# A Family United

For the Sze household, there is no stronger bond than family. So, when one member needed a life-saving stem cell transplant the question wasn't whether or not anyone would volunteer, but rather how quickly could each of them be tested as a possible donor.

In 2007, To Hung Sze was diagnosed with aplastic anemia, a rare but serious blood disorder that occurs when the body's bone marrow cannot produce enough healthy blood cells to function properly. The discovery was made during a routine physical after blood tests revealed low levels of red blood cells, white blood cells, and platelets.

"I was disappointed with the news, and worried about my children," says Sze, who has two teenage daughters with his wife, Jena. "For a long time, I didn't think much about it because it was not affecting my daily life."

To Hung (left) with his daugher Jingyi about to leave the hospital.

**The Long Journey**

Following the diagnosis, Sze was referred to John Koreth, MBBS, DPhil, director of Translational Research, Stem Cell Transplantation at Dana-Farber/Brigham and Women's Cancer Center (DF/BWCC). Aplastic anemia, just like cancer, can develop suddenly or slowly and has varying levels of severity. For Sze, Koreth was able to treat his condition for more than decade by utilizing a variety of different treatment options including the infusion of antibodies, and periodic blood transfusions. Blood transfusions allow patients to postpone a stem cell transplant by filling in the gaps for the body's inability to produce an adequate amount of healthy blood cells.

While these treatments were initially effective, Koreth knew they wouldn't cure Sze of his disease. Sze would need a stem cell transplant. However, they could not find him a fully matched donor, either in his five siblings or through the bone marrow registry. Sze and Koreth elected to wait and turn to a transplant only as a last resort.

In 2018, more than ten-years after first coming to Dana-Farber, Sze's disease began to progress rapidly. While they still hadn't found him a fully matched donor, deferring the procedure for more than decade had provided him with a new treatment option – Sze could now undergo a haploidentical transplant or "half matched" transplant.

For this procedure, Sze had a few options. Two of his siblings were half matches, as were his two daughters: Jingyi, 16, and Jingting, 12. Because of her age, Jingting was ruled out. Sze's siblings lived in Asia, making it difficult for them to make it to Dana-Farber – Sze came to the United States in the late 1990's to earn his master's degree from Boston University and has been here ever since. This left Jingyi as her father's best donor option.

"There was never a question in my mind if I would be his donor," says Jingyi. "Essentially, I was saving my dad's life, so why wouldn't I do it?"

"I did not expect her to volunteer, but I truly appreciated it," adds Sze. "When it came time for the procedure, I was more nervous for her, because I did not want her to suffer in any way."

**Unforeseen Complications**

Sze underwent a haploidentical stem cell transplantation in December 2018. The procedure cured him of his aplastic anemia but left him fighting a life-threatening infection. Standard transplant protocol calls for patients to be given drugs that deplete their immune system, lowering the chance that the body will reject the new stem cells, but also leaving it susceptible to infection.

During this time, Sze either contracted the Epstein-Barr virus (EBV), or the depletion of his immune system allowed it to become active again. EBV is a common virus in adults, and typically causes mononucleosis or "mono." The virus caused him to develop severe lymphoma in a complication called PTLD, or Post-transplant lymphoproliferative disorder. PTLD

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is a rare but potentially fatal complication that can occur following a solid organ transplant or stem cell transplant.

Koreth's team had to act quickly. Sze initially received an antibody treatment to deplete the EBV infected immune cells. When that didn't work, he then underwent chemotherapy to kill the r apidly multiplying cells. While this secondary treatment was effective, it required supplementation with anti-EBV immune cell infusions to eradicate the virus infected lymphocytes; this also affected Sze's bone marrow cells. Due of the therapy, Koreth had to go back to Sze's daughter for additional healthy stem cells. For months Sze fought the infection, but by April of 2019, his body had wiped out the virus.

"Without Jingyi's availability to donate additional stem cells, his blood counts may not have recovered from the intense treatments necessary to kill the EBV PLTD. She saved him twice over," explains Koreth.

Today, Sze says he's working to get back to full strength and jokes he feels like a teenager with how much time he spends on his phone. Once he has fully recovered, he'd like to travel, both to visit his family in Asia and to take his wife to various beaches.

To Hung holds a bag of his daugher Jingyi's stem cells.

**A Growing Interest**

Leading up to and then following To Hung Sze's transplant, the Szes spent a lot of time at DF/BWCC. The exposure developed into a passion for research and medicine for Jingyi. Last summer she worked as intern in the lab of Leslie Kean, MD, PhD, director, Stem Cell Transplant Center where she helped with the lab's work on clinical trials of novel agents for graft-versus-host disease. At the end of her internship, she was offered a paid internship in Kean's lab for the following summer.

"The internship showed me a whole new prospective on what being a doctor could be," explains Jingyi. "It was great to see and be a part of what's being done outside of the hospital to solve complex problems."

"Jingyi was an absolute pleasure to have in the lab. She is incredibly bright and was a great addition to the lab community. It is always particularly special when members of the lab have been personally touched by transplant because, like Jingyi, they bring a special perspective to our research. Jingyi is a gifted young scientist and I am excited to have her back in the lab this summer," adds Kean.

*— by Austin Fontanella*