



“PRESS”ING INTO BREAST CANCER RESEARCH:

Pushing the Known Limits

Often times, when we think of breast cancer, we think of an elegantly looped pink ribbon—a symbol signifying a woman’s personal battle with breast cancer, and the support of those who recognize that valiant fight. But, perhaps, a more appropriate symbol that captures the essence of these female fighters is a superhero herself—Wonder Woman.



Michael Press, MD, PhD

By way of breast cancer research, Tower Cancer Research Foundation is helping these women—these wonder women—strengthen their powers to fight this disease.

Jessica M. Berman was one of these magnificent wonder women who courageously wrestled with breast cancer; she fought for four years until she tragically passed away on August 24, 2014. In her honor, her husband, David Berman, established the Jessica M. Berman WONDER WOMAN WALK for Breast Cancer, which has funded two of Tower’s \$500,000 Senior Investigator Grants for innovative breast cancer research. Jessica’s legacy as “a warrior princess fighting for good,” as her husband describes her, lives on through the groundbreaking research set in motion by Tower.

It is not just those battling cancer that can be called superheroes, but also those grappling with the science to advance treatment and, eventually, discover a cure. One such superhero is Dr. Michael Press of USC’s Norris Cancer Center, the recipient of the second Senior Investigator Grant funded by the Jessica M. Berman Wonder Woman Walk. He is without a doubt, a brilliant pioneer and “Superman” in the field today.

Let’s learn a little more about the man beneath the cape. Dr. Press holds the Harold E. Lee Chair in Cancer Research at the University of Southern California Norris Comprehensive Cancer Center. He is a Professor in the Department of Pathology and the Leader of the Clinical Laboratories at USC. He also directs both the USC Breast Cancer Analysis Laboratory and the Central Laboratory for the Translational Research in Oncology/Cancer International Research Group. With this incredible catalog of accomplishments, one might never guess Dr. Press’s first aspiration—to be a garbage collector. As a boy, he would follow garbage trucks around on his tricycle, telling his mother that he wanted to be one of those “big powerful men that could just throw the trash around.” His loving mother would nod, knowing that he was destined for a different path.



The field of cancer research is eternally grateful for his dreams deferred. A shift took place when he was ten years of age, after having a series of childhood illnesses. In his own words, he “saw doctors in action, in a healthcare setting as a patient. They seemed to be very helpful and made a difference.” Needless to say, Tower couldn’t be more appreciative that he is now making that difference himself.

The field of breast cancer appealed to Dr. Press not only intellectually, but also emotionally as he had family members who had been affected by the disease. While training at the University of Chicago, an institution with a long tradition of investigating steroid hormone receptors as they impact breast cancer management, Dr. Press solidified his direction. He began collaborating in the lab with one of world-renowned professor Elwood Jensen’s post-doctorate fellows. His contribution helped lead to the discovery of steroid hormone receptors, which are predictive markers in identifying which patients will respond to anti-estrogen therapy. And that’s only the beginning of Dr. Press’s mark on cancer research.

When he became a professor at USC in 1988, he began to focus on a gene called the Human Epidermal Growth Factor Receptor Type 2, or HER2—research that is very well recognized by the medical community. His laboratory was instrumental in numerous clinical trials evaluating the effectiveness of several novel anti-HER2 drugs which ultimately saved lives. Today, there are 33% fewer deaths of women with breast cancer who have this alteration.

Presently, with the \$500,000 Jessica M. Berman Memorial Fund Senior Investigator Grant from Tower, Dr. Press is working in his laboratory to better understand one of the molecular genetic alterations in breast cancer. Specifically, he is focusing on a protein called Polo-like Kinase 4, or PLK4. PLK4 is a gene that codes for a protein that regulates cell division. Dr. Press’ laboratory has a few distinctive aims, the first of which is to entirely understand the internal workings of PLK4. The second is to observe a pharmaceutical inhibitor and its interaction with 54 human breast cancer cell lines to understand

how it functions in preventing cancer cells from dividing. Dr. Press explains, “We anticipate that some patients will have cancers whose cell division will be effectively blocked by an inhibitor to PLK4, while others will have cancers where the inhibitor doesn’t have very much impact on cell division.” This knowledge can then be used to predict which patients’ tumors, contingent upon the type of breast cancer, will be impacted by these pharmaceutical inhibitors, thus improving the efficacy of breast cancer treatments.

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Dr. Press’ laboratory is also working in collaboration with Dr. Dennis Slamon’s group at UCLA, and Dr. Tak Mak’s group at the University of Toronto. Dr. Mak’s group has generated a series of these pharmaceutical inhibitors that are currently being screened to find a principal compound that can be utilized in clinical trials, and eventually, in treating patients. One of these inhibitors, CFI-400945, is in Phase I Clinical Trials in order to identify the appropriate therapeutic dosage to treat patients with minimal adverse effects.

What makes Dr. Press’ research so groundbreaking, is that he’s not only building on preexisting knowledge, but as a result of preliminary investigations, he has identified functions of PLK4 that were not considered “functional activities”

before. “That’s what my career in medicine has been all about. It’s not about applying what’s already known. The incentive for doing research in a lab of any kind is to be able to push what’s known further,” he says passionately. “So, people suffer less toxicity, and the outcomes are more favorable. It’s tragic that patients are dying from this disease. Although, there have been tremendous improvements, especially for HER2 positive breast cancer, we’d like to do the same thing in others.”

For this reason, Dr. Press is both deeply moved and very grateful that Tower and the Berman family would provide such generous grant support to advance new treatment. With a heartfelt tone in his voice, Dr. Press explains, “It’s a very humbling position to be put in, and I’m inspired by what they’ve done. It’s one of those things that motivates an investigator to keep moving forward.” Carry on, superheroes!