Features

4 Thanks and Giving 2007
Thanks and Giving ensures that desperate families find help.

6 Lessons in Living
Sometimes life’s most profound lessons are taught by 12-year-olds.

10 Vitamin Deficiency
Why does bone loss occur in children who undergo certain kinds of chemotherapy?

12 Free to Change the World
Freed from cancer, Reena Shah embarks on a quest to change lives worldwide.

16 Eradicating Ewing
In the lab and in the clinic, scientists explore ways to vanquish a killer.

20 A New Mission
Paul Sobolik launches his most important mission.

21 Earning His Wings
Country music artist Darren Warren sings the praises of St. Jude.

Highlights

2 News and Achievements

Perspective

24 Kevin Sharp
Closer Than You Think

Promise
A publication of St. Jude Children’s Research Hospital  Autumn 2007

Promise is a quarterly publication of the Department of Public Relations St. Jude Children’s Research Hospital 332 N. Lauderdale St. Memphis, Tennessee 38105

St. Jude Children’s Research Hospital’s mission is to advance cures, and means of prevention, for pediatric catastrophic diseases through research and treatment. Consistent with the vision of our founder, Danny Thomas, no child is denied treatment based on race, religion or a family’s ability to pay.

Hospital Director and Chief Executive Officer
William E. Evans, PharmD

ALSAC Chief Executive Officer
John P. Moses

St. Jude/ALSAC Chief Communications Officer and Senior Vice President
Ken Fisher

Director of Public Relations
Judith W. Black

Publications Manager and Editor
Elizabeth Jane Walker

Art Director
Jessica W. Anderson

Photo Editor
Jon Parobek

Contributing Writers
Lin Balke
Summer Freeman
Ruth Ann Hendley
Janice Hill
Mike O’Kelly
Carrie L. Strehlau
Betsy Taylor

Photographers
Peter Barta
Seth Dixon
Ann-Margaret Hedges

Editorial Advisory Board
Lisa Baker
Les Brooks
Leslie Davidson
Mark Hendricks
Christine Kirk
Marc Kusinitz, PhD
Jon McCullers, MD

Ava Middleton
Joseph Optizman, PhD
Carlos Rodriguez-Galindo, MD
Carrie L. Strehlau
Penny Tramontozzi
Regina Watson
Sally Ward
Amy Wortham
Steve Zatechka, PhD

Public Information:
1-866-2STJUDE (278-5833), ext. 3306

St. Jude is an Equal Opportunity Employer. For inquiries about stories in this publication, call (901) 495-2125 or e-mail elizabeth.walker@stjude.org. Articles may be reprinted with written permission. ©2007.

On the cover: Stephan Boehme with his doctor, Carlos Rodriguez-Galindo, MD. Story on page 6; photo by Seth Dixon.
California alliance

Treatment guidelines provided at St. Jude are now accessible to children in the southwest region of the country, thanks to a new alliance between St. Jude; Rady Children’s Hospital, San Diego; and the University of California, San Diego (UCSD).

“The alliance is designed to encourage and facilitate collaborative research that is of great interest to St. Jude, while allowing patients in the San Diego area to continue to receive medical care close to their homes,” said William E. Evans, PharmD, St. Jude director and CEO.

Making it possible for children in this region to receive the same treatment provided at St. Jude means children can stay near family and friends while undergoing treatment. The initial clinical study planned for this alliance is for children with acute lymphoblastic leukemia who have relapsed.

A sound discovery

Some children undergoing chemotherapy suffer hearing loss. This is a problem that researchers at St. Jude are trying to solve by studying some of the fine points of how the ear works.

Recently, these investigators settled a 30-year scientific debate that could explain why humans and other mammals have such sensitive hearing and the ability to discriminate among frequencies. The discovery centered on rod-shaped cells called outer hair cells, which are topped by cilia-topped cells, and the cilia help to control body activities as varied as memory loss and diabetes.

How the cilia work was a mystery, said Paul Brindle, PhD, of Biochemistry. Brindle is senior author of a report on this work that appeared in the July 24, 2007, issue of Proceedings of the National Academy of Science.

Genes choosing helpers

Scientists at St. Jude discovered that a single protein called CREB uses different tools to trigger the activity of genes that help to control body activities as varied as the formation of memories and the production of glucose in the liver.

The St. Jude team showed that each gene that responds to CREB chooses which helper molecules CREB uses to activate that gene. This finding adds an important piece to the puzzle of how cells use CREB to activate different genes, said Paul Brindle, PhD, of Biochemistry. Brindle is senior author of a report on this work that appeared in the June 20, 2007, issue of The EMBO Journal. This finding is an example of how basic research conducted at St. Jude helps scientists understand how the body works at the level of molecules.

Such information is critical to understanding why certain diseases arise, and will guide researchers in their efforts to find new treatments for diseases as varied as memory loss and diabetes.

Circulation boosts chemo

St. Jude researchers have demonstrated a promising strategy for improving therapy for neuroblastoma, a pediatric solid tumor that arises from cells in the peripheral nervous system. The investigators used the drug bevacizumab to block a protein that stimulates blood vessel growth in tumors. The scientists found that the drug temporarily improves circulation in the tumor by first eliminating defective vessels. This brief improvement in circulation allows the chemotherapy drug topotecan to more effectively penetrate the tumor.

A report on this work appears in the July 2, 2007, issue of Clinical Cancer Research.

Results of the study are especially important because they will help scientists establish guidelines for the use of drugs like bevacizumab, said the report’s senior author, Andrew Davidsdott, MD, of Surgery.

Tiny tweezers twist DNA

A team of investigators at St. Jude and Delft University of Technology (The Netherlands) created a tiny model of how the anti-cancer drug topotecan works using microscopic “tweezers” that enabled them to manipulate a single molecule of DNA.

Normally, when a cell begins to divide it makes a copy of its DNA, so each newly formed daughter cell gets an identical set. During this process, the DNA gets twisted into supercoils much like the bulges in an over-wound telephone cord. The cell uses the enzyme DNA topoisomerase I to undo the coils so the DNA can be duplicated and cell division can continue. Topotecan blocks the enzyme, trapping the DNA in supercoils. This forces the cell to commit suicide.

The investigators used the microscopic tweezers—an example of nanotechnology—to twist a single molecule of DNA into supercoils. The researchers then monitored changes in the length of an individual DNA molecule caused by the action of a single topoisomerase enzyme. Finally, they studied how the binding of a single topotecan molecule to this enzyme-DNA complex disrupts DNA uncoiling. A report on this work appeared in the July 12, 2007, issue of Nature.

“This model for how topotecan works is providing insights that could help scientists develop new drugs to treat cancer,” said the report’s co-author, Mary-Ann Bjornsti, PhD, of Molecular Pharmacology.

Back from the brink

St. Jude investigators have gained new insights into a strategy cancer cells use to survive and thrive. Researchers discovered how some abnormal cells can avoid a biochemical program of self-destruction by increasing their energy level and repairing the damage.

The finding offers an explanation of how abnormal cells that have cheated death once by disabling the main suicide pathway called apoptosis can also foil a backup self-destruct program called caspase-independent cell death. The process allows the cells to survive and become cancerous.

The St. Jude study also suggests that a drug that disrupts a cancer cell’s ability to block this backup program would allow that program to kill the cell. Such a specifically targeted drug might be more effective and less toxic than standard chemotherapy. Douglas Green, PhD, Immunology chair, is senior author of a report on this work, which appeared in the June 1, 2007, issue of Cell.

Keeping it in the family

St. Jude investigators have learned more details about a process that is prevalent in cancer and can cause miscarriages or other diseases, such as Down syndrome.

Researchers used yeast cells to understand how a dividing human cell ensures that an identical set of chromosomes gets passed on to each new daughter cell. Errors in this critical part of cell division can cause one daughter cell to get extra copies of some chromosomes that should have moved into the other daughter cell, or no copies of other chromosomes. And those errors can have drastic consequences.

The St. Jude researchers tracked the activity of a small army of molecules that help maintain a specialized, tightly packaged form of DNA called heterochromatin at the part of the chromosome called the centromere. Investigators then and showed the order in which certain critical events occur in setting up and maintaining heterochromatin. A report on this work appeared in the May 25, 2007, issue of Molecular Cell. Janet Partridge, PhD, of Biochemistry is the report’s senior author.

2 Promise / Autumn 2007

Highlights
The St. Jude Thanks and Giving campaign ensures that families find help when they need it most.

BY BETSY TAYLOR

E ven though CVS/pharmacy employee Patricia Barnes spends her days surrounded by medicine, none of it offered hope when her daughter, Susan, was found to have cancer. Then St. Jude Children’s Research Hospital threw the desperate family a lifeline.

When Susan was 17, Patricia was a CVS assistant manager in a small town in Georgia. Her reason for working was to ensure that no matter what career path Susan decided to take, money would be there for her education.

But something unexpected happened. When Susan lay in bed at night, she had a catch in her lungs; drawing breath required willpower. The symptom seemed the aftermath of a particularly bad chest cold, but lingered.

“It got to the point where she was coughing blood,” remembers Patricia. “It was a total difference at St. Jude. They had all the hope in the world. It was like night and day.”

Their CVS family allowed Patricia the time off to care for Susan and sent money so the family could have a fun outing together.

At 23, Susan has been cancer free for five years now.

This holiday season, CVS employees in Patricia’s hometown will invite their checkout customers to contribute to a special fundraising campaign for St. Jude called Thanks and Giving.

“They’ll tell what they’ve learned about St. Jude—its groundbreaking research and survival rates, the fact that no child is ever turned away based on a family’s ability to pay—and then they’ll point out their personal incentive to support the hospital.”

“See the woman behind the pharmacy counter?” they’ll ask. “That’s Patricia Barnes, and she almost lost her daughter, Susan, six years ago. Because of St. Jude, Susan is alive today.”

Then they’ll ask their customers for a donation to St. Jude—whatever they can afford is more than fine. And the good people of this small Georgia town will open their pocketbooks and give, just like they did six years ago when Patricia needed them most.

“Thanks and Giving 2007

The words of St. Jude’s National Outreach Director Maria Thomas have become the theme of the fundraising campaign. “Give thanks for the healthy kids in your life, and give to those who are not,” she says. It’s a vital reminder of the most important thing in the world—a healthy child.

Many generous organizations, including CVS/pharmacy, Domino’s Pizza, Target, Williams-Sonoma Inc., Chili’s Grill & Bar, Dollar General, Ann Taylor Brands, Kay Jewelers, Saks Fifth Avenue, the NFL, Gymboree, AutoZone, Nine West Stores and Kmart, have signed on as partners for this year’s Thanks and Giving campaign.

“We are honored to be a part of the program that included some of the country’s most respected brands and corporations,” says David A. Brandon, chair and CEO of Domino’s Pizza.

Retailers offer a variety of ways to give. Consumers may add a donation at checkout or purchase specialty items to benefit St. Jude.

The campaign is notable for its personal touches. For example, Target’s Choxie Chocolates feature designs by St. Jude kids; Kay Jewelers has created a snuggly, limited-edition plush toy; and Christopher Radko glass ornaments are inspired by St. Jude patient artwork.

But what’s most exciting about the campaign are the conversations taking place in checkout lines across the nation as employees and their customers talk about St. Jude and its work.

“Our employees wholeheartedly support the program, and our customers can sense that enthusiasm,” says Terry Burman, executive chairman of Sterling Jewelers Inc., which retails under the brand names Kay Jewelers and Jared the Galleria of Jewelry.

“The campaign’s grassroots approach fits perfectly with our philosophy of serving others in all communities we touch,” says David Purdue, chair and CEO of Dollar General.

Thanks and Giving raises awareness for the hospital while it raises funds for St. Jude. Increased awareness means that more families hear about St. Jude and know where to turn when their children have cancer.

Visit www.stjude.org for a complete list of Thanks and Giving fundraising partners. You may also donate to St. Jude online at www.stjude.org or by phone at 1-800-4STJUDE. •

This holiday season, St. Jude asks you to shop with retailers who display the green magnifying glass icon. Specialty items offered by participating retailers in the Thanks and Giving campaign include (clockwise, from left): St. Jude custom golf balls from Chezte; Christopher Radko glass ornaments.

Companies That Care

Visit www.stjude.org for a complete list of sponsors for the Thanks and Giving fundraising campaign.
Lessons in Living

Twelve-year-old Stephan Boehme inspires others through his illness.

By Mike O’Kelly

It’s a hot, midsummer day—one most 12-year-old boys spend on a baseball diamond or swimming with friends. Instead, Stephan Boehme sits in the Solid Tumor Clinic at St. Jude Children’s Research Hospital with his mother, Patty Gutiérrez. He could be complaining, but he’s preoccupied with TV shows, frogs and bears.

“Did you watch CSI last night?” he asks a St. Jude staff member, in reference to the series set in Florida, his home state. Unsatisfied with the “no” answer he receives, Stephan explains the show’s plot before quickly moving to another subject. As he talks, he hangs onto his stuffed bear Rocky, who accompanies him everywhere. Adorned with a bracelet that bears the phrase “Go Steph Go,” Rocky is as soft and cuddly as the day he was purchased nine years ago.

Stephan expresses concern over a few faded patches on Rocky’s paws, but his mother reassures him the bear is fine.

“That’s the way Stephan is,” Patty says. “He worries about everybody.”

First signs

On the evening of January 5, 2007, it was time to worry about Stephan. He suddenly felt pains in his abdomen during a trip to the movies with his mother, his fraternal twin brother, Christian, and his younger sister, Ivanna.

“I was feeling really weird, but I didn’t want to say anything because I wanted to watch the movie,” he says. It didn’t take long for Patty to notice her son sweating as he limped down the stairs of the theater. She immediately took Stephan to a local hospital.

Hours later, doctors found a mass in Stephan’s stomach and checked him into the hospital for more tests. After five or six days, doctors still could not identify the tumor. Patty phoned her oldest brother, Juan José Gutiérrez. “I understood that his only opportunity to live was if he flew to Memphis and put his life in the St. Jude doctors’ hands,” says Juan José, who helped Stephan obtain a physician’s referral to St. Jude.

Within 24 hours of his arrival at St. Jude, Stephan was found to have desmoplastic small round cell tumor, a rare, aggressive cancer with a low survival rate.

Charitable family

Stephan’s uncle was no stranger to childhood cancer or to St. Jude. Juan José is president and CEO of Pollo Campero, which helps raise nearly $2 million annually for pediatric cancer research and treatment in Guatemala.

A chicken restaurant chain with more than 200 locations in seven Latin American nations as well as the United States, China, Indonesia and Spain, Pollo Campero is the primary corporate sponsor of the St. Jude International Outreach Program in Guatemala.

With Pollo Campero’s support, St. Jude helped establish a pediatric cancer facility in Guatemala’s lone public hospital, Unidad Nacional de Oncología Pediátrica.

This charitable groundwork was laid long before Juan José learned that his nephew had cancer. Ironically, Juan José was already scheduled to present a
It’s not surprising to hear Stephan dispensing cheerful guidance to other St. Jude children to ease their concerns. “I would imagine it is quite easy for a near teenager to be upset and angry at what he has to endure, but not Stephan,” says Candice Duffy, RN. “He has chosen to look at his journey through a different set of eyes.”

A different person

Before his diagnosis, Stephan spent most of his time listening to his favorite band, Linkin Park; cheering the Miami Heat NBA team; or goofing off with his friends and their miniature Schnauzer, Sancia. He still loves those things, but the cancer, chemotherapy and monthly visits to St. Jude have helped him grow into a more sensitive, intuitive person, according to his mom and uncle.

“He is teaching us how to live, and we have all experienced his transformation,” Juan José says. “His understanding of life is 100 percent different than it was in the past.”

It’s not surprising to hear Stephan dispensing cheerful guidance to other St. Jude children to ease their concerns. “I would imagine it is quite easy for a near teenager to be upset and angry at what he has to endure, but not Stephan,” says one of his favorite nurses at St. Jude, Candice Duffy. “He has chosen to look at his journey through a different set of eyes. He remains upbeat, drawing strength from his family, and most importantly, his faith.”

Stephan’s journey has brought inspiration to both friends and strangers. Two weeks after his surgery, he was greeted with applause and warm support as he stepped out of a car at a fundraising run in his home town. Stephan took the first lap around the park along with a host of cancer survivors, who were eager to take photos with him.

And there’s the story of two of his classmates, who were moved enough by Stephan to begin attending church again. “They found out I had cancer, and now they’re going to church every Sunday, and all the kids are praying,” Stephan says of his sixth-grade classmates. “I feel really good that I’m able to help change people.”

Guest of honor

It didn’t take long for others to realize how special Stephan was, as well. He and his family attended the fifth annual FedEx/St. Jude Angels and Stars Gala earlier this year. Stephan was the guest of honor at the event, which was chaired by entertainer Daisy Fuentes. He danced with Fuentes, won the silent auction prize of a basketball signed by the 2006 NBA champion Miami Heat, and played the drums on stage.

“Stephan was the star of the night, and all of the attention was for him,” Patty says. “Everybody was in shock. They couldn’t believe he was playing the drums.”

By the end of the night, Stephan sympathized with celebrities who are hindered by the paparazzi, but he wasn’t eluding any flash bulbs. “It was really cool because I felt famous,” Stephan says. “People came up to me and asked for pictures. I didn’t want to say no because that would be rude.”

Graduation day

Few days will be as memorable as the one in early June when Stephan graduated from fifth grade alongside Christian. Stephan, an honor roll student since first grade, and Patty both arrived at the ceremony thinking he would not graduate because he had missed so much school during treatment.

Stephan sat with his classmates and even wore the Class of 2007 T-shirt, but he was nervous because he thought he was not going to receive a diploma. He awoke that morning unsure if his blood counts were high enough to allow him to attend, but he was assured midday that he could make the trip.

What happened next sent a wave of thunderous applause through the crowd. “Our surprise was incredible when the principal called, ‘Stephan Boehme Gutiérrez. The entire school got up…parents started to applaud, and everyone was stomping their feet in joy,’” Patty wrote in a journal. “I got goose bumps all over my body, and tears were hard to hold. It was a memorable moment, and my angel, who wanted to cry, was containing himself with a great smile that I will never forget.”

While Stephan and his family understand his prognosis, it has not affected their resolve, their faith or their ability to enjoy each day together. He understands that no one is guaranteed tomorrow, so he enjoys the daily nuances of life.

Stephan loves Miami Heat star Dwyane Wade. He drives his mom crazy by banging a pretend drum during car rides. He likes to tell embarrassing stories about his younger sister. And he just happens to make monthly visits to St. Jude.

“The people here are really nice,” Stephan says of the hospital.

Patty sometimes refers to herself and her children as the Fantastic Four. The Fantastic Four know there will be tough days ahead, but this realization helps make the good times more special.

Stephan dances with supermodel and TV personality Daisy Fuentes during the FedEx/St. Jude Angels and Stars Gala. As a special guest at the fundraiser, the 12-year-old revealed in the attention, even agreeing to play the drums onstage during the event. “It was really cool because I felt famous,” Stephan says. “People came up to me and asked for pictures. I didn’t want to say no because that would be rude.”

St. Jude has helped the family gain a new appreciation of their charitable work and put a little more perspective on life.

Donation checks to the cancer treatment center are appreciated, but making a difference in the lives of other St. Jude children is what matters most.

“It is heartening to hear Stephan talk about his sister, his mom and his dad, and to realize how much they’ve appreciated their charitable work and put a little more perspective on life.”

Still, Patty says, “Our understanding of life is 100 percent different than it was in the past.”

Donation check to the cancer treatment center are appreciated, but making a difference in the lives of other St. Jude children is what matters most.

“It is heartening to hear Stephan talk about his sister, his mom and his dad, and to realize how much they’ve appreciated their charitable work and put a little more perspective on life.”

Still, Patty says, “Our understanding of life is 100 percent different than it was in the past.”

It’s heartening to hear Stephan talk about his sister, his mom and his dad, and to realize how much they’ve appreciated their charitable work and put a little more perspective on life.
Kids undergoing certain kinds of chemotherapy can lose bone density because of a loss of vitamin D. Why does that happen? St. Jude scientists find answers.

BY CARRIE L. STREHLAU

VITAMIN Deficiency

Autumn 2007 / Promise 11

“Drugs activate PXR, which turns on the CYP3A enzyme. Then CYP3A not only protects the body by getting rid of drugs, but in the liver and intestine, it can inactivate this pool of recirculating vitamin D. This decreases the amount of biologically active vitamin D in the intestine.”

“With decreased amounts of vitamin D and decreased calcium, you get decreased bone mineralization and increased bone loss,” Schuetz says. “That is just one way certain drugs are causing bone loss.”

Avoiding interactions

“Doctors are also considering trying some other therapies in combination with the cancer drugs to try to prevent bone loss and supplements to restore bone density,” Schuetz says. “There is a lot of good work being done about this bone density topic that we could someday translate to the clinic for our kids.”

“If we can design drugs that do not interact with this PXR receptor, it will help prevent such high bone loss.”
everyone has a birthday. But not everyone celebrates a "rebirth day." Reena Kunvari Shah does just that each July 4. As fireworks splay their multicolored fingers across the sky, Reena celebrates her personal Independence Day. In 2007, the thunderous blasts reminded her that exactly 10 years had passed since a transplant extinguished the pyrotechnics that raged within her own body.

Freed from the bonds of chronic myelogenous leukemia (CML), Reena now channels her energy into providing independence for others. She hopes to do that by improving global health—liberating poor and politically disenfranchised people from poverty, disease and oppression.

"I know I can’t change the whole system," she says, "but you can cause a world of change just by helping one person."

**Ripple effect**

That ripple effect began for Reena when the first life-giving drop of red liquid—bone marrow donated by a total stranger—slid through a tube and entered her body on July 4, 1997. Not only did the experience change Reena’s blood type from O positive to A positive, but it changed the ebb and flow of her hopes and desires and interests. As the daughter of a plastic surgeon and a nurse anesthetist, Reena was no stranger to the world of medicine when, at age 11, she began to suffer from headaches and lethargy. Jenny Shah took her daughter to several specialists in their Illinois hometown, including a pediatric neurologist who suggested that the young honor student was stressed from studying too much.

When Reena bumped her knee at school one day, the minor incident produced a nagging pain that radiated to her left hip. The pediatrician ordered a blood test to rule out rheumatoid arthritis. He was surprised at the results. Reena had a blood cancer called chronic myelogenous leukemia. "Her white blood cell count is about 233,000," the doctor said. "But that’s not even compatible with life!” Jenny responded. "Normal counts are between 5,000 and 10,000."

The pediatrician scheduled an appointment for Reena at St. Jude Children’s Research Hospital’s Midwest Affiliate in Peoria, Illinois. As she drove to the clinic with her parents, Reena was unaware of the diagnosis. But when they arrived at their destination, the 12-year-old quickly figured it out. "Oh great," Reena muttered sarcastically to herself when she saw the St. Jude logo on the clinic’s door. "I’ve got cancer in my knees."

After conducting further testing, the affiliate physician instructed Reena to leave for Memphis immediately. At 3 a.m., the family walked through the doors of St. Jud. 

**Needle in the haystack**

According to Wing H. Leung, MD, PhD, director of St. Jude Bone Marrow Transplantation and Cellular Therapy, CML is a slow-growing cancer. Whereas acute leukemia may hit like a hurricane, CML moves in like a gentle breeze that sighs, murmurs then roars. Looking back, Reena realizes she probably had the disease for a year before she noticed the symptoms.

At St. Jude, the Shahs learned that the only cure for this disease was a bone marrow transplant. The procedure is risky, but it was Reena’s only hope. “The transplant service has one of the highest mortality rates of any treatment area,” Leung says. “But we have about 300 long-term survivors who have received allogeneic transplants (transplants of marrow or stem cells from other people).” St. Jude has the largest cohort in the world of pediatric bone marrow transplant survivors who have had allogeneic transplants.

Reena’s parents and her brother were tested to see if they could donate marrow. When their marrow was not compatible, St. Jude turned to the National Marrow Donor Program (NMDP) to find a match. Because Reena’s father is Indian and her mother is Caucasian, physicians were concerned about her odds of finding a donor. In general, people of mixed racial heritage have problems finding donors. But Reena was fortunate. From their bank of 10 million volunteers, the NMDP identified several potential donors. St. Jude determined that one of those individuals was a perfect match: a woman named Natalie.

**Lotto odds**

Natalie was a college student in Virginia when she joined the NMDP during a campus bone marrow drive. Several years went by; she moved to Davis, California, for graduate school and forgot about the registry. Then she received a letter from the NMDP. Would she be interested in undergoing further testing to determine whether she would be a suitable donor for someone who needed a transplant?

“When I found out that I could be a match for someone, there was no question in my mind: ‘I have to do this.’ It meant saving a person’s life,” Natalie explains. “I felt like I had won the lottery.”

“If we had not been able to find a donor, Reena would have been left with no options,” Leung says. "Unrelated bone marrow and stem cell donors are really heroes to me. They save another person’s life out of kindness; they aren’t blood relatives or even friends—they’re strangers. It’s pretty amazing.”

While Natalie was preparing for the bone marrow harvest, Reena was in Memphis, undergoing radiation and brutal chemotherapy to kill the leukemic cells. “My hair fell out, I couldn’t eat or drink; my gums and mouth turned into one big, raw sore,” Reena recalls. “It felt like I had broken glass all the way down my throat. I couldn’t even swallow for days. I couldn’t talk, and it hurt to cry.”

Kathleen Knowles, a graduate student at St. Jude during that time, remembers Reena’s courage. “Her attitude was just remarkable,” Knowles says. "Many days she obviously felt horrible, but she would still put a smile on her face and make an effort. I always felt uplifted when I left her room.”

Finally the day arrived. In California, Natalie arose early and nervously drove to the hospital for the bone marrow
“St. Jude has the largest cohort in the world of pediatric bone marrow transplant survivors who have had allogeneic transplants.”

harvest. Because of privacy regulations, she knew only that the recipient would be “a 12-year-old girl” and that the marrow would be flown to the recipient.

At 5 p.m. on July 4, Reena received the healthy bone marrow. Even Jenny’s medical training had not prepared her for the surprises that would occur afterward. “The last unit of platelets Reena got before her transplant were mine—O positive,” Jenny says. “Then they injected Natalie’s marrow. The next unit of platelets they hung on the pole was A positive.”

**Family affair**

Reena sailed through the recovery period with relative ease. Because of NMDP privacy regulations, bone marrow donors and recipients cannot divulge their identity until a year after transplant; then, if both people agree, they may meet or correspond directly. Soon after the transplant, Reena and Natalie began writing “Dear Donor” and “Dear Recipient” letters to one another. The NMDP served as intermediary, removing identifiers and forwarding the missives. The Shahs tried to imagine what Reena’s donor would be like. Would she be of Indian descent? Would she and Reena look alike or have similar personalities or interests? Finally, NMDP allowed the two to meet. “As it turns out, Natalie is the absolute opposite of Reena,” Jenny says. Reena is gregarious; Natalie is more reserved. Reena’s hair and complexion reflect her Indian heritage, while Natalie’s fair skin, light brown hair and blue eyes display her Latvian and Polish-Irish background.

Although they share marrow, this donor and recipient are also linked at the heart. A Shah family photo includes Natalie, clad in a flowing Indian sari. And when Natalie married earlier this year, the Shahs traveled across the country to attend her wedding. “There’s no way for other people to comprehend how much Natalie means to all of us,” Jenny says. But Natalie says that she has also benefited from the relationship. “I’m so blessed and so overjoyed to know that I had this in my life and to know that I was able to help save Reena,” she says.

Inspired by the fact St. Jude accepts children without regard to their ability to pay, she raises funds for the hospital each year. “I understand more than anybody that it takes a lot of money to run the hospital every day,” Reena says. “Everybody there gets the same standard of care—regardless of their economic situation.”

**World of change**

Reena’s passion is searching for ways to make life better for people around the globe. She has traveled to Chile to study the educational system and poverty; she has spent time in Brazil, where she studied community-based responses to the issues of poverty and environmental destruction. And in the summer of 2007, she traveled to South Africa, where she worked with women and children who have become dehumanized by poverty, HIV/AIDS and the society in which they live.

“We spent time with a community of women who live on the rubbish dumps,” she says. “We got to play with their children and talk with the women about their hopes and dreams. It was a powerful experience.”

A 2007 honor graduate of the University of San Francisco, Reena plans to enter the Peace Corps Masters International Program, which will allow her to serve two years in the Peace Corps while pursuing a master’s degree in public health. Given her fluency in French, she hopes to work eventually in West Africa. Reena knows that she owes her life to St. Jude and to Natalie. On July 4, 2007, Reena spent her 10th “rebirth day” touring her donor around the hospital. Now Reena wants to return the gift that has been given to her. Her generous spirit is evident in everything she does—whether she’s distributing socks and food to street people in San Francisco, raising money for a hospital in Memphis or embarking on a career to improve the health of people around the world.
Eradicating Ewing

Investigators throughout St. Jude attack one disease—Ewing sarcoma—from different directions.

BY LIN BALLEW

Only a backache. What teenager hasn’t had one? Carrying heavy books, slouching in bean-bag chairs and moving to the latest tunes can make muscles throb. But when mild discomfort suddenly becomes paralysis, something is definitely wrong.

That’s how Nevada teenager Alexa Walker found out she had Ewing sarcoma, a rare tumor of the bone or soft tissues.

The term “cancer” wasn’t part of Alexa’s consciousness in January 2005. She was getting ready to become a teenager, but even those happy plans were put on hold.

“I received the diagnosis two days before my 13th birthday,” Alexa recalls. “It’s really hard to explain how I felt. It was scary—amazingly scary.”

Melinda Walker, Alexa’s mom, remembers the event as if it occurred yesterday. Alexa had experienced a range of symptoms from a back ache to tingling and pain in her legs and feet.

Doctors were unable to identify the cause of her problems. “Then one morning she woke up and was paralyzed from the waist down,” Melinda says. Even after an MRI identified a tumor, Melinda never considered cancer. “I guess I just didn’t want to put that in my head,” she says. “I’d never heard of Ewing sarcoma before. I was in denial.”

Ewing sarcoma—also known as Ewing sarcoma family of tumors and primitive neuroectodermal tumor, or PNET—was first identified in 1921, but its mysteries are only now being solved.

Some of the chief sleuths in that effort are conducting their investigations in the clinics and labs at St. Jude Children’s Research Hospital.

Step by step

Scientists probing the genetic components of this disease have discovered that the cancer occurs when chromosomes swap places and cause two genes to fuse. One of the partners in this fusion is always the EWS gene; the other partner is FLI-1, one of several closely related genes from the e74 gene family.

The result is a new gene that can transform a healthy cell into a malignant one.

Ewing sarcoma was one of the cancers treated at the early days of St. Jude. In 1962 the survival rate for Ewing was only 5 percent, but while diseases like acute lymphoblastic leukemia have improved from 4 percent to 94 percent, Ewing sarcoma has only improved to about 65 percent.

St. Jude scientists have conducted several Ewing studies through the years that have added chemotherapy and drug-enhancing agents as well as other methods for reducing the number of cancer cells.

This research has benefited children and helped international groups develop multi-institutional studies.

“We learned that adding ifosfamide and etoposide was helpful for children with previously untreated Ewing sarcoma, and that treatment intensification, with better support, was also beneficial,” says Carlos Rodriguez-Galindo, MD, Oncology. “With these basic elements of treatment, we can now cure approximately 70 to 75 percent of children with localized Ewing sarcoma.”

Questions to answer

With the news of cancer still swimming in her head, Melinda wasn’t ready for 75 percent survival figures. “I was thinking that it should be 90 percent. I was looking up everything on the Internet I could find,” she recalls.

The largest obstacle researchers have in tackling Ewing sarcoma is the tiny amount of tumor they can obtain during biopsy. Unlike leukemia, a blood cancer, where large samples can be obtained and stored for future testing, only small portions of Ewing sarcoma tumors can be removed. Surgeons attempt to spare as much surrounding tissue as possible, which leaves only a small amount of tissue for biological research.

Scientists use the tissue they obtain to pinpoint a diagnosis and to study the tumor’s cellular structure and genetic makeup. After those studies are conducted, little tissue is left for additional research. This lack of tissue for biological research probably contributed to the fact that the disease remains a mystery even though it has been studied for nearly a century.

Scientists have not reached a definite consensus on what type of normal cells allow for the formation of these tumor cells, or exactly how the EWS/FLI-1 fusion gene contributes to tumor formation. Some of the basic science research conducted at St. Jude attempts to answer these questions.

New approaches

Suzanne Baker, PhD, of St. Jude Developmental Neurobiology conducted a laboratory study with a goal of understanding the function of the presumed culprit, EWS/FLI-1, by introducing it into all cells in the...
Ewing sarcoma was first identified in 1921, but its mysteries are only now being solved. Some of the chief sleuths in that effort are conducting their investigations in the clinics and labs at St. Jude Children’s Research Hospital.

Peter Houghton, PhD, of St. Jude Molecular Pharmacology works with student intern Zachary Inman in the lab. Houghton’s team is discovering in the laboratory the best way to use drugs in the clinic. The system was the model for a current nationwide system of such projects funded by the National Cancer Institute and led by St. Jude. The hope is that this effort will help improve the survival of children with the disease.

**Targeted results**

Contributing to those efforts are the work of Barry Shulkin, MD, Scott Snyder, PhD, and Elizabeth Butch, PhD, all of St. Jude Radiological Sciences. Since about 2002, St. Jude has been using its Positron Emission Tomography (PET) scanner to measure glucose as it is metabolized.

“Active tumors usually consume glucose, or sugar, and labeling a glucose molecule with a radioactive element allows researchers to map in more detail the location of the tumor and how it reacts to various treatments,” Snyder explains. “A treatment can be given, the patient can get scanned again, and scientists can determine if the treatment is reaching the intended target.”

The Radiological Sciences colleagues are taking a step into the future with this technology. Instead of using simple glucose forms that are presently commercially available, the scientists are planning to create “designer” radiolabeled agents that are much more targeted and yield greater results in the laboratory and the clinic. The consequences of such an approach are significant; this is the first step to creating an individualized treatment plan specific to a unique tumor, such as Ewing sarcoma, which will help doctors improve clinical trials.

St. Jude efforts to unravel the secrets of Ewing sarcoma extend across the country and around the world. Alexa received her chemotherapy treatments in Nevada. When it was time for radiation, she qualified for a St. Jude protocol. Thanks to the care she received in Memphis, the main things on Alexa’s mind are hanging out with her friends, focusing on her studies and looking for concerts to attend. Being “amazingly scared” simply isn’t part of her world anymore.

**Bone marrow compartment.** In this experimental system, expression of the Ewing sarcoma-derived fusion gene quickly produced an extremely aggressive form of leukemia.

Baker and her team of researchers were surprised that this new model showed that EWS/FLI-1 could promote leukemia so rapidly when the fusion gene has not been found in human leukemia. Although the experiment did not generate an Ewing sarcoma, it provided a new model for studying the cancer-promoting effects of EWS/FLI-1. Researchers hope to use this model in future experiments to fine-tune control of EWS/FLI-1 by directing more selective expression of the gene only in specific cells. These investigations may help scientists better understand the cell types that can bring about Ewing sarcoma—and ultimately understand more about this devastating cancer.

Another research team led by Peter Houghton, PhD, of St. Jude Molecular Pharmacology approaches basic research with Ewing sarcoma differently. He and his colleagues use models to test drug functions against Ewing sarcoma with the ultimate goal of finding the most effective treatment with the fewest side effects.

This pioneering program at St. Jude is eliminating the trial-and-error approach to finding the best drug and the right doses for children. In fact, it’s so successful that it was the model for a current nationwide system of such projects funded by the National Cancer Institute and led by St. Jude.

The program is designed to address the unfortunate fact that virtually all new cancer drugs are designed for adult cancers. Physicians traditionally had to spend precious time juggling different combinations and doses of adult drugs to yield greater results in the laboratory and the clinic. The consequences of such an approach are significant; this is the first step to creating an individualized treatment plan specific to a unique tumor, such as Ewing sarcoma, which will help doctors improve clinical trials.

**Meanwhile, in the clinic**

Alexa’s doctor, Fariba Navid, MD, Oncology, is working to improve the survival statistics for Ewing sarcoma. Navid has developed a new protocol, or treatment study. Her approach takes aim at the blood supply that feeds the tumor.

Angiogenesis is the process by which cells are enabled to form blood vessels and feed tissue. Having a healthy blood supply is great for the body’s muscles and organs, but that same process also helps tumors survive and grow. Scientists are interested in cells that will attack tumor vasculature, or tumor blood supply.

ANGIO1, a new Phase I study opening at St. Jude, is looking specifically at a combination of new drugs to kill off the blood supply to the tumor. Findings from ANGIO1 will be incorporated into the treatment study for Ewing sarcoma.

(From left) Barry Shulkin, MD, Elizabeth Butch, PhD, and Scott Snyder, PhD, all of St. Jude Radiological Sciences, are planning to create “designer” radiolabeled agents to map where tumors are located and how they react to specific treatments. This is the first step to creating an individualized treatment plan specific to a unique tumor, such as Ewing sarcoma, which will help doctors improve clinical trials.
His jeans are Wranglers, his boots are worn and his shirt is top-stitched, country western plaid with pearly snaps. While it may not sound like typical angel attire, the only thing that appears to be missing from Darren Warren’s wardrobe are his wings—but they are there; you just can’t see them.

Cancer survivor and rising country western music artist Darren Warren shares the blessings of having friends in high places.

In his career, Paul Sobolik helped put Americans on the moon. In his retirement, he helps save children on Earth.

The former engineer for Boeing says his top priority is to help children in need. He does that by supporting St. Jude Children’s Research Hospital and other charities that benefit young people.

“I guess I’ve always had a rapport with children, even though I’ve never had any children of my own,” he says, “so helping them is important to me.”

MISSION TO THE MOON

Born and raised in the Midwest, Paul went to work for Boeing in Seattle immediately upon graduating from Purdue University in 1951. After initially working on the B-52 bomber, Paul was transferred to Huntsville, Alabama, in 1962. For the next five years he helped design and develop the first stage of the Saturn Moon Rocket. He was then sent to the Johnson Space Center in Houston, where he worked with astronauts and others in monitoring the moon missions. Later in his career, he was transferred to New Mexico to work on a secret airborne laser system. Paul liked the area and chose to make it his home when he retired in 1982.

Hiking all day in the nearby Sandia Mountains and playing golf were his favorite pastimes, but recent heart problems have caused him to curtail physical activity. However, he still enjoys short walks on some of his favorite trails.

Paul has never toured St. Jude, and now does little traveling. But he says the information he receives as a donor strengthens his commitment to support the hospital’s research and treatment of children with cancer and other catastrophic diseases.

“Learning about the children who are helped—and those who don’t make it—makes me even more interested in helping St. Jude,” he says.

To learn more about making a gift to St. Jude or other planned giving opportunities, call ALSAC Gift Planning at (800) 395-1087 or e-mail giftplanning@stjude.org.
A survivor of non-Hodgkin lymphoma (NHL), Darren Warren regards the diagnosis he received when he was 16 as a gift. It hardly seems heaven-sent, but Darren has transformed that life-threatening experience into the pursuit of a dream.

The amazingly talented, up-and-coming country western singer, songwriter and musician has cut two CDs and opened for Travis Tritt, but one of Darren’s greatest passions is giving back to St. Jude Children’s Research Hospital, the institution he credits for saving his life. This unpretentious, self-proclaimed country boy with a voice as big as his heart takes major detours to perform benefit concerts, gets up with the chickens to promote the hospital on morning radio shows and goes the extra mile to bring his manager and crew to St. Jude so they can see for themselves. He gives of himself with a tireless, refreshing, it’s-not-all-about-me attitude.

Maybe it’s his zest for life, his humility or the way he is firmly grounded in his faith, but Darren is so busy seeing beauty in the world that he wouldn’t dream of looking for it in himself. “If it wasn’t for me to stay on this earth, well… I’m not very good looking, but I could make a pretty angel,” he says with a hearty laugh, never realizing that he already is.

Friends in high places

A typical teenage boy, Darren enjoyed all the things his rural Kentucky hometown had to offer: playing ball with his friends, riding four-wheelers, working at his dad’s construction company and singing in the church where his father preached. One autumn afternoon in 1998, Darren was imagining how it would feel to hold the keys to the brand-new, Chevrolet pick-up he had been eying when he reached up and felt something else—a pronounced lump under his chin.

Doctors thought it was a cyst until they surgically removed it. “It was inflamed and irritated, and they realized that something wasn’t right,” Darren recalls. Tissue samples were immediately sent off for testing.

Darren went ahead and bought that truck, and like a rusty nail in a new tire, the cancer diagnosis caught up with him a few days later.

“That’s a shocking place to be when you’re 16 years old,” Darren says. “It’s shocking at any age, but at 16, you think you’re invincible.”

Even bullet-proof boys have to allow themselves a moment to “do what anybody would do,” as Darren says. So he retreated to his room, stretched across his bed and cried.

When just enough time had passed, his mom quietly entered the room and sat down beside him.

“She said, ‘Look at me.’” Darren recalls, with an intensity that strikes a chord. “So I looked at her and she said, ‘We are going to beat this. We are going to do it. And we’ve got a friend who is going to help us.’ And she pointed up to heaven.”

Then he stood up, walked outside and climbed back in his new truck—determined never to play that sad, broken record again.

Giving denial the boot

But first, Darren had to wrestle the demon of denial.

“I didn’t feel a bit sick,” Darren says, remembering the day he arrived at the hospital. “I looked straight up at that statue of St. Jude, and I knew it was for my own good to be there; at the same time, it felt like hell on earth because I kept thinking, ‘This can’t be right. Just a few days ago, I was hanging out with my friends, and everything was fine.’”

Darren was still in shock, and he really wanted to think through things, to pray through things and to make a decision about his treatment that he felt good about—both intellectually and in his heart,” explains John Sandlund, MD, of St. Jude Oncology. “He approached the situation in an extremely mature way and always kept a positive attitude.”

When Darren came to terms with the diagnosis of NHL, a cancer of the lymphoid tissues and the third most common malignancy in children, he was treated with a regimen similar to the institutional protocol for acute lymphoblastic leukemia, which calls for more than two years of chemotherapy.

He responded well to the therapy, went into remission at the expected time and has been cancer free for eight years, according to Sandlund, who Darren describes as “the best guy that God has pretty much put together.”

Darren also formed a close connection with Gwenndolyn Anthony, RN, of the hospital’s Ambulatory Care Unit.

“When I first met Darren, I realized what a special patient he was,” Anthony says. “He was brave, and he had a heart to help others. I consider myself blessed to have been a part of Darren’s care.”

Stepping stones

In addition to the support of St. Jude staff, family and his friend upstairs, Darren found solace in music.

“You can take the bad things in your life, and you can make them a stumbling block or a stepping stone,” says Darren, who began creating song lyrics at age 5. “There were times when I sat down and told my guitar how I felt, and I realized I had created a song—and there are times I realized I had just created something that needed to be left in that little room.”

Darren never lacked for inspiration at St. Jude. In fact, he wrote every song on his Tears are a Language CD during treatment. “Go Get My Angel,” one song that deals with love and loss, has already touched thousands of people.

“I was doing a morning radio show, and after the song aired, every line lit up. People were calling in—people who had been touched by the song and people who had tied to St. Jude,” Darren says. “When we stepped outside, my manager said, ‘What do you think about that? And I just broke down crying.’”

“It’s been a dream of his ever since his treatment to give back to St. Jude in some way,” says Darren’s mom, Sharon Warren. “That dream has kept Darren’s feet firmly planted on those stepping stones, even as his music career begins to soar. Darren says that virtually every aspect of his music career is built around what he and his crew can do for St. Jude.

What drives his commitment?

“I tell people it’s like God put a bundle of angels that he hand-picked to work at St. Jude,” Darren says. “From the doctors to the nurses to the people who mop the halls, everybody was so sweet and caring. You don’t find that anywhere else.”

No, you don’t—unless you’re Darren Warren looking in a mirror at one of the prettiest angels there ever was.

To hear Darren Warren’s music, visit www.darrenwarren.com.
Perspective

Closer Than You Think

“St. Jude research doesn’t just benefit the children who walk through the doors of the hospital, but kids everywhere—in the United States and around the world. I’m a direct beneficiary of that research.”

By Kevin Sharp

W hen I was a teenager living in California, I thought Memphis, Tennessee, was very far away. I had heard of St. Jude Children’s Research Hospital because of watching the TV programs from time to time, but I didn’t dream that their work would ever affect me or anyone I knew.

Then I got cancer.

It was Ewing sarcoma that had spread from my leg to my lungs. I was treated in a California hospital—on a protocol from St. Jude.

Memphis suddenly seemed a lot closer.

Since that time, I’ve learned that St. Jude shares its discoveries freely. Their research doesn’t just benefit the children who walk through the doors of the hospital, but kids everywhere—in the United States and around the world. I’m a direct beneficiary of that research.

I’d be surprised if there is anybody who hasn’t been affected by cancer on some level, whether a friend or family member or themselves. I think a lot of people are under the impression that, wherever they live in the country, Memphis is far away. They might wonder why they would ever benefit from donating to St. Jude. The answer to me is obvious. Since I have been affected by cancer, I want to be a part of trying to find the answers that will eliminate this disease.

And what a blessing it is that St. Jude treats children regardless of their ability to pay. I was fortunate, because my family had insurance when I got cancer as a teen. If we had not had that coverage, it would have destroyed my family financially. It’s hard enough to deal with the fact that you may lose a loved one or a child; on top of that to be worried about financial needs is just way too much. St. Jude realizes that.

I’ve had the opportunity to visit St. Jude numerous times, even sharing my experiences with families at the hospital’s Survivor Day celebration. As a patient, it’s beneficial to hear that there is life after cancer—that you can continue and that you can succeed. Sometimes situations are far more difficult than we seem to be able to handle. We all have our cross to bear and our different tragedies and trials in life, and it’s important that people know that they can see it through to the other side—that it’s tough, but it’s worth it. Spreading that message is just a part of who I am.

I’ve also had opportunities to support St. Jude through my role as part of the country music community. It’s a way to thank the hospital for what they did, not just for me individually, but what they do for childhood diseases and cancer treatment around the world.

St. Jude definitely will always be a part of my life. So many people and organizations played a role in saving my life. I can’t imagine going through those experiences without helping to make opportunities available to others.

Kevin Sharp is an award-winning country music artist, entertainer, author and motivational speaker. He recently published Tragedy’s Gift: A Cancer Survivor Story, a chronicle of his battle with cancer and the lessons he learned from that experience. To learn more about his work, visit www.kevinsharp.com.

Give thanks for the healthy kids in your life.

And give to those who are not.
Randy Owen performs during the 50th anniversary of ALSAC, the hospital’s fundraising organization. At the event, Owen was also presented with the Founder’s Award—an honor that Danny Thomas only bestowed on very special occasions. “I know if my father were here, he would want Randy to have this award,” said Tony Thomas. Lead singer of the legendary country group ALABAMA, Owen helped start the Country Cares for St. Jude Kids® fundraising program in 1989 after meeting Danny Thomas. The program has become one of the nation’s most successful radio fundraising events, garnering more than $310 million in pledges for the hospital. In accepting the award, Owen acknowledged the fans of country music, the men and women of country radio and the country music industry for embracing Danny Thomas’ dream.