

STEELE CHILDREN'S RESEARCH CENTER



2004 REPORT

*Searching for the
Genetic Clues to
Crohn's Disease*

*Beta Cell
Replacement:
Cutting-edge
Diabetes
Research*

*Collaborating
with China:
Acupuncture &
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*Ancient Indian
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*Why Does
Oxygen Hurt
the Lungs of
Premature
Babies?*

THE UNIVERSITY OF
ARIZONA[®]
HEALTH SCIENCES CENTER

A "MUST READ" FOR EVERY GROWN-UP WHO CARES ABOUT KIDS



IN LOVING MEMORY

This annual report is dedicated to the memory of Carlos Valencia.

Tucson loved him as if he were our own. And in a way, he was. For four years, we held our breath while he was treated for leukemia, celebrated his remission, wept when he relapsed and eventually mourned his death. He captured our hearts in a way few others have. But he never forgot to give thanks or to recognize other children and other families with cancer. When the disease took him away this year, at age 16, Tucson honored him with a funeral fit for a prince. It was a fitting tribute to a short life, well-lived.



Today's care...tomorrow's cures



Steele Children's Research Center

The Steele Children's Research Center is a place where internationally recognized researchers work together to solve the medical problems of children. Our pediatricians, who also are faculty members in The University of Arizona Department of Pediatrics, play a unique role in the community—as physicians, researchers and teachers. Our goal is to advance medical knowledge to help improve the health of Arizona's children and children throughout the world.

Dedicated in 1992, the Steele Children's Research Center was built with private funds to advance the health concerns of children. The Steele Center was named in honor of the late Horace W. Steele of Phoenix. The Steele Foundation donated \$2 million to help build the Steele Children's Research Center. We continue to thrive with the support of the community.

Only 14 percent of the Steele Center's budget is covered by state dollars. The rest comes from clinical income, research grants and philanthropic support.

To learn more about the Steele Children's Research Center, please visit our Web site at www.steelecenter.arizona.edu. The Steele Center is proud to be one of the centers of excellence at The University of Arizona College of Medicine.

TO TEACH, TO HEAL, TO DISCOVER

Our Mission, Our Vision: Letter from the Director

As I re-examine our mission, "To teach, to heal, to discover," I am reminded how interconnected these three areas are for improving the health of our children. The vital relationship between clinical care, research and teaching is the foundation of a great academic medical institution.

With our mission in mind, I want to share with you my vision for the next five to 10 years.

The Department of Pediatrics has risen to 21st in the latest National Institutes of Health (NIH) national rankings. That's up from our ranking of 65 almost 10 years ago! This is powerful evidence of our commitment to finding cures for childhood diseases through research. I believe we can become one of the top 10 pediatric departments in the nation within the next five to 10 years. How will we accomplish this? By increasing our faculty by 50 percent. This will enable us to move into the post-genomic era of research.

Research ("To Discover")

In 2004, The University of Arizona College of Medicine identified four priority research areas: diabetes, cancer, human neurological sciences and cardiovascular disease. Not surprisingly, the Steele Center will excel in each of these areas.

For many years, we have been conducting cutting-edge research in juvenile diabetes. Our plans include recruiting three molecular endocrinologists to investigate beta cell biology and autoimmunity. In pediatric cancer research, Steele Center researchers continue to explore and develop new ways to treat children with cancer. And I am happy to report that the Louise Thomas Endowed Chair in Pediatric Cancer Research soon will be a reality, as we have begun the recruitment process to hire a top-notch physician/scientist to lead our pediatric cancer research program. In neurology, we have been investigating causes and treatments of the devastating neurodegenerative disease Niemann-Pick Type C for nearly a decade. In the area of cardiovascular disease, Steele Center researchers are studying early heart development with the hope of designing innovative new treatments to rescue young hearts from congenital heart defects. In addition, with new NIH grants for pediatric gastroenterology, we will be exploring novel therapies for Inflammatory Bowel Disease and discovering how iron deficiencies alter our genome.

Clinical Care ("To Heal")

Our clinical excellence also has been recognized by the College of Medicine. The Strategic Planning Committee, under the leadership of our new dean, Dr. Keith Joiner, has designated the area of Pediatrics as one of its two top clinical priorities. What does this mean? We now have the commitment of the College of Medicine to strategically invest in our pediatric infrastructure. We will expand both our inpatient and outpatient facilities and make use of cutting-edge telemedicine and new computer technologies to reach our patients living in remote areas.

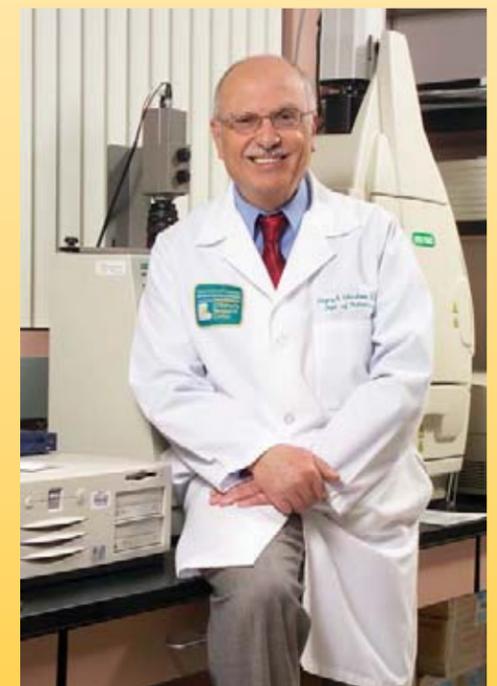
Teaching ("To Teach")

Training the next generation of pediatricians and physician/scientists is integral to the overall success of our program. Every year, many of our faculty receive awards for outstanding teaching of residents and medical students. I am grateful for our dedicated faculty who work tirelessly to train our new physician/scientists. And, our residency program continues to thrive. For example, we recently partnered with the Department of Emergency Medicine to establish a newly accredited combined residency training program in emergency medicine and pediatrics. This dual program is one of only three in the country.

Our commitment to teach, to heal and to discover is critical as the College of Medicine expands its medical education and research program to Phoenix. With our strong network of support already established in Phoenix, the Department of Pediatrics and the Steele Center will play a central role. I am confident that this expansion will deliver incredible benefits for Arizona and the health of all our citizens.

We could not be where we are today without the support of our Steele Center friends. It has been a privilege this year to visit with many of you—at events, volunteer meetings, or even walking in Sabino Canyon. Through your generosity, friendship and support, together we will improve the health of our children. I thank you from the bottom of my heart.

Faye K. Ghishan, MD
Horace W. Steele Endowed Chair in Pediatric Research
Director, Steele Children's Research Center
Professor and Head, UA Department of Pediatrics





FATHER'S DAY COUNCIL OF TUCSON

In 2004, Father's Day Council of Tucson celebrated their 10th anniversary in style—by breaking its previous fundraising record.

The Fathers of the Year event honors six prominent Tucsonans each year because they are excellent fathers, successful in their professions and dedicated to their communities. Almost 150 businesses and individuals pay tribute to these individuals with a congratulatory message in the program. The June event sells out every year. Those who attend are treated to a heartwarming salute to family and fatherhood.

This gala dinner not only honors outstanding fathers, it also raises money to help children with juvenile diabetes. Thanks to the hard work of volunteer organizers, last year's event raised about \$175,000 for juvenile diabetes research, bringing the Father's Day total donated to the Steele Children's Research Center to over \$1 million. Their work over the past decade has funded important equipment for the diabetes clinic, dietician and nurse educator services, and numerous research projects which have increased scientific knowledge about type 1 diabetes.

If you would like to learn more about the Father's Day Council, please contact Richard Schaefer at (520) 299-4444.

Treatment of Type 1 Diabetes through Beta Cell Replacement

Do you know why children with type 1 diabetes can't produce their own insulin?

Inside the pancreas are groups of cells called islets. Within the islets are beta cells—the cells responsible for producing insulin. Glucose (blood sugar) enters the bloodstream and proceeds to the pancreas where it is sensed by the islet cells. The beta cells within the islets respond by producing insulin, which communicates with other cells to utilize glucose. In type 1 diabetes, the beta cells are damaged or destroyed by the immune system and, therefore, can't produce insulin.

Wouldn't it be great if children with type 1 diabetes could be treated so that they could once again produce their own insulin?

One day, these children will be able to, if Steele Center researchers Stuart Williams, PhD, Professor of Biomedical Engineering, and James Hoying, PhD, Associate Professor of Biomedical Engineering, are successful. The key is "beta cell replacement," which involves the transplantation of healthy insulin-producing beta cells into a diabetic patient, with the hope that the new beta cells will start producing insulin. It sounds straightforward, but the process is complicated. According to Dr. Hoying, "There are two separate challenges to overcome in the transplantation of islet cells."

Drs. James Hoying and Stuart Williams.



The first challenge is to protect the transplanted islets from being attacked by the immune system. To deal with this challenge, Drs. Williams and Hoying have developed a special "immunoisolation device" to house healthy beta cells. The device is a small pouch, constructed from a unique fabric-like material that looks like a small tea bag about the size of a fingernail. "The porous material of the pouch allows glucose in, insulin out, and does not allow immune cells to come in and attack the islets," explains Dr. Williams. Testing of the device is currently under way, thanks to funding by the Father's Day Council of Tucson and the Sara Courtney Memorial Walk/Run.

However, once the pouch with transplanted islets is in place, a second challenge materializes. "What we find is that, after a few months, the amount of insulin produced begins to decrease, and everything inside the immunoisolation device dies," says Dr. Williams. "There is a lack of blood supply that is required for cell life." To solve this problem, they are attempting to combine biomaterials with a pre-built blood supply to better support the implanted device. This second stage of research is funded by the Active Women's 20/30 Club. Dr. Hoying explains: "We isolate capillary (blood vessel) fragments from fat tissue, since fat tissue has a good blood supply. We insert them into a natural collagen 'matrix' (a jello-like substance found in skin), and the vessels undergo spontaneous blood vessel growth, known as angiogenesis. Thus, new blood vessels are created."

The immunoisolation device, surrounded by these new blood vessels, then can be transplanted into tissue, possibly under the skin, into a muscle or even the kidney. "Those newly implanted vessels will continue to grow, and soon attach to the vessels of the surrounding tissue. They start to carry blood, and a new blood supply develops, ensuring the viability of the immunoisolation device," explains Dr. Hoying. "This means that the device will be seen as a natural part of the body's system and will not activate the 'foreign body' response."

Drs. Williams and Hoying are confident that their immunoisolation device someday will enable children with type 1 diabetes to start producing their own insulin. That will be a great day.



The immunoisolation device developed by Drs. Williams and Hoying.



THE SARA COURTNEY MEMORIAL WALK/RUN

The Sara Courtney Memorial Walk/Run was founded in 2004 after the untimely death of 26-year-old Sara Courtney due to diabetes complications. The origin of this event is rooted deeply in love and friendship for this young woman and for her mother, Ann Courtney. Volunteers marshaled a few short months after the tragedy, determined to create a legacy of hope in Sara's honor. Together, they spent countless hours creating the walk/run, managing logistics and marketing to the community.

Early on a Saturday morning in May, scores of volunteers and more than 500 participants gathered in Sabino Canyon to walk in support of Sara's family and the 1 million other young people in the U.S. who manage type 1 diabetes. The atmosphere was festive with runners in friendly competition, workmates walking together, families with strollers and even a team of police recruits running their weekly workout for the cause. After completing the course, everyone recharged with refreshments and enjoyed cheering at the awards ceremony. And everyone felt like a winner for having helped this incredible debut event raise \$45,000 for research to improve treatments and find an eventual cure for this chronic disease.

The second annual Sara Courtney Memorial Walk/Run will take place on Saturday, May 7th. If you would like to participate, or learn more about Sara's Walk, visit their Web site at: www.walkforsara.com.



THE ACTIVE WOMEN'S 20/30 CLUB

With the mission of improving the quality of life for the special needs of children in the community, the impressive young women of the Active Women's 20/30 Club have faithfully supported the Steele Children's Research Center since 1988. Their trademark event is Casino Night, a festive evening of gourmet food sampling, live music, a silent auction and casino-style gaming.

Each year the club evaluates several research proposals and carefully chooses which scientific project they will support for that year. Past projects have included genetic research into the cause of SIDS (Sudden Infant Death Syndrome), analysis of congenital heart defects in Down Syndrome patients, and survey studies to break the cycle of domestic violence. The 2004 project focused on diabetes in honor of 20/30 Club member Sara Courtney, who lost her life to diabetes complications in the fall of 2003.

In 1992, 20/30 established a mini-endowment dedicated to improving the health and well-being of children in Arizona and throughout the world. The endowment was later named in memory of former Club President Melody Luyties, who lost her battle with cancer in 1999. As the Luyties Endowment grows, it will generate funds for pediatric research to help our children far into the future.

To learn more about the Active Women's 20/30 Club, call Kameron Rutschman at: (520) 882-2222.

New Research May Lead to Preventing Type 1 Diabetes

Every year, about one of every 400 children is diagnosed with type 1 diabetes. It can be a daunting disease requiring constant vigilance to keep under control. Children with type 1 diabetes must take daily insulin injections, monitor their blood sugar, and eat a balanced diet. Individuals with diabetes are at greater risk for heart disease, stroke, blindness, kidney failure and other health complications.

What if type 1 diabetes could be prevented or delayed?

Liqun Bai, MD, Research Assistant Professor of Pediatrics and Steele Center researcher is exploring ways to prevent type 1 diabetes. His latest research project is supported by the Sara Courtney Memorial Walk/Run and the Father's Day Council, which has been funding type 1 diabetes research projects for a decade. Dr. Bai is examining the role specific genes play in the cause of type 1 diabetes.

"We know that type 1 diabetes results from the destruction of beta cells—the cells in the pancreas responsible for creating insulin," says Dr. Bai. "We're interested in looking at the processes involved in the destruction of those cells from a genetic perspective."

Although many genes contribute to the initiation of diabetes, Dr. Bai is exploring one gene in particular—Fas. Fas is a cell receptor gene, part of a family of adapter proteins known as tumor necrosis factor receptors (TNFR), which play a role in cell death. A previous study showed increased Fas levels in individuals with type 1 diabetes. Dr. Bai believes that by decreasing the amount of Fas in the body, type 1 diabetes can be prevented, or at least delayed.

"Since Fas is expressed throughout the body and plays an immunological role in other normal cellular functions, we can't simply target all Fas," explains Dr. Bai. "We need to specifically block the Fas in the pancreatic beta cells." Dr. Bai plans to use a "gene knockdown technique" called small interfering RNA (siRNA). When siRNA is delivered to the blood system, it targets Fas in the beta cells instead of affecting the whole system. SiRNA binds with Fas and blocks it from destroying insulin-producing beta cells while avoiding system-wide damage.

Using a mouse model, Dr. Bai will use an insulin promoter (a fragment of DNA) that specifically directs siRNA into the beta cells of NOD (non-obese diabetic) mice. "We would expect to see change by blocking the Fas pathway. And this should prevent or delay the onset of type 1 diabetes," says Dr. Bai. "The results from this study are likely to open doors for a possible cure for individuals with type 1 diabetes." It may be sooner than we think.



Getting to the Genetic Heart of the Matter

Congenital heart defects are the number one cause of death from birth defects during a child's first year of life. In the United States, more children die from congenital heart disease each year than from all forms of childhood cancers combined. In fact, about one out of every 125 children is born each year with a congenital heart defect.

Although the causes of most congenital heart defects are unknown, researchers believe heart problems result from genetic and/or environmental factors.

Pediatric cardiologist Brent Barber, MD, began traveling to Panama as a fellow at Oregon Health & Science University to investigate the genetic factors associated with a congenital heart disease known as Total Anomalous Pulmonary Venous Return (TAPVR). Now an Assistant Professor of Clinical Pediatrics at The University of Arizona, Dr. Barber continues his research and travels to Panama with support from The Joseph and Mary Cacioppo Foundation.

Found primarily in newborns and infants, TAPVR occurs when the vessels carrying oxygen-rich blood back to the heart from the lungs are connected incorrectly. Without surgery, about 85 percent of these children will die within the first year of life.

Why Panama? "There is a group of indigenous people in the northeast region of Panama known as the Kuna who have a very high rate of TAPVR," explains Dr. Barber. "In fact, approximately 80-90 percent of all TAPVR cases in Panama come from the relatively small Kuna population. From a genetic perspective, this is very interesting," he says.

"Studying this group of people with such an apparently high incidence of this specific heart defect increases our likelihood of discovering the causative gene," says Dr. Barber. "By identifying the genetic mutations associated with TAPVR in the Kuna population, we hope eventually to be able to identify families at risk for having children with this defect. With this information we can develop appropriate genetic counseling and, by identifying affected children at a younger age, hopefully we can improve their survival rates."

If Dr. Barber's research determines a gene responsible for TAPVR, the next stage would be to clone it for further study. "We would then be able to study the role the gene plays in heart development, which could lead to a greater understanding of cardiac development and potentially lead to genetically targeted treatments of TAPVR and other congenital heart defects."



THE JOSEPH & MARY CACIOPPO FOUNDATION

As Executive Director of The Joseph and Mary Cacioppo Foundation, Michael-Anne Young represents philanthropy's newest generation. Since its inception in 1983, the family-based Cacioppo Foundation has built a portfolio of grants that are given to nearly 200 deserving non-profits across the United States each year. Beginning with its first grant round, the Foundation has supported a broad-based class of non-profit organizations.

"Because we take an active role in our grant-making process, we are able to see first hand the positive outcomes achieved by such outstanding organizations. We feel privileged to be part of so many worthy efforts taking place on behalf of such a diverse population," said Michael-Anne.

The Cacioppo Foundation has been a faithful supporter of the Steele Center since the mid-80s. Their grants are directed toward young investigators with innovative ideas for new research.



Dr. Barber with a young patient in Panama.

ARIZONA ELKS



The Arizona Elks Major Projects, Inc. (AEMP) has supported the Steele Children's Research Center for over a decade, with cumulative giving topping \$3 million.

Research has been the primary focus of the Elks giving. During the initial capital campaign to build the Steele Center, AEMP underwrote the cost of an entire wing of three laboratories. During the early years of growth at the Steele Center, Arizona Elks Seed Awards gave fledgling research projects and young investigators a boost.

In addition to their long-term research investment, the Elks wanted to help children today, so they funded a massive renovation of the pediatric clinic, now known as the Arizona Elks Clinic for Children and Young Adults. And to help train pediatricians, the Elks underwrote the creation of the Marvin Lewis Pediatric Teaching Center.

The Elks have established a special affinity for our tiniest patients, the premature babies in the neonatal intensive care unit (NICU). Ladies knit miniature booties, caps and blankets for use in the NICU. Arizona Elks Seed Awards have underwritten research into breast milk composition and infection prevention in neonates.

On the 10th Anniversary of the Steele Center, the AEMP President announced a bold new goal to fund the Arizona Elks Endowed Chair in Neonatology. More than \$800,000 of the \$2 million commitment has been donated. This Chair will exist in perpetuity, supporting research that will make life better for these fragile infants.

Want to learn more about the Arizona Elks Major Projects? Check out their Web site at: www.elks4kids.org.

Too Much of a Good Thing: *Understanding the Role Oxygen Plays in Newborn Lung Disease*



Here's the good news: advances in neonatal intensive care over the past 20 years have increased the survival rates of babies born prematurely.

Here's the bad news: even though more premature babies survive, many will suffer from a chronic lung disease known as Bronchopulmonary Dysplasia (BPD). In fact, it is the major complication of premature birth.

BPD is caused by prematurity and hyperoxia—too much oxygen in the lungs. Because premature babies' lungs have not fully developed, they must be put on ventilators and given extra oxygen to help them breathe. Unfortunately, the very oxygen necessary for survival often damages their lungs—resulting in BPD.

Why does oxygen hurt the lungs of premature babies? We don't really know. We do know that the lungs are very susceptible to injury. The lungs are one of the last organs to develop. While the heart is fully developed by the seventh week of gestation,

"We know that too much oxygen in the lungs stops lung cells from dividing, which then alters the growth and development of the lung."

the lungs do not really begin to develop until approximately the thirty-fourth week of gestation. So the lungs are at risk for premature babies—who are born before the thirty-seventh week of gestation. Because the lungs are so poorly developed, they seem to be especially sensitive to oxygen.

To understand this problem, Jonathan Wispé, MD, Professor of Pediatrics and the Arizona Elks Endowed Chair in Neonatology, is researching how hyperoxia disrupts normal lung development in premature newborns. "We know that BPD can cause lifelong respiratory difficulties and is associated with poor growth, delayed development, and repeated hospitalizations. I'm interested in discovering what the mechanisms of injury are," says Dr. Wispé.

To determine the mechanisms of lung injury, Dr. Wispé is exploring the factors that regulate normal lung development and how hyperoxia upsets that process. "We know that too much oxygen in the lungs stops lung cells from dividing, which then alters the growth and development of the lung. What we don't know is why the cells stop dividing," explains Dr. Wispé. "If we can identify the genetic mechanisms that cause the cells to stop dividing, we'll be able to identify ways to prevent it."

The research study is based on the hypothesis that Keratinocyte Growth Factor (KGF) protects the lung from oxygen damage. KGF is a naturally occurring protein that is important in normal lung development and is known to protect the adult lung against oxygen damage.

To test his hypothesis, Dr. Wispé will use a mouse model because their lungs develop along the same time frame as a human model. These "transgenic" mice, as they are called, are special: they have been genetically altered to be born with additional KGF. "This will enable us to test whether or not their lungs will be protected from the damaging effects of

oxygen on the lungs," says Dr. Wispé.

So far, the testing that has been conducted on the transgenic mice has shown that KGF does protect the lungs from the harmful effects of oxygen. "This is very exciting," says Dr. Wispé. "But now the question is, 'how does KGF protect the lungs?'"

Dr. Wispé wants to discover which genes are activated and which genes get turned off when there is additional KGF or oxygen. The next step would be to identify what these genes are doing to lung development. "We hope to show that KGF prevents bad genes from being activated, and good genes from being deactivated," explains Dr. Wispé. "Potentially, if we can identify those good genes needed to protect the lungs from damage, we'll ultimately be able to develop a gene product that can be given to premature babies, protecting them from the damaging effects of oxygen on the lungs."



Lizzie's Loot: *The Gift of Toys*

Let's face it, kids love toys! For Lizzie Bell, a vibrant little girl who loves to sing, dance, perform skits and drink white-chocolate mochas, receiving a free toy after bi-weekly blood transfusions is a big deal. So much so, that she convinced her school to donate toys to keep the toy box filled at the Arizona Elks Clinic for Children and Young Adults. Thus was born "Lizzie's Loot"—a fundraiser that raises money for practical things that will "make a difference for the kids and help families out," says her mom, Kathy Bell.

Lizzie has Diamond-Blackfan Anemia (DBA), a rare genetic disease resulting in a very low number of red blood cells. Consequently, Lizzie is dependent on blood transfusions. So, every other week Lizzie and her parents head to the Arizona Elks Clinic to get Lizzie's transfusion. "All of the kids who receive chemotherapy and transfusions get a toy after their treatment," says Lizzie. "Lizzie's Loot" is one way the toy box stays filled and the kids happy.

But Lizzie didn't stop with toys. "Lizzie's Loot" continues to grow, raising money to purchase MedWagons (wagons that children ride in while in the hospital), Make-A-Wish "wish" books, and other practical items for children and their families.



DR. FAYEZ K. GHISHAN HONORED

with the 2004 Shwachman Award

I am honored to present **Dr. Fayez K. Ghishan**, the recipient of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition's highest honor, the **Shwachman Award** for 2004. The annual Shwachman Award honors a NASPGHAN member who has made major, life-long scientific or educational contributions to the field of pediatric gastroenterology, hepatology and nutrition in North America.

Dr. Ghishan was born in Jordan. A photograph from his childhood showing a well-dressed young boy with neatly combed hair, a jacket, tie and briefcase presages his reputation for formal attire, a gentlemanly demeanor and a scholarly attitude that has characterized his personal and professional life. He attended medical school

at Ankara University in Turkey. He sought house officer training at the Royal Cornwall Hospital in England and later at Pennsylvania State University. He was a gastroenterology fellow and NIH postdoctoral trainee at the University of Iowa. His productivity during fellowship training was remarkable, resulting in 12 publications from work accomplished during two years of training.

In 1979, Dr. Ghishan joined Vanderbilt University School of Medicine. In 1982, he was voted the Amos Christie Outstanding Teacher of the Year by the Vanderbilt pediatric housestaff. In the same year, Dr. Ghishan was awarded his first NIH grant. He quickly ascended the academic ranks as one of Vanderbilt's most prolific clinicians, enthusiastic teachers and productive scientists. He was named Director of the Division of Pediatric Gastroenterology at Vanderbilt in 1986 and Vice-Chair for Research in 1989. In 1995, he was recruited to The University of Arizona as Chair of Pediatrics and Director of the Steele Children's Research Center. Dr. Ghishan has increased NIH funding in his Department almost six fold since 1996.

Dr. Ghishan has made extraordinary contributions to the science and practice of pediatric gastroenterology. He has published 183 manuscripts in peer-reviewed literature. He cloned a human intestinal sodium-phosphate transporter gene and has extensively characterized the structure, function and regulation of a variety of other sodium-phosphate transporters.

The NIH has continuously funded Dr Ghishan's research for more than two decades and granted him a MERIT Award in 1996. This funding mechanism is awarded to fewer than 5% of NIH investigators. The awards provide the opportunity for 10 consecutive years of federal support. Dr. Ghishan has served the gastroenterology community with extensive commitment to NIH review panels. He is currently on the editorial board of the *American Journal of Physiology* and was recently selected as an Associate Editor for the seminal text, *Physiology of the Gastrointestinal Tract, Fourth Edition*.

We are fortunate to have exceptional leaders like Dr. Ghishan in our organization and look forward to many more years of his sage influence and productive contributions to our field.

John A. Barnard, MD
President-Elect, NASPGHAN

Seven-year-old Fayez K. Ghishan in front of his home in Jordan.

Called to Make a Difference: *Young Students Raise Funds for Cancer Research*

Desert Christian Middle School students select a theme each year: For 2004, their theme was "Called to Make a Difference." The students, faculty and staff wanted to make a difference in the life of their friend and classmate Hannah Bachelder by having a fundraiser to support cancer research. Hannah was diagnosed with medulloblastoma (a brain tumor) at the age of 14.

"What better way to support their classmate, contribute to a good cause, and have fun at the same time?" says Dennis O'Reilly, the school's principal.

On October 22, 2004, 150 energetic students walked and jogged laps around the track at Udall Park. They raised more than \$12,500 to support the pediatric cancer research team at the Steele Center.

These students truly have made a difference.



Hannah (seated, in center) and her friends from Desert Christian Middle School.

Community Education: *Reaching Out to Parents*



Morning for
Children's Health

All parents want what's best for their children. But many are on information overload. How do you evaluate the latest information and decide what will work for your family? About 150 parents (mostly moms) spent a morning in April sorting things out. They learned:

- Which alternative therapies are safe and effective for children
- New ways to gain family cooperation
- How to create nutritious meals on the go
- New techniques to talk to your kids about sex (more than once)

Hosted by the Steele Children's Research Center and supported by Canyon Ranch and University Medical Center, the Morning for Children's Health featured doctors from the UA Department of Pediatrics and other local professionals who work with children. It was a morning of food, fun and good information.

"Being a parent is one of those things you can always do better," says Kathleen Kirk-Anderson, Steele Center board member and chair of the event. "We were so pleased to offer this fun and interesting event to the community and especially to be able to offer scholarships to allow more parents and teachers to attend."



TEE UP FOR TOTS

Each year under the August sun, dedicated golfers hit the links to honor the memory of a little girl and to help find a cure for cancer.

For the past six years, the TUFT golf tournament has been held on the Friday closest to Courtney Zillman's birthday. After a valiant battle, a neuroblastoma tumor took Courtney's life at the age of 4. Tee Up for Tots honors this little girl with the bigger-than-life personality by raising funds to battle pediatric cancer. Known as one of the best charity golfing events in the region, Tee Up for Tots sells out months ahead of time.

Funds raised for research support two Courtney Page Zillman Fellows. Thanks to Tee Up For Tots, these young investigators are given the opportunity to launch promising research careers. Second-year Zillman Fellows Ryan Falsey and Xinchun Chen, MD, are each producing impressive results in their chosen areas of cancer study.

Like to learn more? Check out their Web site at: www.teeupfortots.org.

Ancient Indian Plant— Cancer Drug of the Future?

For the past two years, Tee Up for Tots Courtney Page Zillman Fellow Ryan Falsey, PhD candidate, has been busy exploring the anticancer effects of winter cherry—a plant that has been used for more than 3,000 years in the Ayurvedic system of Indian medicine.

"Ashwagandha"—the medicinal extract produced from winter cherry has been used in India for thousands of years as a tonic for several ailments including inflammation, insomnia, infertility, anxiety and cognitive disorders. Its proponents claim it boosts energy, promotes relaxation, combats stress and improves memory.

But cure cancer? "Doctors of Ayurvedic medicine have used winter cherry to treat cancer for years, but its use is not well recorded," explains Falsey. "Most of the information has been passed on from generation to generation, so, *how* it works has never been scientifically documented."

What has been documented, however, is the discovery that a compound within winter cherry—Withaferin A—is a powerful withanolide, the medicinal agent in winter cherry.

There have been previous studies on Withaferin A over the past years, but none has been able to identify its mechanism of action, that is, what makes Withaferin A have anticancer effects. And this is the goal of Falsey's research: to identify the mechanism of action of Withaferin A and evaluate its therapeutic potential in cancer treatment.

"Through our research, we have found that Withaferin A has demonstrated significant anti-cancer activity both in the test tube and in animal studies," says Falsey. For instance, mice were implanted with Ewing's sarcoma tumors and treated for 10 days with Withaferin A. After 10 days there was a 66 percent growth inhibition in the tumors treated with Withaferin A. "So now we know that it has this extraordinary ability to kill cancer cells, and we have worked



hard to identify what the mechanism of action is," says Falsey.

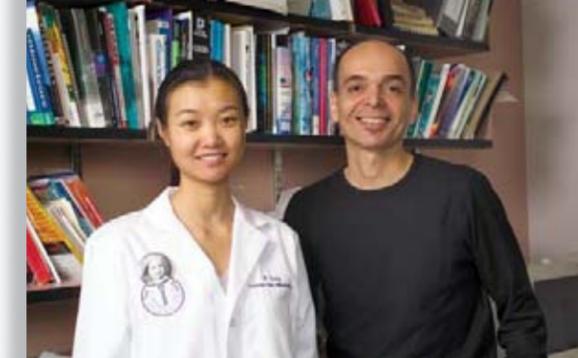
Their hard work has paid off. Under the guidance of Luke Whitesell, MD, Falsey and his team of investigators recently discovered the mechanism of action for Withaferin A. They found that Withaferin A binds to Annexin 2, a protein that has been implicated in cancer growth. Withaferin A manipulates Annexin 2 in such a way that it is toxic to cancer cells, and causes them to die.

"What's promising about Withaferin A," says Falsey "is that it has the potential to be a less toxic chemotherapy. This will be verified through future clinical studies. If we can show that this compound is more effective and less toxic to cancer patients, Withaferin A will be a strong candidate for cancer therapy."

Falsey is enrolled in The University of Arizona's combined MD/PhD program and will be completing his PhD in cancer biology this May. He begins medical school in July and will continue investigating the anti-cancer effects of winter cherry. "This research wouldn't be happening without the generous support of Tee Up For Tots. I'm grateful for this opportunity to explore new and less toxic ways to treat children with cancer."



Zillman Fellow Xinchun Chen, MD, Kathy Zillman, Zillman fellow Ryan Falsey, PhD candidate, and Jerry Zillman.



Yi Zeng, PhD,
and Emmanuel
Katsanis, MD.

Research Yields the Highest Returns

Wouldn't you like to have an investment that yielded exponential returns in only a few years? Tee Up For Tots did just that by investing in the Courtney Page Zillman Research Fellows program.

Each year TUFT pays salary and tuition for two research fellows at the Steele Children's Research Center. Each fellowship is for two years. Researcher Yi Zeng, PhD, started her career in the Dr. Emmanuel Katsanis cancer lab in 2001 as one of the first Zillman Fellows.

During this time, Zeng along with other members of the Katsanis laboratory published information about their research in several scientific journal articles. Each time TUFT was acknowledged as a contributor. In the field of medical research, publications serve a few functions: they validate the work of the research group, they advance knowledge in the scientific community, and they give raw data the credibility needed to be seriously considered for grant awards.

The last part about data credibility for grants proved very important for TUFT from an "investment" point of view. In today's economic climate, new grant awards, particularly from prestigious institutions such as the National Institutes of Health, are extremely difficult to win. Grants that include published initial findings are scored much more highly in the evaluation process.

TUFT-funded research was critical to several grant submissions by Dr. Katsanis, which resulted in awards of more than \$2 million! The most important of these is an NIH (National Institutes of Health) RO1 research grant, one of the most prestigious a scientific laboratory can have.

Another major benefit that TUFT-supported grant awards provide is leverage. Success begets success. In the four years that TUFT has invested in research fellows, Dr. Emmanuel Katsanis' laboratory has been able to increase significantly the number of investigators working to cure cancer, from four to currently 10.

Sometimes donors want to put their name on research equipment or a laboratory. While tools and facilities are important, Dr. Katsanis believes, "The long-term return comes from launching the careers of young investigators. The Tee Up For Tots Zillman Fellows program is invaluable. Funding researchers ultimately has a much more significant and valuable impact."

And in this case, TUFT's multi-million-dollar return is more than monetary. Better cancer treatments and hope for a cure will benefit generations to come.

The value of a young mother's smile when her child goes into remission? Priceless.

UPDATE:

The Louise Thomas Endowed Chair in Pediatric Cancer Research



We're almost there!

Thanks to so many generous contributions to the Louise Thomas Endowed Chair in Pediatric Cancer Research, our goal of reaching \$2 million almost has been accomplished. The endowed chair will provide funding for Steele Center researchers dedicated to discovering better ways to treat children with cancer.

The inspiration for the endowed chair is Louise Thomas, a guiding light and driving force behind the Steele Center, and a passionate advocate for children's health. The Louise Thomas Endowed Chair started with generous gifts from Eddie and Nadine Basha and Mel and Enid Zuckerman.

To date, \$1.5 million has been contributed. Our hope is to fill the endowed chair by the end of 2005. We know we can reach this goal with your help.

If you are interested in making a contribution to help children with cancer, please contact Jane Prescott-Smith, Development Director of the Steele Children's Research Center, at (520) 626-7799, or via email at: jane-ps@peds.arizona.edu. To learn more about the Louise Thomas Endowed Chair, visit www.steelecenter.arizona.edu/lthomaspledge.htm.



**RAISE A
RACQUET
for Kids**

DONOR HIGHLIGHT:

Raise a Racquet for Kids Serves up a Winning Game for Pediatric Cancer Research

Molecular biologist and former tennis pro Anne Fritz wants to beat childhood cancer. So she developed a winning game plan by combining her two passions: research and tennis.

The result?

Raise a Racquet for Kids (RARK), a fun, family-centered tennis fundraising event that raises money for pediatric cancer research taking place at the Steele Children's Research Center.

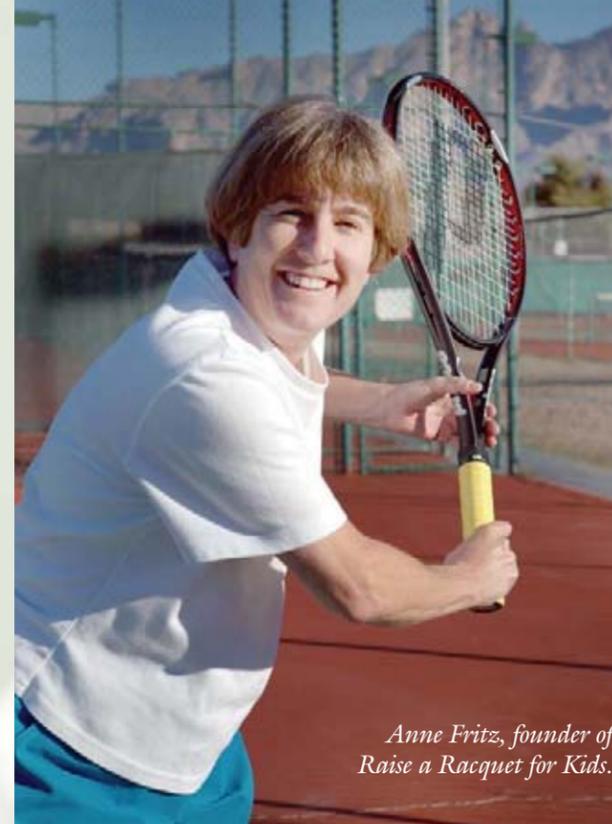
History

Anne played professional tennis for four years and spent 10 years as a teaching pro in many different settings. She taught and ran programs for adults and children at resorts and tennis clubs in New York, Arizona and California. She also was involved in grassroots programs that introduced the game to disadvantaged inner-city kids.

Ready for a career change, Anne moved to Tucson and enrolled at The University of Arizona, where she developed a keen interest in cell biology and chose to major in Molecular and Cellular Biology. While a student, she worked in the research lab of Steele Center pediatric oncologist Luke Whitesell, MD, Associate Professor of Pediatrics. After graduating, she continued to work for Dr. Whitesell as a research technician.

Anne was inspired by Dr. Whitesell and his colleague, pediatric oncologist Rochelle Bagatell, MD, Assistant Professor of Pediatrics. "Seeing how incredibly hard they work, their dedication to patients and commitment to research, motivated me to do something tangible beyond the lab bench," says Fritz. "I wanted to help Drs. Whitesell and Bagatell in a way that would have an immediate impact on children."

Thus was born the idea for a fundraiser. For Anne, it was natural to incorporate her love of tennis into helping kids with cancer.



*Anne Fritz, founder of
Raise a Racquet for Kids.*

Raise a Racquet for Kids!

Raise a Racquet for Kids is a volunteer organization dedicated to finding better and less toxic ways to treat children with cancer. With this goal in mind, the first RARK fundraiser was launched in October 2002. The format was a smash: a Friday evening outdoor barbecue dinner, silent and live auctions, live musical entertainment and exhibition matches with local-name players. Children won prizes for demonstrating their tennis skills. Saturday's matches included men's, women's and doubles. Prizes for winners were donated by a local tennis shop.

In that first year, Anne Fritz and RARK volunteers raised more than \$23,000 for cancer research. And every year, the fundraiser exceeds expectations. By 2004, the fundraiser had grown significantly, and more than \$44,000 was raised. "The Tucson community enthusiastically supports RARK, so the event has grown every year," says Fritz. In fact, RARK has been so successful that Anne is working to expand the fundraiser to Phoenix within the next couple of years.

Pediatric Cancer Research at the Steele Center

So, what exactly does the money from RARK fund?

Proceeds from RARK help fund a Phase 1 clinical trial that Dr. Bagatell currently is conducting in collaboration with nine other academic medical centers across the U.S. and Canada. The Phase 1 trial is testing a drug known as 17AAG—a novel anticancer drug whose mechanism of action was determined by Dr. Whitesell more than 10 years ago.

*Pediatric oncologist Rochelle Bagatell,
MD, and Shelley Clark, RN, with
patient Hannah Bachelder.*



A Phase 1 trial is a "dose-finding study"—a study to find out the safe dose range of the new drug—to determine how much of the drug can be tolerated. Phase 1 trials typically are small, recruiting about 30 patients. "So far, we have enrolled eight children in this trial," says Dr. Bagatell. For many children whose cancer has progressed despite standard therapies, a Phase 1 clinical trial offers some hope to families who have no other treatment options.

"This is the first vital step on the long road of clinical trials to find effective treatments for cancer," says Dr. Bagatell. Drug studies go through three phases of testing before they are approved by the Food and Drug Administration and it is usually many years before a new anticancer drug reaches the market. "The drug must pass this critical first phase before going on to Phase 2," she says.

"What's great about Anne is that she understands the research process. In a lab, everything costs money and these funds enable our research to move forward by allowing us to collect, process and analyze samples from nine other sites so that we can better understand how these drugs work on the molecular level," explains Dr. Bagatell. "We are so grateful to RARK and the invaluable support they have given us over the past few years."

For Anne Fritz, it's about curing pediatric cancer. "I passionately believe that we won't find cures for childhood diseases unless we're doing research. Medical research is vitally important for the future of children's health."

To learn more about Raise A Racquet for Kids, please visit www.rark.org.

PANDA



Under the leadership of Penny Gunning and Robyn DeBell, the Phoenix Women's Board of the Steele Children's Research Center was established in 1999. Today, over 35 influential women dedicated to children's health comprise the board, which has a mission to support discovery processes that lead to improved treatments and cures for devastating childhood diseases. To capture the essence of its mission, the board adopted the name PANDA—People Acting Now Discover Answers. As mothers and grandmothers, these women not only know the importance of creating a healthier future for children but are willing to work hard to help create it.

The PANDA signature fund-raising event is a children's fashion show held each spring in conjunction with Nordstrom. Dubbed the "Children Helping Children" Fashion Show, it gives young people the opportunity to develop their philanthropic sensibilities by participating as models in the show. PANDA has funded a range of research activities at the Steele Center, from purchasing state-of-the-art equipment to supporting young investigators known as PANDA Scholars, to underwriting specific research projects.

The 2004 PANDA Fashion Show raised \$150,000 for Steele Center investigators to explore the genetic causes of Crohn's disease in collaboration with researchers at TGen (the Translational Genomics Research Institute).

The Sixth Annual "Children Helping Children" Fashion Show Luncheon will be held on Saturday, April 23, 2005, at the Arizona Biltmore Resort and Spa. This year's event has a theme of "Children Grow with Research" and proceeds will fund pediatric cancer clinical research. Tickets are \$100 and are available by calling (602) 631-4619.

Mommy, My Tummy Hurts!

Looking for the Genes of Crohn's Disease

It's normal for children to get tummy aches once in a while, but for many, the tummy aches don't go away. These children experience persistent abdominal pain, diarrhea, fatigue, and weight loss. These painful symptoms may indicate a serious gastrointestinal condition: Inflammatory Bowel Disease (IBD).

IBD is a chronic inflammation in the intestinal tract. The two most common forms of IBD are Crohn's disease and ulcerative colitis, and affect as many as 1 million Americans. IBD can occur at any age, but most often is diagnosed in children and young adults between the ages of 10 and 19. And every year, about 30,000 individuals are diagnosed with IBD.

What causes IBD? It is not completely known, but research has shown that both genetic and environmental factors contribute to Crohn's disease and ulcerative colitis.

In 2004, the Phoenix Women's Board of the Steele Children's Research Center designated its gift to help answer the question about the causes of IBD. Members of the Women's Board have affectionately adopted the name PANDA, an acronym that stands for People Acting Now Discover Answers.

With the support of PANDA, Faye K. Ghishan, MD, Professor and Department Head of Pediatrics, and Pawel Kiela, PhD, Research Assistant Professor, are looking for genetic factors associated with Crohn's disease. "The goal of our research is to identify additional genes associated with Crohn's disease. Finding those genes is crucial to developing new targeted therapies," says Dr. Ghishan. The women of PANDA are wagering that Drs. Ghishan and Kiela can discover some answers to the puzzling questions surrounding Crohn's disease and ulcerative colitis.



"We know that Crohn's disease is a multigenic disease, meaning it involves many genes," says Dr. Kiela. "And previous research has identified one gene that shows a connection to Crohn's disease—NOD2. But only about 20 percent of all Crohn's diagnoses has the NOD2 mutation."

Environment is equally important to the development of Crohn's disease. "We know that environmental factors trigger genetic responses that lead to Crohn's. In general, Asians have a low occurrence

Drs. Pawel Kiela and Faye K. Ghishan.

of Crohn's disease. "However, when they move to North America or Europe, incidence of the disease increases," says Dr. Kiela. "There is interplay between one's genetic predisposition to the disease and the environment. You have to have both the genetic predisposition for Crohn's disease and the triggering environmental factors in order to get the disease."

By collaborating with TGen (the Translational Genomics Research Institute in Phoenix) and Phoenix Children's Hospital, blood samples are collected from families where at least two members suffer from Crohn's disease. TGen will utilize the newest technology in genetic research to analyze the samples: microarray SNP analysis—a highly effective technique for genetic analysis. "SNP analysis takes less time, has a better resolution than traditional approaches and the findings will be more precise," says Dr. Kiela.

"The goal of our research is to identify additional genes associated with Crohn's disease. Finding those genes is crucial to developing new targeted therapies."

So far, Drs. Ghishan and Kiela have collected blood samples from seven families. "Our target is to obtain samples from 20 families. As we add more families, the statistical strength of the analysis will increase and we may be able to identify new genes involved in the pathophysiology of Crohn's disease," says Dr. Ghishan. At Phoenix Children's Hospital, Mitchell Shub, MD, Chief of Pediatric Gastroenterology, is gathering additional samples from families for analysis.

"Interestingly, none of our patients tested have known mutations in the NOD2 gene," explains Dr. Kiela. "This is good news because this increases our chances of discovering novel genes." Drs. Ghishan and Kiela are waiting for the first batch of results from TGen. "Using the latest research to discover the genes that may play a part in Crohn's disease is very exciting," says Dr. Kiela.

"Thanks to PANDA, we are able to move forward in our quest to discovering the genetic causes of Crohn's disease. Through our discoveries, we hope to create better therapies that ultimately will help children and families suffering from this disease," says Dr. Ghishan.

Kristina Dawson: A Heart of Compassion, Courage and Generosity



Every once in a while the Steele Children's Research Center receives a gift that has special meaning.

At the young age of 11, Kristina Dawson was diagnosed with a pontine glioma (a brain stem tumor). "What was amazing about Kristina," says her father Mike Dawson, "was that Kristina did not let the tumor destroy her spirit. In fact, it amplified her positive traits."

Among her many positive traits was a heart of compassion, courage and generosity. "She loved people and always wanted to help others," said Mr. Dawson. For Kristina, one way of helping others translated into a fundraiser for cancer research. After looking at many charities, she decided to raise support for research being conducted by her doctor, Steele Center pediatric oncologist Rochelle Bagatell, MD.

Kristina loved the history of the American Revolution. "She was a history buff and a little patriot," says Kristina's mom, Mary. So when Kristina decided to raise funds for Dr. Bagatell's research, it was natural that everything would have a patriotic theme. "Kristina was very creative," says Mr. Dawson. "She came up with the idea of making friendship bracelets, greeting cards, handmade soap, glass bead key chains, flag pins, candle holders and glass ornaments. Everything was red, white and blue. Kristina coordinated all the work, and we held the fundraiser last August," says Mrs. Dawson. In September, Kristina presented a check to Dr. Bagatell for her cancer research. "Krissy came up to the lab to see what kind of work we were doing there. After a tour of the place, she handed me some sample bracelets, a keychain and a check. To this day, when I pull out my keys, I think of Krissy and her quiet determination to do something to improve cancer treatment for other kids," says Dr. Bagatell.

After a courageous battle with cancer, Kristina passed away on November 28, 2004. "Kristina inspired us by her incredible compassion. Every day, she reached out to others, wanting to make sure they were okay. She kept us in awe," says Mr. Dawson.

The example of Kristina Dawson's life is a priceless gift to the Steele Children's Research Center. Her indomitable spirit, her positive attitude and her ability to find joy every day reminds us that she and all children with perplexing illnesses are why we are here.



Kristina presents her fundraising proceeds to Dr. Bagatell.

A New Look at an Ancient Therapy:

Acupuncture in the Treatment of Cerebral Palsy

Cerebral palsy (CP) is the most frequent cause of childhood disability in the United States, affecting approximately four of every 1,000 children born each year. CP is caused by an injury to the brain during its most rapid stage of development, resulting in motor dysfunction. Some of the symptoms of cerebral palsy include difficulty with walking and maintaining balance, difficulty with fine motor tasks (such as writing), speech impairment, and involuntary movements. The extent of the disabilities depends on the severity of the injury and varies from one child to the next.

The standard of care for CP in the United States includes the use of physical therapy, occupational therapy, speech therapy, and when necessary, braces and orthopedic surgical interventions.

In China, cerebral palsy is treated quite differently. The traditional therapies used in the U.S. are combined with the traditional Chinese medical therapies of deep massage and acupuncture. Acupuncture is the insertion of fine needles into the body along specific points called “meridians.” It is believed to restore physiological functioning of the body and has been a mainstay of traditional Chinese medicine for more than 5,000 years.

Children in China begin treatments much younger than children in the United States. Chinese CP therapies typically are delivered with an intensity that therapists would like to employ here, but managed care and the high cost for personnel prohibit it.

“Many articles in Chinese medical journals report a significant decrease in the disabilities seen in children with CP using this combination of ‘Western’ and Chinese therapies,” says Burris “Duke” Duncan, MD, Professor of Pediatrics and Preventive Medicine. “However, claims made by the Chinese have not met the test of vigorous scientific scrutiny.”

An open mind and being a witness to other methods used in other cultures prompted Dr. Duncan to apply for



funds to scientifically test the effectiveness of the approach advocated by Chinese physicians.

Dr. Duncan received a three-year \$512,000 research grant from the Arizona Disease Control Research Commission that will enable him and his team to investigate the effectiveness of acupuncture when used in conjunction with conventional physical, occupational and hydro-therapies used to treat children with spastic cerebral palsy—the most common form of CP. “Our quest is to explore the possibility that the Chinese package of care for children with cerebral palsy will improve the motor function and hence the lives of children affected by this condition,” he explains.

The study, titled “Acupuncture as Complementary Therapy for Cerebral Palsy,” is an international collaboration between Beijing Children’s Hospital (BCH), and the Department of Pediatrics at The University of Arizona. All of the treatments will be done at BCH while all of the evaluations will be done by physical therapists at UA, who will score the outcome measurements that have been taped in China using a digital video camera.

After obtaining parental consent, Chinese children with spastic cerebral palsy between 12 months and 6 years of age will be enrolled in the random controlled trial. “We anticipate enrollment of 100 children, half of whom will be randomized to Group 1 and half to Group 2,” says Dr. Duncan.

Children in Group 1 will receive the Chinese package of care consisting of physical, occupational and hydro-therapy plus acupuncture and deep massage. Children assigned to Group 2 will receive the more accepted “Western” package of care consisting of physical, occupational, and hydro-therapy without acupuncture.

Each group will receive its respective “package of care” every day, five days a week for 12 weeks. Following a wait period of 12 weeks, the children in Group 2 will complete the Chinese standard of care and will receive acupuncture and deep massage. Each child will be evaluated six times using standard outcome measurement tools. The evaluations will be recorded onto DVDs and scored at the UA by qualified physical therapists who are “blinded” to which group the child is in

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Health

and when the evaluation was conducted in relationship to the time in the treatment sequence.

“We will monitor the study from the UA on a daily basis through a password-protected website and will use the internet, free of charge, for weekly video-audio conference calls between Beijing, Tucson, and Israel—where one of our collaborators is now living,” explains Dr. Duncan. “New available technologies have made this challenging study feasible. If the Chinese standard of care is found to be superior to the currently accepted standard practiced in the U.S., we’ll be laying the groundwork for future research, which could impact clinical practice and health care policy as related to therapy for children with cerebral palsy. It’s exciting work!”



From left: Drs. Hua Zheng, Duke Duncan, Tongli Han and Yun Wu.

Angel Wing Diabetes Educator and Girl Scouts Create Innovative Program to Teach Youth about Diabetes Prevention

Type 2 diabetes—also known as “adult onset diabetes”—is soaring among children and adolescents. Jeanne Fenn, RN, CDE, a Certified Diabetes Educator with the Angel Wing for



Children with Diabetes at the Steele Center, wants to do something about it. As a diabetes

educator, Ms. Fenn teaches children and young adults how to prevent and manage type 2 diabetes. She also is involved in the Girl Scouts with her daughter, Josie. Choosing “Diabetes Education and Prevention in Youth” as the theme for their community service project, Ms. Fenn and her Girl Scouts troop created a wonderful diabetes educational program that is both entertaining and educational. Their program includes a play, “The Evil Diana Betes vs. Sir Insulin Monk,” that informs and entertains elementary and middle-school-aged children about the risks of diabetes. “The kids love it. The play engages the audience, while providing solid information,” says Ms. Fenn. “What’s more, our educational materials have been translated into Spanish and Tohono O’odham.”

The program includes a custom-designed carrying case, training DVD, training materials, script and other teaching tools. “Ultimately we want schools to incorporate this into their curriculum, and would love it if the American Diabetes Association would distribute our program nationally,” says Ms. Fenn.

If you would like more information, contact Jeanne Fenn at: jfenn@umcaz.edu.



A GENEROUS OPTIMIST:

Carol Williams

Carol Williams has been a member of the Pueblo Optimist Club since 1988 and she certainly lives by the Optimist creed, looking to bring happiness to those around her.

A retired community college teacher, Carol has volunteered as a "cuddler" in the Neonatal Intensive Care Unit (NICU) at UMC for eight years and frequently brings her Sheltie, Sabrina, to the ChildLife Center as a volunteer pet visitor. She gives financially as well, with frequent donations in memory of her late husband, Keith. With his natural white beard and ample tummy, Keith had a 20-year monopoly on playing Santa Claus at the Optimist Christmas Party each year in the ChildLife Center.

After Keith passed away in 1992, Carol felt that gifts in his memory should benefit the sick children to whom he had given so much of his time. Her faithful and consistent memorial gifts over the past 13 years have now reached \$10,000. She will be honored by having her name inscribed on the Steele Center's Benefactor Wall.

Chief Resident Chosen to Present Case Study Poster at American Academy of Pediatrics Conference

Pediatric chief resident Rob Niebler, MD, thrives on the constant action in the PICU—the Pediatric Intensive Care Unit. "All the interesting cases end up in the PICU," explains Dr. Niebler. "There is always something new to learn from the PICU patients."

Dr. Niebler was one of only 10 residents nationwide chosen to present a case study poster at the 2004 National American Academy of Pediatrics conference in October. Residents were asked to submit an abstract on "an interesting patient case," and Dr. Niebler knew he had a case that was both interesting and relevant to present to the pediatric community.

Dr. Niebler's poster presentation, "Hyperglycemic Hyperosmolar Syndrome in a 19 year-old Down Syndrome Patient," was based on a patient case he encountered while on rotation in the Pediatric Intensive Care Unit (PICU).

Hyperglycemic Hyperosmolar Syndrome (HHS) is a complication of diabetes. It results when an individual's blood sugar rises to the point where the body

"I love hospital medicine.

The PICU is where all the action is."

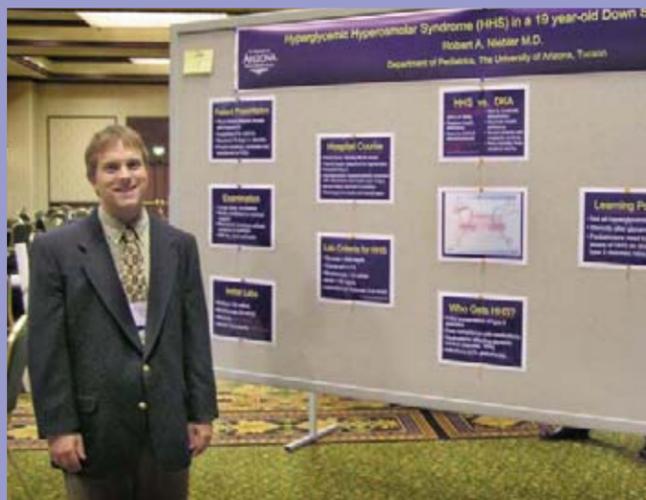
no longer can control it. A person becomes extremely dehydrated. Dehydration, coupled

with high blood sugar may progress to drowsiness, and in extreme cases, coma.

HHS is usually only found in adults. What makes Dr. Niebler's case study so interesting is that it revealed HHS can occur in childhood. And with childhood obesity increasing—and type 2 diabetes as a consequence—this growing epidemic may make HHS a common pediatric diagnosis.

"This is a great opportunity for Dr. Niebler," says Leslie Barton, MD, head of the pediatric residency program at The University of Arizona. "This poster reflects his keen, probing mind and his excellence—which have been manifest, not only throughout his three years of residency but also through the work he has accomplished as one of the chief residents this year."

After Dr. Niebler completes his residency, he will be moving to Milwaukee to complete a pediatric critical care fellowship at Children's Hospital of Wisconsin. "I love hospital medicine. The PICU is where all the action is."



Resident Awarded AAP Grant: Predicting a Child's Response to Chemotherapy

Wouldn't it be great if doctors could predict if a child with cancer would respond to chemotherapy treatments before he or she is treated? If there were a test to determine whether a child would respond to chemotherapy, many children could be spared from chemotherapy and its negative side effects.

This is what Jean Mulcahy, MD, second-year pediatric resident, will be exploring through a research grant recently awarded to her by the American Academy of Pediatrics (AAP).

Residents typically spend their three-year tenure as physicians-in-training primarily in clinical settings, completing a rotation every month in the various areas of pediatrics: the neonatal intensive care unit (NICU), the hospital wards, outpatient clinics, adolescent medicine and behavioral medicine to name just a few.

So it's a bit unusual for a busy resident to pursue a lab-based research project during her residency. But that's just what Dr. Mulcahy did. Since the residency program at the UA is housed within an academic medical center, where the link between research and patient care is emphasized, Dr. Mulcahy's research interests could be supported.

In August, Dr. Mulcahy was awarded a grant from the AAP for a research project titled, "Neuroblastoma Cell Line Sensitivity to a Novel Heat Shock Protein 90 Inhibitor." She competed against approximately 60 other applicants nationwide and was one of only 10 residents awarded a grant. "This is a remarkable accomplishment for a resident," says Leslie Barton, MD, head of the pediatric residency program at The University of Arizona.

Dr. Mulcahy has wanted to study hematology/oncology since college. "Learning about disease is interesting and challenging. The purpose of this AAP grant is to get residents involved in research. This gives me the chance to re-energize my love of research."

Much of the current research in the field of pediatric

anticancer drug development is focused on developing drugs that will increase survival rates while at the same time decrease harmful side effects. The new anticancer drugs seek out and destroy the cancer cells, while leaving the healthy cells unharmed. The goal is to make chemotherapy less toxic and produce fewer negative side effects. Even so, Dr. Mulcahy explains, "if we can determine beforehand whether chemotherapy will be effective, we can save children from unnecessary pain."

Dr. Mulcahy's research will evaluate the sensitivity of a panel of neuroblastoma tumor cell lines to geldanamycin—a new cancer drug—that has been shown to inhibit the function of Heat Shock Protein 90 (hsp90), a protein that plays an important role in the development of cancer. Dr. Mulcahy hopes to show through her research that neuroblastoma cell line sensitivity to geldanamycin correlates with changes in levels of specific proteins that are known to play key roles in childhood tumors. If levels of these proteins change in a reproducible way when cells are exposed to the Hsp90 inhibitor, pediatricians may have a better way to predict which children would respond well to drug treatment.

However, if it's determined that a child most likely would not respond to the anticancer drug, other treatment methods could be recommended. Ultimately, "we'll be able to target the most effective drug to the patient," says Dr. Mulcahy.

Pediatric oncologists Rochelle Bagatell, MD, and Luke Whitesell, MD, will mentor Dr. Mulcahy throughout her research. "This research will help Dr. Mulcahy understand the broader picture of what research means," explains Dr. Bagatell. She will monitor Dr. Mulcahy's progress, providing guidance when needed. "Dr. Mulcahy is one of the most outstanding residents we have seen in recent years. This project will enable her to master the technical

"If we can determine beforehand whether chemotherapy will be effective, we can save children from unnecessary pain."

skills required to complete this project, and deepen her ability to think about cancer biology," says Dr. Bagatell.

In addition to the opportunity to conduct research, the AAP award includes a travel stipend to the 2005 Annual AAP conference in Washington D.C., where Dr. Mulcahy will present her findings. This experience will enable Dr. Mulcahy to discuss her research with pediatric investigators from across the country. "It's a great chance to network with others and learn about the latest research going on in the field," she says.

What's next for this aspiring researcher/physician? After completing her residency, Dr. Mulcahy will complete a fellowship in pediatric hematology/oncology where she will continue to cultivate her skills as a physician and researcher. "There are many research opportunities in pediatric oncology, and my goal is to end up at a teaching hospital within an academic institution where I can be both clinician and researcher."

UA Pediatricians Awarded for Excellence in Teaching

What makes a great teacher?

Great teachers seem to have an innate ability to inspire students to excel beyond their own expectations. Great teachers are passionate about learning and desire to empower others. Great teachers find joy in teaching and are rewarded by helping others learn. Great teachers are dedicated to making information accessible to all, while challenging students to think for themselves. And great teachers have fun teaching.

The Department of Pediatrics has many great teachers. Recently, a few of our faculty—Drs. Ziad Shehab, Wayne Morgan, Bill Madden, Sean Elliott, Karen Davenport and Conrad Clemens—were awarded for their excellence in teaching medical students and residents. We're proud of their accomplishments and their commitment to training our future pediatric physician/researchers.

Teaching is fun:

Dr. Ziad Shehab

Ziad Shehab, MD, Professor of Clinical Pediatrics, is the recipient of the 2004 Clinical



Dr. Shehab and first-year infectious disease fellow Sam Mourani, MD.

Science Educator of the Year award. Dr. Shehab has received numerous teaching awards over the years, including the Dean's List for Excellence in Teaching in the Clinical Sciences and the Vernon and Virginia Furrow Award. This is the third time he has been honored with the Clinical Science Educator of the Year award. "This award is especially meaningful to me because it was voted on by the students," says Dr. Shehab.

After 21 years with the Department of Pediatrics, Dr. Shehab still loves teaching. "This is why I'm here," he says. One reason he enjoys teaching so much

is the interaction with students. "I learn so much from these bright people. There is much to learn from teaching, and you learn very quickly that there is a lot you don't know."

Dr. Shehab sees teaching as more than imparting facts. He tries to engage his students to think about the scientific process and learn how to problem solve. "I want them to learn how to ask the right questions so they can go back to the literature and find out what the answers are," he explains. "It's very interesting to watch how different students approach and solve problems."

Most of all, teaching is fun for Dr. Shehab. "I teach because I have fun doing it. It's fun to challenge the students, listen to them defend their ideas, and watch them as they learn and grow."



Dr. Shehab with second-year resident Francesca Estrada, MD.



Dr. Conrad Clemens



Dr. Karen Davenport



Dr. Sean Elliott



Dr. Bill Madden



Dr. Wayne Morgan



Dr. Ziad Shehab

Teaching is a joy:

Dr. Wayne Morgan

"Teaching is a joy," says Wayne Morgan, MD, Professor of Pediatrics. "No matter how impossibly busy I am, I can't give it up; teaching is too much fun."

Dr. Morgan received the 2004 Vernon and Virginia Furrow Award for Excellence in Basic Science Teaching for Medical Students. For 17 years he has enjoyed teaching first-year medical students the basic science course Respiratory Physiology. Dr. Morgan is the only professor to be awarded a combined Furrow Award for Excellence in Basic Science and Clinical Science Teaching for Medical Students 15 years ago.

Dr. Morgan thrives on bringing the "real world" to first-year medical students. "Whether it's in formal clinical examples, or showing a physiologic concept on a slide and



Dr. Morgan with ASU Nurse Practitioner student Melissa Young.

saying, 'I just saw a child last week who had exactly this problem, and understanding that physiology helped us get him better,' I think, makes it real for the students."

Additional sources of joy for Dr. Morgan include helping patients and their families, and conducting research. "But equal to both of those joys is getting across a concept and watching young physicians-in-training 'get it,' understand it and realize why it matters," he explains. "Another reason why teaching is joyful is that the beauty of how the body works and the way the lungs evolve is truly elegant and a wonder in itself. So teaching enables me to rediscover the complexity, elegance and beauty of the respiratory system every year that I teach it."

Dr. Morgan recently published an article in *The New England Journal of Medicine* that has received national recognition. He is regarded nationally as an expert in pediatric pulmonology. And yet, he receives questions from students every year that still challenge and stimulate his thinking. "In this way, the students are constantly teaching me as we explore the answers together."

Teaching is helping others learn:

Dr. Bill Madden

Bill Madden, MD, Associate Professor of Clinical Pediatrics, has been teaching since 1977 and still loves it. "As the years go by, the teaching that I do becomes more and more important to me," he says.

Dr. Madden received the Vernon and Virginia Furrow Award for Excellence in the Clinical Science Teaching for Medical Students. He has won many teaching awards in the past, and this award symbolizes his love of teaching. "Over the years, clinical care has become the means to what it is I'm supposed to be doing. And that's teaching,"



Dr. Madden and third-year resident Angela Zarate, MD.

he explains. He enjoys clinical care—helping patients and their families—but what he finds truly rewarding is "helping others become educated in the wonderful world of pediatric medicine."

"I'm here to help the medical students and residents learn. My job is to provide an environment where the patients can teach them. I support that process by asking questions to get medical students and residents to think about medical problems differently."



Dr. Madden and second-year resident Mike Seckeler, MD.



Dr. Sean Elliott with second-year resident Sabrina Shib, MD, third-year emergency medicine resident Steve Beckwith, MD, and fellow Sam Mouraini, MD.

Dedicated to making medical education accessible:

Dr. Sean Elliott

Sean Elliott, MD, Assistant Professor of Clinical Pediatrics, recently was named to The University of Arizona College of Medicine Dean's List for Excellence in Teaching in the Clinical Sciences. A natural educator, he has won many teaching awards over the years, including the Longitudinal Clinical Curriculum Preceptor of the Year in 2003. "I love the active involvement of teaching," says Dr. Elliott. "Being involved with students and getting them involved in learning is very rewarding."

In 2000, Dr. Elliott was accepted into the Dean's Teaching Scholar Program. This program is hosted by the UA College of Education and includes faculty from the Colleges of Medicine, Nursing and Pharmacy. Program members meet once a month to discuss and explore different instructional methods to improve their teaching techniques.

As a result, Dr. Elliott conducted a research project exploring "Morning Report (MR)" and how effective it is as a teaching tool. Morning Report meetings give residents the opportunity to foster their presentation and analytical skills while formally examining a patient case. Faculty attend to provide guidance to the residents. Based on his research, Dr. Elliott was able to recommend strategies to increase the satisfaction and efficiency of MR for residents and faculty.

"I see myself as both clinician and educator. Through teaching, I confirm my own knowledge and am constantly learning. By participating in creating medical knowledge, I feel we have a duty to teach in such a way that people can understand, and I'm committed to making medical information accessible to all our students."

Dr. Elliott believes that excellence in teaching can be a form of public relations, too. "If we're able to get a name for being good teachers, then hopefully that makes the University and the College of Medicine that much more significant and appealing to future students and residents."

Teaching is about empowering others:

Dr. Karen Davenport

After working in Alaska, Idaho, Utah, Arizona, Texas and St. Lucia, Karen Davenport, MD, Assistant Professor of Clinical Pediatrics, returned to the UA Department of Pediatrics in 2002 to be involved with medical students and residents.

"I returned to the university setting because I wanted to teach. I wanted to be around young people who are enthusiastic about learning to be good doctors," says Dr. Davenport. "It is a great experience to see the 'light bulb' turn on in a student's eyes, or show a student who isn't necessarily interested in pediatrics how much fun it is caring for children."

Dr. Davenport was awarded the Vernon and Virginia Furrow Award for Excellence in the Clinical Science Teaching for Medical Students. "It was a great honor to



Dr. Davenport and second-year resident Angela Fimbres, MD.

receive this award," she says. Dr. Davenport's commitment to, and passion for, teaching medical students and residents is evident. "I strive to empower medical students and show them how basic sciences can be applied directly to patient care. Learning how to be a good doctor isn't just about treating the symptoms—it's about caring for the whole person. The art of medicine begins with learning how to communicate effectively with your patients and their parents."

One of the best things about teaching, Dr. Davenport explains, is that "it keeps you fresh with current medical theories and treatments. Additionally, I find that by teaching residents and students, I learn from them as well."



Dr. Davenport and second-year resident Josh Timock, MD.

Educating parents is also important to Dr. Davenport. "Sometimes it's done by explaining to the parents the importance of reading to their children, other times it's teaching that certain behaviors are normal. Many times, it's simply praising the parents for a job well done. Our job as pediatricians is not only to diagnose, but it's about being a cheerleader and empowering parents, because they are their children's most important teachers."

A passion for teaching:

Dr. Conrad Clemens

"Teaching is invigorating," says Conrad Clemens, MD, Associate Professor of Clinical Pediatrics and Medical Director at University Physicians Children's Center at Kino. "In fact, it's why I came to The University of Arizona."

Dr. Clemens was awarded the Vernon and Virginia Furrow Award for Excellence in Graduate Medical Education Teaching. "This award means a lot to me. It



Dr. Clemens and first-year resident Ryann Bierer, MD.

means more to me than a publication, because this is what I love to do. For your passion to be recognized as excellent is incredibly rewarding," says Dr. Clemens.

Learning from the residents and medical students is

one of the most rewarding aspects of teaching, says Dr. Clemens. "They do not allow you to become complacent, and almost always bring enthusiasm and interest and fun with them," he explains.



Dr. Clemens and third-year resident Jim Smith, MD.

The relationship he builds with the students and residents is important, too. "Every resident and medical student is different; all have wonderful strengths. I enjoy the relationships I develop with them. To me, teaching is a horizontal relationship where we can learn from each other."

Dr. Clemens sees his role as a facilitator. "I try to make sure the environment is conducive for learning. I feel it's very important that medical students learn how to search for knowledge themselves, whether it's from a textbook, a journal or from the Internet. I don't give them the answers; I help them learn how to find the answers for themselves. In this way I facilitate the discipline of lifelong learning."

"I teach because I have fun doing it. It's fun to challenge the students, listen to them defend their ideas, and watch them as they learn and grow."

— Dr. Ziad Shehab
Clinical Science Educator of the Year, 2004

An Invaluable Experience: Residents Make a Difference at St. Andrews Clinic



Second-year resident Ryann Bierer, MD, with patients at St. Andrews.

It's easy to take our health care system for granted. Get sick, drive 20 minutes to the doctor's office, wait 30 minutes to see your physician, get a prescription, get it filled and go home.

Imagine living in a village in Southern Mexico, waking up at 2 a.m. to board a jam-packed bus with your son who suffers from cerebral palsy. You and your son travel 12 grueling hours north through narrow winding dirt roads and crowded traffic, just to get to "la clinica." Welcome to St. Andrews Clinic, a church in Nogales, Arizona, that converts to a health care facility once a month to serve Mexican children needing medical care—free of charge.

Here, pediatricians, orthopedic doctors, pediatric residents, speech and occupational therapists, medical students and other health care workers provide much-needed health services to impoverished Mexican adults and children. All are examined; none are turned away.

As part of the UA Department of Pediatrics Residency Program, residents travel to St. Andrews once a month to give medical treatment to children in need. "We see a lot of kids with diseases that have progressed because they haven't gotten care earlier. So it gives residents the opportunity to see the whole range of disease," says Lynn Jacoby, MD, chief resident. "Plus, it's a good lesson in why we perform and order labs. We have to think more about why a certain lab test needs to be done. We have to think about the costs of the tests and if the test is really necessary," she explains.

For many residents working at St. Andrews, this unique experience may be as close as they get to "Third-World medicine"—where resources are limited and the needs are great. "We'll examine between 40 and 80 children in one day," says Dr. Jacoby. "Residents become involved in all aspects of medicine: they are the front desk, they're the pharmacy, the insurance company,

the cost containment of labs and X-rays," she says.

First-year resident Ryann Bierer, MD, didn't know what to expect on her first trip to St. Andrews. Her experience was unforgettable.

"It gives you a completely different perspective of health care, and what people need. It's so much more fundamental at this level," says Dr. Bierer. "I feel like we actually make a difference. These people are in a very difficult social situation. We know we can't solve their social problems, and that was an important realization for me. But we can help with their physical problems, and that is very satisfying."

"La clinica" gives residents the chance to practice medicine for underserved populations who don't have access to comprehensive health care services like those readily available in the U.S. St. Andrews is crammed with people who wait hours to be examined. Long folding tables serve as exam tables. Exams are conducted in the church hallway, so there is virtually no privacy. And there are so many patients, it's almost a miracle that all of them can be seen the same day. "Sometimes, it is fairly organized mass chaos," admits Dr. Jacoby. But this chaos



Chief residents Rob Niebler, MD, and Lynn Jacoby, MD, at St. Andrews Clinic.

can be instructive. "You'll see amazing things here—interesting findings and cases. It's not comfortable and not what residents are used to. It can be really frustrating. But it's invaluable."

Dr. Bierer is grateful for her St. Andrews experience. "One thing I liked most about this experience was that I got the sense that all the volunteers were there for the kids. The sub-specialists, the interpreters and other volunteers who give up one day a month to help children is very inspiring."



GIVING THANKS

We appreciate every gift made to the Steele Children's Research Center to improve children's health. We want to give special thanks to the following donors who gave \$1,000 or more from October 2003 to the end of December 2004.

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2004 Faculty Highlights

Cardiology

Scott E. Klewer, MD, Associate Professor of Pediatrics received a \$1.3 million award from the NIH for his work on integrins in heart valve development. He is also principal investigator for studies investigating the role of hyaluronan in heart valve development, which is part of Dr. Ray Runyan's \$6 million NIH Program Project Grant on heart development. Dr. Klewer was named Associate Director for Program Development for the Steele Children's Research Center and was elected President of the Board for the American Heart Association's Southern Arizona Division.

Ricardo Samson, MD, Associate Professor of Pediatrics co-authored the two international guideline statements on pediatric automated external defibrillators published in *Circulation*, *Pediatrics* and *Resuscitation*.

Critical Care

Robert A. Berg, MD, Professor of Pediatrics completed the first and only randomized-controlled trial of any intervention for pediatric cardiac arrest. The results of this landmark study, "A comparison of high-dose and standard-dose epinephrine in children with cardiac arrest," were published in the *New England Journal of Medicine* in April 2004. Dr. Berg also co-authored the two international guideline statements on pediatric automated external defibrillators and on drowning reporting, both published in *Circulation* and *Pediatrics*.

Marc Berg, MD, Assistant Professor of Clinical Pediatrics, was awarded the Off Service Attending Award for "Dedication and Excellence in Teaching" by the Arizona Health Sciences Center Emergency Medicine Graduating Class of 2004.

Juan Gutierrez, MD, Assistant Professor of Clinical Pediatrics was appointed Medical Director of the UMC Pediatric ICU (PICU).

Robyn Meyer, MD, Assistant Professor of Clinical Pediatrics was appointed Medical Director of the UMC Pediatric ECMO program.

Andreas Theodorou, MD, was promoted to Professor of Clinical Pediatrics. Dr. Theodorou was appointed Associate Head of Clinical Affairs for the Department of Pediatrics. Dr. Theodorou was also appointed Co-director of the UMC Center for Quality and Safety.

Endocrinology

Mark Wheeler, MD, Associate Professor of Clinical Pediatrics was named as a "Top Pediatrician" in the *Guide to America's Top Pediatricians 2004-2005*. Dr. Wheeler is a board member of the Juvenile Diabetes Research Foundation.

Gastroenterology/Nutrition

Liqun Bai, MD, Research Assistant Professor, received a 5-year grant from the National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK) entitled, "Regulation of digestive vesicular glutamate transporter."

James Collins, PhD, Research Assistant Professor, received an R21 grant from the NIH entitled, "Intestinal Iron Transport in Iron Deficiency/Anemia."

Fayez K. Ghishan, MD, Professor and Head, Department of Pediatrics; Director, Steele Children's Research Center was the recipient of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition's highest honor, the Shwachman Award, for making major, life-long scientific contributions to the field of pediatric gastroenterology, hepatology and nutrition in North America. Dr. Ghishan is also the Associate Editor for the major textbook, *Physiology of the Gastrointestinal Tract*.

Hassan H. Hassan, MD, Associate Professor of Clinical Pediatrics was named Section Head of Pediatric Gastroenterology/Nutrition.

Pawel Kiela, PhD, Research Assistant Professor received a 5-year R01 grant from the NIH entitled, "Inflammatory Bowel Disease: A Novel Therapeutic Approach."

General Pediatrics

Burris "Duke" Duncan, MD, Professor of Pediatrics was awarded by the American Academy of Pediatrics the Arizona Achievement Award for "Exceptional Work to Increase Access to Health." He was given the Senior Section Child Advocacy Award by the American Academy of Pediatrics. He received the Humanitarian Award from the Arizona Medical Association.

Bill Madden, MD, Associate Professor of Clinical Pediatrics received the Vernon and Virginia Furrow Award for Excellence in the Clinical Science Teaching for Medical Students.

Genetics

Robert Erickson, MD, Professor of Pediatrics was an editor of *Inborn Errors of Development. The Molecular Basis of Clinical Disorders of Morphogenesis*, which won the top prize in clinical medicine from the American Publishers Professional Scholarly Publishing Division Annual Awards. Dr. Erickson was invited to the 19th International Congress of Lymphology to present, "Searching for lymphangiogenesis genes," in Freiburg, Germany.

Christopher Cunniff, MD, Professor of Pediatrics serves as Secretary of the American College of Medical Genetics. He was Chair of the Committee on Genetics of the American Academy of Pediatrics.

William Garver, PhD, Research Assistant Professor received the Ara Parseghian Medical Research Foundation Innovative Investigator Award for 2004-2006.

Hematology/Oncology

Rochelle Bagatell, MD, Assistant Professor of Pediatrics was selected as Faculty for Vail AACR/ASCO Methods in Clinical Cancer Research. Dr. Bagatell was invited to give a presentation at the American Society for Clinical Oncology (ASCO) Meeting. She presented "A Biologically Based Phase I Trial of 17-allyl-amino-geldanamycin (17-AAG) in Children with Refractory Malignancies" for the "Drugs in the Pipeline for Childhood Cancer" session.

John Hutter, MD, Professor of Pediatrics was elected to the Executive Committee, Section of Pediatric Hematology/Oncology for the American Academy of Pediatrics. Dr. Hutter is also the Director of the Hemophilia Treatment Center, which has over 25 years of continuous extramural funding.

Emmanuel Katsanis, MD, was promoted to Professor. Findings from his continuing NIH-funded research to develop new vaccines for cancer were recently published: "Cargo from tumor-expressed albumin inhibits T cell activation and responses" was published in *Cancer Research* and "Induction of bcr-abl specific immunity following vaccination with chaperone rich cell lysates derived from bcr-abl+ tumor cells" was published in *Blood*.

Infectious Disease

Sean Elliott, MD, Assistant Professor of Clinical Pediatrics, was named to the Dean's List for Excellence in Teaching in the Clinical Sciences.

Ziad Shehab, MD, Professor of Clinical Pediatrics and Section Chief, was named Clinical Science Educator of the Year. Dr. Shehab was also awarded for Outstanding Service by the Pediatric Housestaff Class of 2004.

Neonatology

Bohuslav Dvorak, PhD, Research Associate Professor received a 2-year NIH R21 grant entitled, "Development of Novel Model of Necrotizing Enterocolitis."

Shannon Jenkins, DO, Assistant Professor and PANDA Scholar, gave a presentation about Zinc deficiency at the annual meeting of the Western Society for Pediatric Research, and at the annual meeting of the Society for Pediatric Research.

Jonathan Wispé, MD, Professor of Pediatrics received a grant from the Arizona Elks to study the role of Keratinocyte Growth Factor (KGF) in Neonatal Lung Development.

Pulmonary

Wayne Morgan, MD, Professor of Pediatrics received the Vernon and Virginia Furrow Award for Excellence in Basic Science Teaching for Medical Students. Dr. Morgan had a paper published in the *New England Journal of Medicine*: "Results of a Home-Based Environmental Intervention among Urban Children with Asthma."

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Clinical Pediatrics

Donnerstein, Richard, MD
Professor

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Samson, Ricardo, MD
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Trivedi, Kalyani, MD
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Gutierrez, Juan, MD
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Karadsheh, Michael, MD
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Meyer, Robyn, MD
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Wheeler, Mark, MD
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Professor

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Professor

Garver, William, PhD
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Heidenreich, Randall, MD
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Clinical Pediatrics

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Hutter, John, MD
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Whitesell, Luke, MD
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Colvin, Misty, MD
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Herron, Sandra, MD
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Seltz, Barry, MD
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Mark, John, MD
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Meaney, John, PhD
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About the Cover:

Cover photo is Mel Zuckerman, a generous supporter of the Steele Children's Research Center, with his newest granddaughter Talia Rose. Pictured here with Talia Rose are her proud grandparents Mel and Enid Zuckerman and her parents, Amy Zuckerman-Brown and Morey Brown.

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TO TEACH, TO HEAL, TO DISCOVER



"I truly believe that the Steele Center investigators' commitment to pediatric research means a healthier future for all our children."

Dr. Faye K. Ghishan
Director, Steele Children's Research Center



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