s still just as passionate about children’s health as ever.

“Being an advisory board member is so very rewarding,” she said. “I have been blessed financially, and I hope to make a little difference in a child’s life.”

In 1990, Clements was the chairman of Angel Charity of Children, Inc., and the Steele Center was Angel Charity’s beneficiary that year. “I believed in the Steele Center when I was the chairman of Angel Charity,” she reminisces. “And now, as campaign chairman for the Louise Thomas Endowed Chair for Pediatric Cancer Research, I’m committed to ensuring that the advisory board raises the $500,000 needed to complete the chair.”

What’s more, Clements genuinely has a heart for kids. “When I was 15, I was diagnosed with breast cancer, so I know what many of these children are going through,” she explains. “It hurts me inside to see children who are autistic, who are bald because of cancer, who have muscular dystrophy and other illnesses.”

Clements supports the Steele Center because she believes children are our most precious asset. “It just feels right for me. I want the research that is being conducted at the Steele Center to give sick and vulnerable children a chance to grow up and be healthy.”

She also knows the long-term value and necessity of pediatric medical research. “I have met some of the most dedicated Steele Center physician-scientists who are working hard to improve children’s health through research. At every board meeting, we have a doctor who speaks to us about his/her research and what they are doing to erase the hurt of a child. It is exhilarating to say the least,” she said.

“I want to be known as a board member that has made a difference in a child’s life. By serving on this board, I hope I’m doing just that. Why am I on this earth if it isn’t to do my part to help a child?”

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**FATHER’S DAY COUNCIL TUCSON**

Tucson Raises $205,000 for Type 1 Diabetes

In June, Father’s Day Council Tucson celebrated its 20th annual Father’s Day Awards Dinner and Gala at Loews Ventana Canyon Resort.

“Their continued support enables us to advance our research, clinical programs and endowment.”

This annual event honors men who have demonstrated they are dedicated fathers, outstanding community role models and successful in their chosen field.

- James H. Moore Jr., president and CEO, UES Energy
- Capt. Joshua Palochak, senior mission crew commander, U.S. Air Force
- Cody Ritchie, president, Crest Insurance
- Neal Weitman, general manager, Royal Automotive Group

“We are so grateful for Father’s Day Council Tucson,” said Steele Center director Fayez K. Ghishan, MD. “Their continued support enables us to advance our research, clinical programs and endowment.”

The event raised about $205,000. Over the past 19 years, Father’s Day Council Tucson has raised nearly $3.3 million to support type 1 diabetes research, clinical programs, faculty recruitment and the Father’s Day Council Tucson Endowed Chair for Type 1 Diabetes.
PEDIATRIC cancer facts:
Over the past 50 years, cure rates for childhood cancers have improved from approximately 50 to 80 percent.

How does an endowment work?
An endowed chair provides a mechanism for perpetual funding. The principal of the gift is never spent. It is invested, and a portion of the interest income is made available each year to support the designated research. This allows the holder of the chair to continue his or her research without interruption to explore new and promising avenues of research that likely will result in future grant funding. This is extremely important, especially in this era of increasing competitive federal research funding.

In 2005, Emmanuel Katsanis, MD, was appointed the Louise Thomas Endowed Chair in Pediatric Cancer Research. Dr. Katsanis is a leader in the research area of immunotherapy. He and his team are working hard to discover ways to stimulate a patient’s own immune system to fight cancer.

Emmanuel Katsanis, MD, and his team of pediatric cancer researchers are currently investigating ways to improve outcomes of haploidentical bone marrow transplantation (h-BMT).

Haploidentical bone marrow transplantation provides an alternative for cancer patients who need a bone marrow transplant but cannot find a donor match. This means a donor doesn’t have to be a perfect match—he or she can be a “half-match.” Thus, a pediatric patient’s parents or siblings could be suitable donors.

“They are particularly important in Arizona where we have a large population of Hispanics, who only have about a 45% chance of finding an unrelated bone marrow match,” explained Dr. Katsanis. “So, haplo transplant is a good alternative.”

The procedure has many possible risks, however, such as the body rejecting the bone marrow, relapse, developing graft versus host disease (GvHD), or a life-threatening infection.

Ultimately, we believe our findings will lead to new drugs that will improve outcomes for patients who receive h-BMT.”

The researchers are studying novel drugs that they believe will lessen GvHD while allowing donor T cells to still attack leukemia cells.

“So far, our animal studies have shown that these new agents promote donor cell acceptance by the recipient and suppress GvHD and leukemia relapse,” said Dr. Katsanis.

“Ultimately, we believe our findings will lead to new drugs that will improve outcomes for patients who receive h-BMT.”

Would you like to help discover a cure for cancer? Here’s your chance.

In 2014, the UA Steele Center’s Tucson advisory board committed to completing the Louise Thomas Endowed Chair in Pediatric Cancer Research. The endowment was at $1.5 million when the campaign started and will be completed when it reaches $2 million. “We’ve committed to raising $500,000 and we’re nearly there,” said advisory board member Ginny Clements, who is leading the campaign.

The Steele Center created the endowed chair in honor of Louise Thomas. After the painful experience of losing their son to cancer, Louise and her husband, Al, became passionate advocates for the importance of medical research to find new treatments for childhood diseases.

How can I help CURE Cancer?
If you would like to support the Louise Thomas Endowed Chair in Pediatric Cancer Research, you may use the enclosed envelope or go the UA Steele Center’s website, www.steelecenter.arizona.edu. Click on the link for the endowed chair within the “Giving Options” tab. Thank you for your support!

Pediatric cancer facts:
Over the past 50 years, cure rates for childhood cancers have improved from about 50 to 80 percent.

However, cancer in children still claims more lives each year in the United States than any other disease. Each year, about 16,000 children are diagnosed with cancer, and about 2,000 don’t survive.

More effective and safer treatments are still critically needed to reduce childhood cancer mortality. Research is the key to conquering cancer and improving treatment.
Maria was active in less than two weeks—a major advantage of treating congenital heart defects with catheter-based therapy because of quicker recovery time with less stress on the body.

In addition to the time donated by Drs. Seckeler, Samson and Barber, the anesthesiology team and Cardiology Services, Diamond Children’s offered most of its services free of charge. Dr. Miller spearheaded a fundraising campaign to raise an additional $16,000 needed for uncovered expenses.

“Maria was truly a team effort,” said Dr. Samson. “It was incredibly rewarding to know that we could help Maria become as normal and active as any other child, probably for the first time in her life,” said Dr. Seckeler.

Maria continues to recover and is doing well. “There have been no complications,” said Dr. Miller, who has traveled to Mexico for medical follow-up with her. “We are so grateful to all who made her life better!”

(ipictured above) Michael Seckeler, MD; Ricardo Samson, MD, MSc; and Brent Barber, MD

Dr. Seckeler, who had recently joined the UA Department of Pediatrics, agreed with Dr. Samson’s plan. They worked closely with St. Jude’s Medical, Inc. which agreed to donate the devices and equipment Maria needed for her procedure.

Amor Ministries provided transportation, coordinated the border crossing and cared for Maria and her mother while they were in the United States.

Maria—now 11—arrived at Diamond Children’s in June 2014. She underwent the catheterization procedure by Drs. Seckeler and Samson, with echocardiography support from Dr. Barber. The procedure was a success. “We repaired her defects, and she only required one night in the hospital,” said Dr. Seckeler.

Soon after, Maria received an echocardiogram at the Children’s Multi-specialty Clinic at Wilmot, which revealed the devices and equipment Maria needed for her procedure.

Over the next six years, Dr. Miller provided medical care to Maria. During that time, he worked with the missions group Amor Ministries to coordinate and raise funds needed to bring Maria to the United States for care.

In January 2011, Dr. Miller contacted Dr. Samson regarding Maria’s case, and they decided she needed an echocardiogram.

Little girl from Mexico had her damaged heart repaired for free—thanks to UA pediatric cardiologists Ricardo Samson, MD; Michael Seckeler, MD, MSc; Brent Barber, MD; the medical center, a medical device company; a missions organization and countless volunteers—all who came to her aid in a time of great need.

In 2007, retired Tucson physician John P. Miller, MD, was volunteering at a medical clinic in Puerto Peralon, Mexico. While there, he met 5-year-old Maria del Carmen Castro Vega. “It was apparent she was ill,” said Dr. Miller. “She had heart murmurs and a racing heart. She couldn’t run like other kids, was short of breath and tired easily.”

In 2013, Angel Charity for Children, Inc., named the UA Steele Center as one of its 2014 beneficiaries. Their $537,230 donation is enabling the Steele Center to increase the number of pediatric cancer clinical trials and expand basic science pediatric cancer research.

ACCOMPLISHMENTS:

Clinical Trials
In 2013, 11 children were enrolled in pediatric cancer clinical trials. In 2014, 35 children enrolled—a seven-fold increase. In addition, two new therapeutic protocols recently opened:

- Acute Lymphoblastic Leukemia (ALL): Protocol for children who had their first cancer relapse following remission.
- Acute Myeloid Leukemia (AML): A “de novo” study for children with a new diagnosis of AML.

Expanding Research
Post-docs Rita-Marie McFadden, PhD, and Shivali Justa, PhD, joined the pediatric cancer research team.

Dr. Justa is researching graft-versus-host responses in bone marrow transplants for pediatric cancer patients who have difficulty finding matches. She is working on a project related to therapeutic strategies to improve experimental haploidentical hematopoietic cell transplantation. The main focus of her study is graft-versus-host diseases (GVHD). Her project entails generating immune cell subsets that can play a tolerogenic role in haploidentical hematopoietic cell transplantation to improve the outcome of this vital treatment.

Dr. McFadden’s research focuses on preventing the switch from chronic inflammatory bowel diseases (IBD) to early-onset colon cancer. Changes in microbial populations and immune responses to those microbes have been closely associated with the progression from inflammation to colon cancer. It is critical to understand the interplay among diet, chemopreventive drugs and microbial communities to improve therapeutics. Due to the toxicity and limited effectiveness of available medications for pediatric patients, Dr. McFadden explores diet modulations using curcumin (a known modulator of inflammation), apoptosis (cell death) and cell proliferation. Dr. McFadden’s research findings demonstrated a reduction in cancer for the curcumin-fed research animals and helped unveil how microbial populations can play a significant role in disease prevention.

(pictured above) Pediatric oncologist, Yi Zeng, MD with her patient, Jude
T he Phoenix Women’s Board, PANDA (People Acting Now Discover Answers) held their 15th annual PANDA “Children Helping Children” Fashion Show and Luncheon and raised $640,000 for the PANDA Children’s Autoimmune Disorders Project and Endowment. The event took place at The Phoenician in Scottsdale in April, with 65 children modeling fashions from Dillard’s to the theme, “Through the Looking Glass...Anything is Possible.”

The dazzling fashion show was led by Scottsdale triplets fighting eight autoimmune diseases between them. Other children participating came from the Phoenix valley, Tucson, and London, England. They not only participated in the show but learned about the importance of good health and helping children who are fighting illness.

UA alumna and founding Phoenix Women’s Board member, Jacquie Dorrance, was the event’s honoree, recognized for her enduring participation and support of PANDA. She spoke about her family’s personal experience with UA Steele Center physician-scientists and the positive impact they had on a serious health condition of her grandson.

The show’s inspiring finale featured cancer-survivor Jacob Farr, who modeled in the first fashion show in 2000, while fighting leukemia. He is now healthy and headed to college.

Funds raised this year will enable Steele Center investigators to expand the basic science research in autoimmune diseases like type 1 diabetes, juvenile arthritis, inflammatory bowel disease, Crohn’s disease and celiac disease, to name a few.

Event co-chairs Brigitte Sebald and Michelle Walker each have friends and family members who have struggled with autoimmune diseases. “This year’s event was a stunning success, as we raised more than $650,000,” said Walker. “We are so grateful to our generous donors and sponsors to make this happen. Anything truly is possible.”

“My niece was diagnosed with type 1 diabetes five years ago,” said PANDA President Heidi Coupland. “And during the planning of this year’s event, one of my daughters was diagnosed with celiac disease. I know what it feels like to have your life turned upside down by illness and I couldn’t be more proud and humbled to represent 150 amazing women who continue to work to improve children’s health.”

“We suspect that both genetic and environmental factors contribute to the cause of autoimmune diseases. With the support of the PANDAs, we hope to make new discoveries that will lead to the development of novel therapies for these perplexing disorders.”

“We have witnessed and learned about the prevalence of diseases like type 1 diabetes and Crohn’s disease are on the rise, and the mechanism underlying this increase is not well known,” said Steele Center director Fayez K. Ghishan, MD. “Their support over the years has significantly and positively impacted the Steele Center’s ability to improve children’s health through research.”

In 2014, the Arizona Elks Majors Projects donated more than $250,000 to the Steele Center as part of their commitment to raise $2.5 million over the next 10 years.

At their mid-year 2014 convention held last October in Phoenix, Steele Center development director Lori Stratton accepted the group’s check for $125,000—the final of two donations for the year.

“We are so grateful for all the Elks lodges who work hard during the year to raise funds for the Steele Center,” said Stratton. “It was amazing to attend their convention and witness their outpouring of support. I continue to be inspired by their commitment and generosity.”

Of their $2.5 million commitment, $1 million will support basic science research in autoimmune diseases, such as type 1 diabetes, multiple sclerosis, inflammatory bowel disease and celiac disease. In addition, funds will support clinical research projects at the Steele Center’s new Phoenix location.

The remaining $1.5 million will be used to establish the Arizona Elks Endowed Chair in Statewide Pediatric Research. The endowed chair, once completed, will enable the Steele Center to recruit a top-notch clinical research leader to oversee the clinical research program in Phoenix.

“We are immensely thankful for the Elks’ continuing support,” said Dr. Ghishan.

In 1992, the Arizona Elks Majors Projects began their generous legacy to support the UA Steele Center. Every year since then, lodges across Arizona have organized a variety of fundraising activities such as golf tournaments, hoedowns, motorcycle “poker runs,” toy drives and theme parties, to name just a few. In addition, they have knitted countless beanies and booties for premature babies in the NICU, and have donated thousands of toys and books to the patients at Diamond Children’s and affiliated outpatient clinics.

“The Arizona Elks truly are our partners in improving children’s health,” said Steele Center director Fayez K. Ghishan, MD. “Their support over the years has significantly and positively impacted the Steele Center’s ability to improve children’s health through research.”

A CONTINUING LEGACY: The Arizona Elks Major Projects
In just four years, Kids of Steele have raised about $180,000 for the UA Steele Center. “I’m so impressed with how quickly they’ve grown over the past four years and we are profoundly grateful for their ongoing support,” said Steele Center director Fayez K. Ghishan, MD. “Kids of Steele inspires me with their dedication!”

In November 2014, the group raised $64,000 at their Fourth Annual Miniature Golf Tournament at Golf N’ Stuff. “Our event was a huge success, thanks to the generosity of our sponsors, attendees and special donors,” said Jenny Horn, Kids of Steele event co-chair. “We nearly doubled what we raised last year; and, despite the rainy weather, around 400 children and adults showed up to participate in this fun event.”

Throughout the year, Kids of Steele members take part in a variety of service and fundraising projects.

In 2014, Kids of Steele held the following service projects and events:

Service projects:
- Healthy Snacks: Monthly breakfast table in the pediatric hematology/oncology clinic and an afternoon snack table in the Angel Wing for Children with Diabetes to provide patients and families healthy treats.
- Superhero Sunday: Member families gathered to make superhero capes to lift patients’ spirits.
- Holiday Stockings: With the help of Santa, member families filled and handed out stockings and holiday crafts to the pediatric hematology/oncology clinic, the Angel Wing for Children with Diabetes and to hospitalized children at Diamond Children’s.

Fundraising Events:
- Membership Event: Kids of Steele welcomed 57 member families in 2014; the families also assembled craft kits for patients.
- Team Up with Coach Rodriguez: More than 100 kids participated and took the field with the UA football team. Families donated toys and gift cards for patients.
- Miniature golf tournament: It was a “rockin’” good time for the whole family. The event included a craft project to help patients feel like rock stars.

Funds raised by Kids of Steele are used for Steele Center research projects, physician recruitment and Kids of Steele service projects.

To learn more or get involved with Kids of Steele, please visit kidsofsteele.org.

Kids of Steele 2014 Superhero Members ($500)
Nicole and Adam Churchill
Barbara and Michael Cusick
Adrienne and Jay Foust
Shirley and Eric Geile
Kendell and Jason Hartenbach
Jenny and Matt Horn
Jessica and Bob Huber
Kris and Joe Ingegneri
Wendy and Tom Kurtin
Katie and Tony Milo
Amy and Omar Mireles
Alexis Feder and Victoria Yatsenko RAISE FUNDS for Type 1 Diabetes and Celiac Disease

Students Alexis Feder and Victoria Yatsenko organized a dance performance to raise support for type 1 diabetes and celiac disease research.

Alexis and Victoria organized the entire event as their mitzvah project, which is a component of the bar mitzvah. The event took place at Sahuaro High School on February 8, and was performed by the dance troupe Dance Force-1.

They raised about $3,400 for the Steele Center, and we’re grateful and inspired. Thank you!

What’s more, Kelsey and her nurse Kaitlyn Spradling, RN, started “Bear Down Tuesdays” at Diamond Children’s to lift the spirits of patients, families and staff. Everyone wears red “Bear Down” shirts and other UA clothing.

And Kelsey’s not stopping there. With the help of friends and family, Kelsey organized a fundraiser for pediatric cancer research.

“I’m going to be someone who impacts the world,” Kelsey declared on her blog at www.bpositivetekelsey.com.

“Leukemia has nothin’ on me!”

We couldn’t agree more!

In September, the UA Steele Center in Phoenix officially opened!

The new office is at 4455 E. Camelback Road, Suite E-125.

“Our expansion to Phoenix would not have been possible without the support from the PANDAs and the Arizona Elks Major Projects,” said Steele Center director Faye K. Ghishan, MD. “We are so grateful for their support.”

Currently, Steele Center researchers are working with neonatologists at St. Joseph’s Hospital on a NEC (necrotizing enterocolitis) study and the Arizona Developmental Disabilities Surveillance Program (ADDSP) team is also utilizing the new office for the coordination of its surveillance research.

The UA Department of Pediatrics Welcomed these NEW FACULTY MEMBERS in Calendar Year 2014

Sarah M. Becker, DO
Assistant Professor
Division of Critical Care

Neha Bhasin, MD
Assistant Professor
Division of Hematology /Oncology/BMT

Mo Mortazavi, MD
Assistant Professor
Division of General Pediatrics/Sports Medicine

Brittany Shutes, MD
Assistant Professor
Division of Critical Care
FY2013-2014
FACTS & FIGURES

THANK YOU for your support!

We are so grateful for your investment into the work of the UA Steele Center. Our donors truly are our partners, working together to improve children’s health through research and discovery.

Although federal and state grants help fund scientific investigation, philanthropy is an essential catalyst for nurturing new ideas, serving as a springboard for securing government aid in the future.

The UA Steele Center physicians-scientists focus on investigating the causes of pediatric diseases and work to discover new treatments and therapies for children suffering with illness.

Moreover, our physicists-scientists take care of children throughout Arizona and neighboring states, focusing primarily on difficult-to-treat diseases like pediatric cancers, type 1 diabetes, autism spectrum disorders, congenital heart disease and gastrointestinal disorders, to name a few.


Hillary Franke, MD, MS, associate professor; associate director, Pediatric Residency Program; promoted to associate professor in the Department of Pediatrics and the UA College of Pharmacy, completed the two-year fellowship program in integrative medicine from the UA Center for Integrative Medicine; Publication: Review: Toxic Stress: Effects, Prevention and Treatment. Children 2014, 1(3), 390-402. doi:10.3900/childrenm0390.


Katri Typpo, MD, MPH, assistant professor, Division of Critical Care; Received the “Arizona Health Sciences Center Career Development Award”, invited speaker, SCCM annual conference; invited speaker, NICHID multiple organ dysfunction conference; Publications: book chapter in Pediatric Critical Care Current Concepts, PICU nutrition; Can we change the outcome? Existing data analysis in pediatric critical care research. Frontiers in Pediatrics 2014;2.79. PMCID: PMC4174396

Richard Wahl, MD, professor, Division of General Pediatrics; received joint appointment as professor of psychiatry, Department of Psychiatry and professor of family studies and human development, Norton School of Family Studies.


22

23

Total amount raised: $2.06 million
Types of Donors:
- 52% Corporations
- 48% Foundations
- 40% Individuals

Types of Donations:
- 40% Individuals
- 12% Corporations
- 90% Teaching, healing, discovering
- 11% Clinical support/Diamond Children's
- 12% Annual Fund/Greatest Need

How Philanthropy Funds were Used
- 90% Teaching, healing, discovering
- 10% Administration and fundraising

Where Philanthropy Funds were Directed:
- 15% Endowment
- 2% Recruits
- 4% Education
- 11% Clinical support/Diamond Children's
- 15% Annual Fund/Greatest Need

Thank You!

We appreciate every gift made to the UA Steele Children's Research Center. It is the kindness and generosity of our donors that allows us to provide today's care and tomorrow's cures to children throughout Arizona. We want to give special thanks to the following donors who gave $1,000 or more from January through December 2014.

$250,000 - Ariana Eks Major Projects
Jacqueline Cowin & Family
PANDA - Phoenix Women's Board
Father of the Year 2014

$100,000 - $249,999
Angela Hurley for Children, Inc.
Father's Day Council Tucson

$50,000 - $99,999
Armstrong McDonald Foundation
Tom Rogers and Ginny Clements
Bennett and Jacquelynn
Dorrance–The Dorrance Family
Deanna C. Evenchik

$25,000 - $49,999
4SEU Enterprises LLC – SportsClips
Alicia and Stephen Alexander
Alwin and Janice Kivel

$15,000 - $24,999
Anonymous
Arlene and Robert Weiss

$10,000 - $14,999
Arizona and Maricopa Counties
Barbara L. Cantor

$5,000 - $9,999
Aramark
Robert and Janet Bohannan
BBVA Compass Bank Foundation
Robert and Patricia Babbitt
David and Sherry Baker

$2,500 - $4,999
Erin Ashley
Arizona Public Service
Paul and Alice Baker

$1,000 - $2,499
Acorn Associates Architecture, Ltd.
Adela Phoenix
Advanced F&M Solutions
A Galaxy Construction, Inc.
Kristin Gose and Wendy Alexanders
Robert and Sydney Andersen
Ars Paraseghian Medical Research Fdn.
Articena Group, LLC

$500,000 - $999,999
Father of the Year 2014

$100,000 - $249,999
Father's Day Council Tucson

$2,500 - $4,999
Barbara L. Cantor

$1,000 - $2,499
Acorn Associates Architecture, Ltd.
Adela Phoenix
Advanced F&M Solutions
A Galaxy Construction, Inc.
Kristin Gose and Wendy Alexanders
Robert and Sydney Andersen
Ars Paraseghian Medical Research Fdn.