DR. MELISSA JANE FULLWOOD

Education

Genome Institute of Singapore / National University of Singapore, PhD 2009

Research Institution

Duke-NUS

Who She Is

Dr. Melissa Jane Fullwood completed her undergraduate degree in Biological Sciences at Stanford University, with honors, distinction and Phi Beta Kappa. She received her doctorate degree from the National University of Singapore Integrative Sciences and Engineering programme, and wrote her doctoral thesis on chromatin interactions in breast cancer under the supervision of Dr. Yijun Ruan at the Genome Technology and Biology laboratory of the Genome Institute of Singapore. Her undergraduate and graduate work was performed with the support of the A*STAR National Science Scholarship and her doctorate work has also received funding from the National Institutes of Health, which is rarely given to work not performed in the United States of America. She has published research papers and reviews as a first-author in peer-reviewed journals such as Nucleic Acids Research, Journal of Cellular Biochemistry and Genome Research. She has also given a presentation at the international Keystone Symposium on Cancer Genomics and Epigenomics. She is a co-inventor on three patent filings. As she has just graduated from her PhD programme, she is moving on to the next stage of her career at Duke-NUS as a Post-Doctoral Fellow in the laboratory of Professor Shirish Shenolikar.

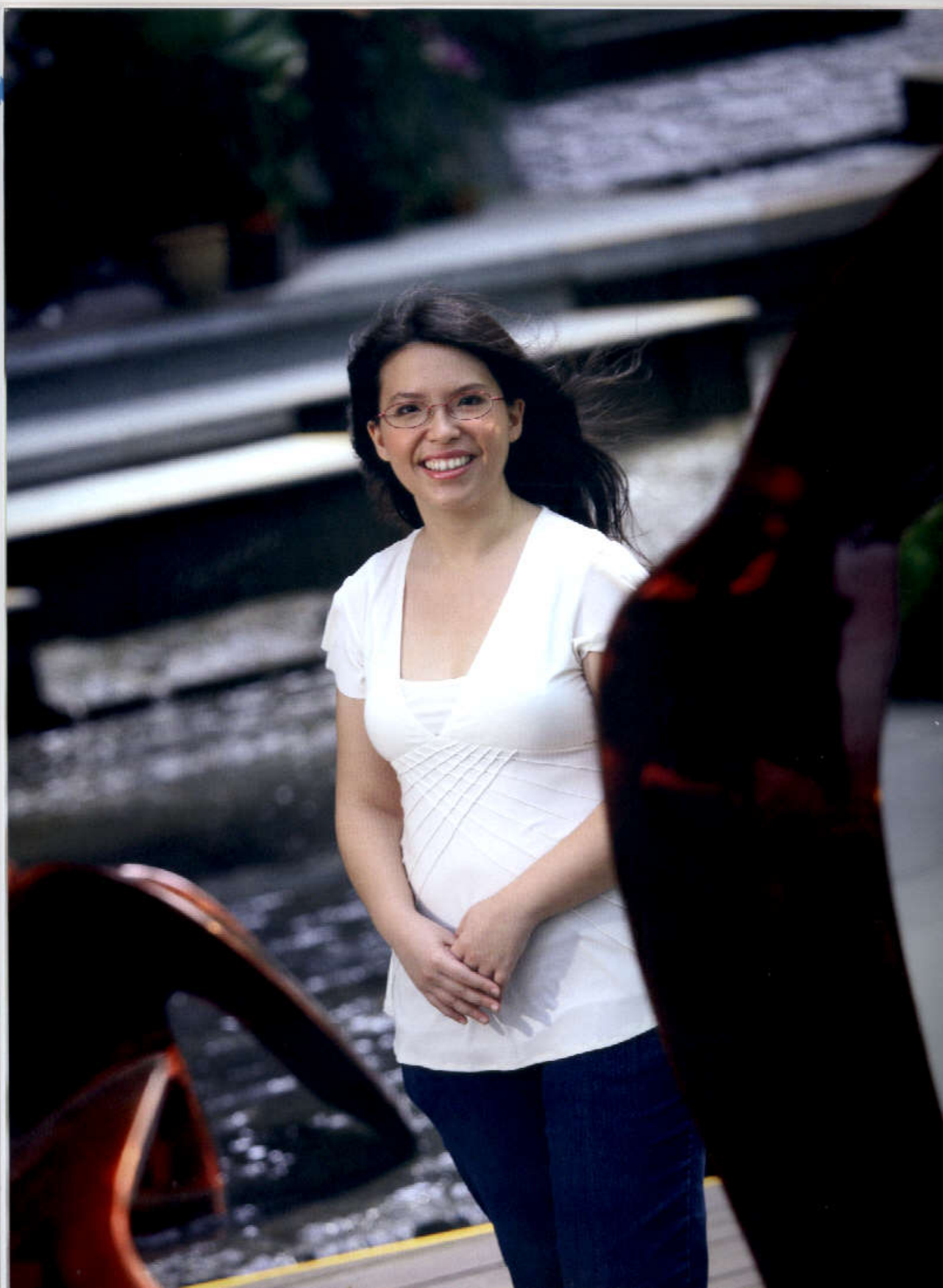
What She Does

Dr. Fullwood is interested in how diseases such as cancer can arise due to changes in cellular regulatory mechanisms. During her PhD, under the supervision of Dr. Ruan Yijun, together with Dr. Edison Liu, Dr. Chialin Wei, and Dr. Edwin Cheung of the Genome Institute of Singapore, Dr. Fullwood researched chromatin interactions - loops in the genome - by developing a new method to identify chromatin interactions. The team found, for the first time on a large scale, that chromatin interactions could be an important way for the cell to regulate its genes. During her Post-Doctoral fellowship, she will be focusing on identifying potential drug targets in cancer cells by looking for proteins which, upon perturbation by gene knockdown experiments, will lead to cancer cell death.

What That Means...

The basic building blocks of life are cells, and within cells, the genome is a very important component. The genome is typically considered to act like a "cookbook", spelling out the ingredients and recipes for the specific functions of the genes and other genomic elements. When this "cookbook" is wrong, diseases such as cancer can arise.

In functional genomics, it is actually possible to knock down a gene - to reduce its level of functioning in a cell. If the cell dies, this means the gene is probably important to maintain the cell's survival. Dr. Fullwood wishes to better understand cancer through her research and develop treatments that are more specific in killing cancer cells and hence are not only more effective but also have fewer side effects.



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IN HER OWN WORDS

Natural Affinity

"I have always asked questions about the world around me, and science gives me answers to why many things are the way they are. I have had a natural affinity to the subject ever since I began studying science in Primary 4. A major milestone in my life was participating in the International Biology Olympiad as part of the Singapore team. We were led by a team of professors who were incredibly passionate about science and generous in sharing their knowledge. This crystallized my interest in science into the determination to do research."

Back To Basics

"I entered science because I wanted to help people. However, as one of the youngest PhDs, I sometimes lose focus when navigating the complicated world of being a scientist. Deciding which area of research to focus on was one of the roadblocks. At the end of the day, I believe in going back to basics - remembering why I went into science in the first place. That's what keeps me on track."

Importance Of Mentors

"Because research requires a lot of commitment, I think that building good support networks is necessary in order to juggle personal life and work. My parents have greatly encouraged me since young, and over the years, many scientists have gone out of their way to mentor me. I would like to take this opportunity to especially thank Professor Edison Liu, executive director of the Genome Institute of Singapore, who has been mentoring me for over 7 years now - that's more than a quarter of my lifetime!"