

Camp Sunshine--Sept. 2012

by Robin Huiras

While Fall 2012 is still a year away, please mark your calendars now for Dyskeratosis Congenita Outreach's second family weekend at Camp Sunshine in Casco, Maine.

Located on Sebago Lake, Camp Sunshine offers families affected by life-threatening diseases the chance to connect with others in a natural setting that's both peaceful and invigorating.

Largely staffed by trained and dedicated volunteers and offered completely free of charge to families, Camp Sunshine provides campers with furnished rooms, individualized attention and an unforgettable experience.

Plans are already underway to make our second weekend at camp as successful as our first. Tentatively slated for late September, the 3-day weekend treats children to endless recreational activities and parents to a slate



Largely staffed by trained and dedicated volunteers and offered completely free



of sessions aimed to support and educate. Camp Sunshine's outstanding staff provides meals, medical care and counseling for as many as 30 families.



While campers are responsible for travel expenses, Dyskeratosis Congenita Outreach, Inc. is committed to helping families who are struggling to pay for the trip seek funding opportunities. In addition, DCO has limited funds earmarked to help families who are not eligible for public or private grants. DCO welcomes any and all inquiries about camp and will be posting the specific date at <http://www.dcoutreach.com/> when it becomes available. For more information on Camp Sunshine check out <http://www.campsunshine.org/>.



The DC Companion

— Fall/Winter, 2011 —

A Family's Quest for Answers

By Robin Huiras

Kaitlin Dillon was 8 years old and in the beginning stages of undergoing a bone marrow transplant before someone put the name Dyskeratosis Congenita to the illness that has affected her since the day she was born.

Described by her parents as their 'Christmas Eve Miracle' because she was born two months early on December 24 Kaitlin's prematurity, doctors' determined, was due to interuterine growth retardation.

Preemie Kaitlin had a normal stay in the neonatal intensive care unit, but later didn't hit any milestones. At 4 months old she choked when her parents Nancy and Robert introduced solid foods. Occupational therapists helped Kaitlin crawl – on her first birthday -- but she struggled to walk and talk.

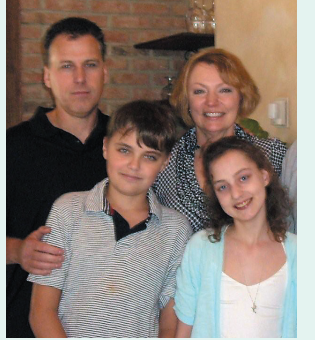
"At 19 months, 2 years, she wasn't walking, wasn't talking and I was beside myself," said Nancy, who lives with her family in

Rocky Hill, Conn. "The doctors told me it was brain damage from the premature birth and I didn't know what that was supposed to look like, but I could see the spark in her eyes."

An MRI revealed a malformation in Kaitlin's cerebellum, a trait of the DC variant Hoyeraal-Hreidarsson (HH) syndrome, was to blame for Kaitlin's developmental delays.

They redoubled their efforts, Nancy said, and by the time she was 3 Kaitlin was walking, talking and enrolled in a developmental preschool. In kindergarten she could write the alphabet and count to 20.

Then one day the 5-year-old woke up with a rash and a high fever.



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President's Corner

by Nancy Cornelius

As we approach the 3rd anniversary of the founding of DC Outreach, I am proud of all we have accomplished in such a short time. In September of 2008 the doctors at the National Institutes of Health brought many of us together for a symposium, and as I jokingly say, "locked us in a room" until we formed DC Outreach, Inc. I sometimes wonder if we would even be here had it not been for the perseverance of those doctors.

Since then, although the universe of diagnosed DC cases is still very small, we have provided support, encouragement, and information to many families struggling with this terrible disease. In the past year, we have added monthly online chat groups, half of them attended by one of our professional advisors, to our networking and communications services. We have more than doubled the number of families in our group. In addition, our presence is being increasingly felt on a global basis: within just the past few weeks, we have been able to lend a hand to families and medical professionals in Australia, New Zealand Italy, and Turkey!

As our 4th year begins, we will be embarking on another exciting phase of our mission – educating the medical community about DC – by having a presence at the annual ASH (American Society of Hematologists) conference in San Diego to disseminate information and diagnostic aids.

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If you have any suggestions for ways in which you think we can help, please contact me at snaca6@aol.com. I also urge you to please sign up onto our database on the Yahoo chat group, or send me your contact information. All personal information is kept solely by me and is strictly confidential. We are also hoping to establish a list of trusted and well-liked doctors and hospitals as well as begin to track transplant success rates at various institutions. We cannot do this without your help.

And as always, we truly need your financial assistance, too. All of our programs require monetary expenditures, and with only the small DC community to draw from, we are in constant need of donations. Please consider making a contribution, and asking your relatives and friends to do the same – perhaps in lieu of a birthday or holiday gift.

Thank you for your support.

--Nancy

Inside Issue Two of the DC Companion

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May you never be alone
Dyskeratosis Congenita Outreach, Inc.

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Recent Advances in Dyskeratosis Congenita

By Sharon Savage--DC Outreach Medical Advisor

Recent research in DC has yielded many important discoveries related to understanding its causes, applying this knowledge to understanding telomere dynamics and function, and improving clinical care of patients with DC.

Understanding the genetic causes of DC can be challenging because patients often have a wide range of medical problems. There may also be individuals affected in a family, and several forms of inheritance at work: X-linked recessive (*DKC1*), autosomal dominant (*TERC*, *TERT*, *TINF2*), and autosomal recessive (*NOP10*, *NHP2*, and also *TERT*)^{1,2}.

In 2010, the seventh cause, mutations in the TCAB1 protein (gene name *WRAP53*), were discovered to cause autosomal recessive DC³. This discovery showed for the first time that the mislocal-

ization of telomerase in the cell nucleus can cause human disease. The breakthrough opens up many new avenues for gene discovery. However, only about 60% of DC cases have an identified causative mutation, so current and future studies into its genetic causes are critical.

Scientists are very active in researching induced pluripotent stem (iPS) cells. Skin cells (e.g., fibroblasts) can become iPS stem cells by “forcing” the expression of certain genes that make the cells mimic the behavior of embryonic stem cells.

Recently, two groups made iPS cells from cells derived from patients with DC. The goal was to better understand the consequences of DC-associated mutations on telomeres and stem cell function^{4,5}.

While these studies had different findings with a specific *DKC1* mutation, they both showed that iPS cells show promise as a model system in which to study telomere dynamics in stem cells. These findings form the basis of future studies

aimed at better understanding telomere biology.

Clinical research in DC is also very active. A review of lung complications in patients with DC was included in the first case report of a patient with DC who successfully received a lung transplant for pulmonary fibrosis several years after a bone marrow transplant (BMT)⁶.

That study suggests that pulmonary fibrosis may occur earlier in patients with DC who have had a BMT compared with those who did not. However, that study was based on historical data and may not completely reflect the current era of BMT.

Current clinical studies suggest that the medical community is making improvements in BMT outcomes for patients with DC. The non-myeloablative BMT transplants so far, while limited in number, suggest that this approach may be beneficial^{7,8}. Numerous studies are ongoing and long term follow-up will be important.

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Open Board Seats and Volunteer Opportunites

Would you like to serve on the board of an international support group and help direct the future of clinical research and funding into Dyskeratosis Congenita? And do you like the idea of working with other dedicated individuals who share experiences and challenges similar to those of you and your family? Join the DCO Board!

DC Outreach Inc. is governed by a nine-member, all volunteer board, and up to two seats will be available for open nominations this November. The board usually meets via Skype on the second Sunday of each month, at 9 ET/6 PT. Come listen in to one of our meetings, to see what it's like and what's going on. Along with the serious business, we also have a good time on the board, and we try to keep the calls to an hour or so on routine nights. You don't have to join the board to “eavesdrop” on our calls. We

invite the public to quietly listen in and send us your comments and ideas afterwards.

Board seats are one-year terms, and we are proud of our high attendance rate. In the coming year, a good deal of our time will be taken up with the effort to return to Camp Sunshine in the fall of 2012. This would be the year to become involved. Camp Sunshine is a wonderful experience, and working towards that goal is extremely rewarding.

We are still a relatively new group, and we welcome all the wisdom and fresh thinking we can get. If you are at all interested in serving on our board, we would like you to sit in on at least one meeting before our elections in December. Former board members are also invited to not be strangers!

If you would like to help with fundraising, we would love to talk to you. Lately DCO has had several successful fundraising drives organized by board members (notably Rose and Dave Phillips!).

Spotlight: Dr. Suneet Agarwal

In Q&A with Mari Fearon

The DC Outreach board was delighted earlier this year when Dr. Suneet Agarwal from the Dana Farber Institute in Boston, Mass., accepted its invitation to join the foundation's medical advisory board. These positions are filled by invitation to physicians from all over the country who have an interest in bone marrow failure diseases and specifically DC.

Dr. Agarwal spoke to the families attending Camp Sunshine last September in Casco, Maine, and impressed many with his research summary and enthusiasm. Here we get to know a little more about the newest member of the Medical Advisory Board and his work.

DC Companion: How did you come to be interested in Dyskeratosis Congenita?

Dr. Suneet Agarwal: In the spring of 2008, I began studying telomeres in stem cells in the lab. I saw a boy in clinic with bone marrow failure and no other signs of

DC except for “very short telomeres.”

I attended a couple of eye opening seminars by Nobel Laureates Carol Greider and Elizabeth Blackburn on telomerase gene mutations in DC and other diseases. These experiences were a “crash course” in telomere biology and DC and I became very interested in applying new research tools to study this complex disease.

DCC: What are the most promising aspects of your research and is a cure possible?

SA: Getting stem cells from patients to study in the lab is difficult in general and from DC patients is even harder. Since stem cells are central to the problem in **DCC**, I think the most immediately important aspect of this research is that we now can make ample DC stem cells to study



and test in the lab. We can use these cells to try to understand the disease and to discover drugs that overcome the problems in telomeres and telomerase. Ideally such drugs will stall the exhaustion and failure of stem cells in DC patients, which may be the best hope for a cure for DC. Using iPS cells—induced pluripotent stem cells, which are skin cells that have been turned into embryonic-like stem cells (See DC Advisory Board article, p. 2)—to make repaired stem cells for transplantation into patients is also promising, but a significant challenge, and people are working very hard to move this forward.

DCC: Is there anything else you would like patients and their families to know?

SA: To reiterate the DC Outreach wish, “May you never be alone.” Even though DC is a rare disease, patients and families should know that there are a number of people thinking hard about DC, how to do the best research, how to provide the best care for patients and families.

(A Family's Quest...Cont'd from page 1)

“I took her to the pediatrician's and they were horrified,” Nancy said. The rash was actually petechia, something new to Nancy.

A blood test revealed a count of only 10,000 platelets per microliter. After a week in the hospital undergoing more tests, Kaitlin was released with a platelet count of 50,000 and a diagnosis of idiopathic thrombocytopenia purpura, or ITP. Adults typically have average counts of 150,000 to 450,000.

For two years Kaitlin suffered fevers and blood count crashes, and her platelets dropped lower and lower each time. Doctors tested for a variety of diseases known to cause bone marrow failure, but none came back positive.

“By now she was 7,” Nancy said, “and they told us that it looked like she was going to need a BMT (bone marrow transplant) and I said, ‘You don't even know what's wrong with her.’ ... And the doctor said, ‘It would be a whole lot easier if she had leukemia, we know how to cure that.’”

Kaitlin's physician termed it severe aplastic anemia of unknown origin and said a bone marrow transplant was unavoidable. Nancy started researching Kaitlin's symptoms online.

“And I came up with DC,” she said. “And when I told the doctor he said no girls don't get that, that's impossible. But I wasn't going to take no for an answer. Moms have a sixth sense about things – I could see her symptoms so clearly. But until you can

prove me otherwise, I'm not going to accept it.”

A subsequent phone call led to a conversation with a research nurse at the National Cancer Institute's Inherited Bone Marrow Failure Syndrome study. She sent the Dillons a telomere testing kit and directions.

A month and a half later, Aug. 30 2007, the results came back: Kaitlin has extremely short telomeres and is affected by DC.

“In a very weird way it was a relief,” Nancy said.

The diagnosis also confirmed Kaitlin's Hoyerall-Hreidarsson variant. Less than a year after learning of her diagnosis, she was accepted into Memorial Sloan-Kettering's Pediatric Bone Marrow Transplant Service, one of several such programs in the country. In January 2008 Kaitlin underwent transplant using perfectly matched cells from an unrelated donor.

“Transplant was not the nightmare, the horror, that I thought it was going to be,” says Nancy, who relocated with Kaitlin at Sloan-Kettering in New York City while her husband Robert and son Aidan stayed at home. “It was hard, but most of it was sitting around and waiting and not getting enough sleep because there is someone in your room every couple of hours.

“The kids do great – it's the parents that it's hard on.”

Today Kaitlin manages minimal effects from the transplant and issues related to DC. Like any 12-year-old she's obsessed with style and fashion and, Nancy says, can't wait to see what the 7th grade will bring.