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Researcher and student develop predictive model for secondary cancer onset

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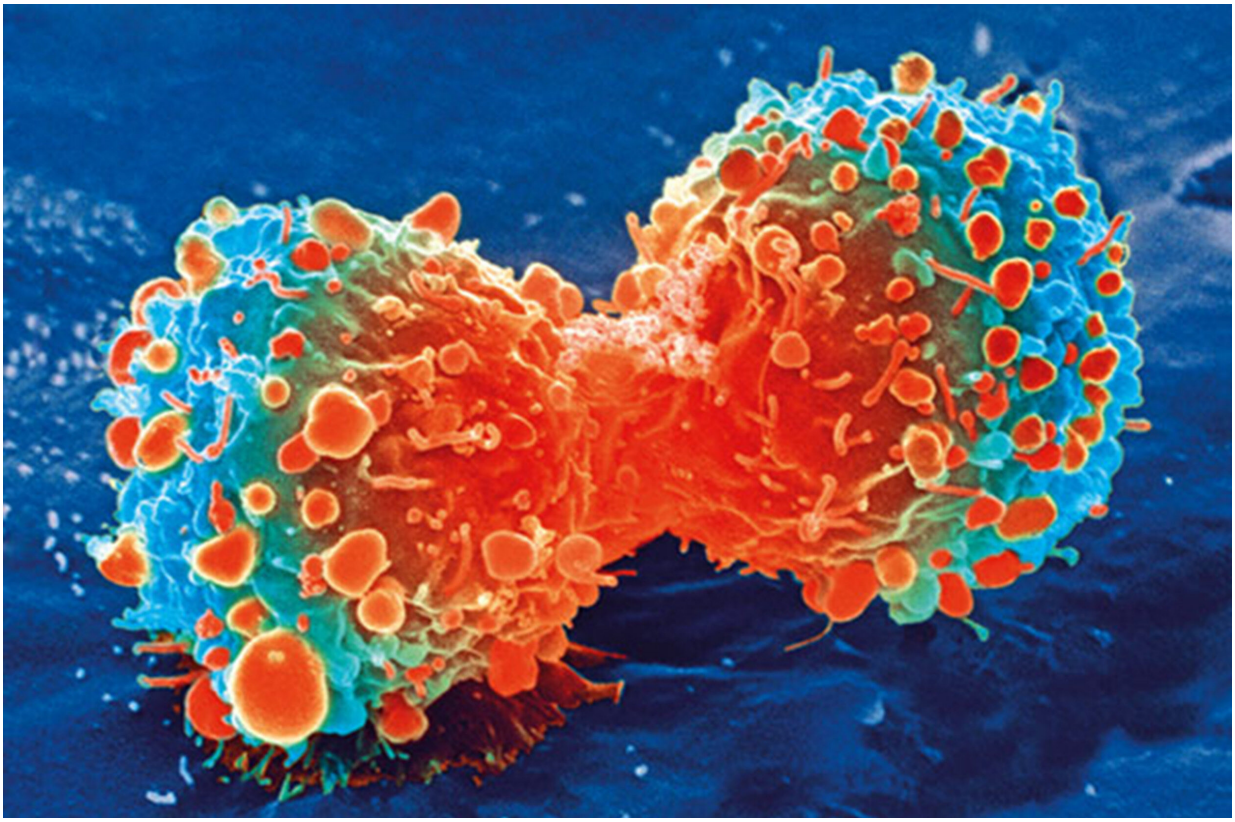

Cancer cell during cell division. Credit: National Institutes of Health

A University of North Texas researcher and a 16-year old student are working together to fight cancer with mathematics. Julia Christina Ayalde Camacho, a student in the Texas Academy of Mathematics and

Science and Xuexia Wang, an associate professor and researcher of statistics in UNT's Department of Mathematics, are working together as mentor and student to explore new ways to apply computational biology and statistics to cancer research.

"Working with my mentor, Dr. Wang, has been a great learning experience. She advised me in developing a computer program that predicts the occurrence of secondary central nervous system cancer through ensemble machine learning methods," said Camacho.

Camacho created a computer program that accepts data from many patients who survived childhood cancer, learns from that data and predicts the possibility of secondary nervous system cancer as an adult.

Children suffering from cancer were often exposed to radiation therapy, said Wang, a biostatistics specialist in the College of Science. There is a linear relation between the dosage of radiation and the risk of developing secondary nervous system cancer.

But, Wang added, it is not just about radiation. Genetics can also play a role.

"There is significant inter-individual variability in the risk for secondary nervous system cancer, which suggests a role for genetic susceptibility. Radiation, genetic variants and patient characteristics are three main types of variables that Julia's program takes into account. Using the available data, the program determines the risk of secondary nervous system cancer for survivors of childhood cancer today. It can do this for individuals as well as groups."

Wang said that advising Camacho on her project and seeing her develop a working program that can help in the fight against cancer makes being a mentor worth it.

"The mentor/student relationship is a key part of any professors' job. As a tier one research university, we have an obligation to work with students and provide the necessary research experiences needed for a career in academics and industry," Wang said. "It is important for undergrads and, in Julia's case, TAMS students to be exposed to research methods and methodology early. That is why mentorship is so important."

Provided by University of North Texas