

Breast cancer researcher granted \$1 million

Yanchang Wang searches for improved disease detection, treatment methods

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Researcher Yangchang Wang conducts his research at FSU's College of Medicine, where he hopes to find new treatments. / Natalie Michelle Rankin/FSView

As a young boy growing up in China, Yanchang Wang woke up every day surrounded by sprawling green countryside. Though just a child, he didn't simply take note that the grass was green; he wanted to know why it was green. As he grew and continued his education, Wang cultivated a fascination for the living world and its unknowns.

Willingly venturing into the unknown, Wang, now an associate professor at Florida State University's College of Medicine, was recently selected for a four-year, \$1 million grant from the National Institutes of Health. The grant will be used to further his already extensive research on finding a treatment for cancer, breast cancer in particular. Wang's research intends

to create new methods of cancer diagnosis and treatment.

Within breast cancer research, Wang's research focuses on the mechanisms within cells that allow them to control cell division in the process of mitosis. The division within cells eventually reaches a point where the chromosomes are lined up in the center of the cell. As the cell continues in the process, the chromosomes are pulled apart as the cell splits into two. Any mistake in this split and transfer of DNA material can lead to a very serious problem. A signal mechanism, however, in normal cells controls for this to make sure the DNA separates correctly.

Dr. Raed Rizkallah, an assistant scholar scientist at the College of Medicine, worked with Wang on this particular aspect of cancer research and likens this signal mechanism to a red and green traffic light. While many different types of "brakes" exist, this red and green light mechanism generally would regulate the start and stop of cell division.

The light in the analogy stays red until everything is lined up correctly within the cell at the correct stage in the process, at which point the light turns green. This signal mechanism ensures the chromosomes separate correctly between the two cells and delays division until the error has been fixed. Uncontrolled growth from a cell that is not properly regulated can lead to a buildup of tissue, which could become a tumor, and has the potential to turn into cancer.

"Intensive studies during the last two decades have given us a clear picture of the brake [or] checkpoint, but one big question is how the brake [or] checkpoint is released or silenced when the mistakes in chromosome segregation are cleared," Wang said.

"Our recent studies shed light on the mechanism of the 'brake release' process and the grant from NIH will support my research to investigate how the checkpoint is silenced. Our preliminary data indicate that defect[s] in the checkpoint-silencing also causes chromosome missegregation, which can contribute to cancer development."

Rizkallah said that the already-rigorous process of getting funding from NIH has gotten increasingly more competitive within the economic developments of recent years. It is a mark of the significant work Wang has done, he says, and a testament to the relevancy of the research's implications to the future. While there are many treatments available for cancer, a consistent problem lies in getting a treatment that only kills the unhealthy cells, rather than all cells.

"Identifying elements that are messed up in cancer cells really puts us at an edge of finding a better treatment, or a new treatment," said Rizkallah. "When we're working in cancer research we're trying to do two things: we're trying to enhance our knowledge and enhance possible therapeutic approaches that are out there today with new information or [...] hoping to identify something new that would be a new approach to kill cancer cells."

Wang says that his Ph. D. advisor, Professor Dan Burke at the University of Virginia, brought him

to the cell cycle field before he came to FSU.

“I chose the College of Medicine at FSU because I like the cooperative research environment in the Department of Biomedical Sciences,” said Wang. “Moreover, it has been amazing for [me] to see the growth of this totally new college of medicine.”

From a boyhood fascination with the unknown to conquering the unknowns of cancer development, this \$1 million grant allows Wang to study his passion.