



Cystic Fibrosis Canada congratulates 16-year-old, Marshall Zhang on his discovery of a new strategy for cystic fibrosis therapy development.

June 2011 - Marshall Zhang has been awarded first prize in the 2011 Sanofi-Aventis BioTalent Challenge by eminent scientists at the National Research Council of Canada for his discovery. Using molecular modeling and the SCINET supercomputer he investigated where two chemical compounds already shown to work separately in the lab might act to correct the genetic defect at the molecular level. Marshall's computer studies suggested that using the two chemical compounds together might be even more effective than each used separately because they interacted with different parts of the mutant CFTR protein called deltaF508. Using the computer, he reasoned how these two chemical compounds might work together. He then proved his "virtual" findings using living cells in culture. He found that cells treated with both drugs behaved even better than expected. The cells treated with the drugs were functioning as if they were the cells of healthy individuals not people with cystic fibrosis.

"The thrill of knowing that I was on the forefront of current knowledge was absolutely the best thing about my experience," says Marshall, adding that the lab work and "getting a taste of real research has definitely driven me towards pursuing science in the future."

Marshall's research was done in the lab of Dr. Christine Bear at The Hospital for Sick Children's Research Institute.

"Marshall's findings show that computational methods can drive the discovery of new compounds or "cocktails of compounds" that may offer effective treatment for cystic fibrosis," says his project mentor Dr. Christine Bear. "I think that Marshall has tremendous potential to be a scientist in the future because of his intelligence, motivation and determination."

SickKids' labs, fellows and CF clinic have received research grants yearly from Cystic Fibrosis Canada. Dr. Christine Bear and her associates received over \$1,420,000 in research funding for 2010. Her lab also just completed a \$3 million research grant for *Breathe*. This funding was shared amongst several investigators in the SickKids Cystic Fibrosis Research Centre and enabled the development of cell culture and animal based models of the disease. These resources allow testing of new compounds and also led to the identification of one of the compounds that Marshall tested in his computer models. This funding has also provided the training for other talented young scientists- all committed to developing therapies for Cystic Fibrosis.

"Marshall's discovery goes beyond exciting for the dedicated volunteers and families at Cystic Fibrosis Canada. To have this amazing young person look at this disease with an out of a box approach and the potential to find a cure for cystic fibrosis is remarkable," said Maureen Adamson, CEO of Cystic Fibrosis Canada. "Marshall will be a champion to usher our Canadian success story home to a cure. Our sights are set squarely on a cure and young people like Marshall will get us there."

In 2010-2011, thanks to the support of dedicated donors and volunteers, Cystic Fibrosis Canada helped fund research labs and clinics across Canada. Last year's investment of \$8 million dollars is marked by this very special discovery.

