



Behind the Science Dr. Kristi A. Eglund, PhD

Komen grantee Dr. Kristi A. Eglund, PhD is an Associate Scientist at the Cancer Biology Research Center and an Assistant Professor in the Department of OB/GYN at Sanford School of Medicine at the University of South Dakota. This is her story.

“You have breast cancer.” These four words have changed the lives of many women over the years. Dr. Kristi Eglund is no exception. This young breast cancer survivor began battling the disease as a researcher long before her own diagnosis. Dr. Eglund developed her passion for research during biology classes as an undergraduate at Washington University in St. Louis where she had the opportunity to work in a real laboratory through a work-study program.

Later, as a PhD student at the University of Iowa, Dr. Eglund worked in a bacteriology lab studying light-making bacteria in squid. While studying squid may seem far removed from breast cancer research she explains, “When you are getting your PhD you are really learning how to think scientifically. I learned how to ask specific questions, how to design experiments and how to manipulate and look at how genes turn on and off. Using bacteria as a model system was an excellent way for me to learn.”

During her PhD studies Dr. Eglund met a young scientist from another lab who always seemed to be around when she most needed assistance. She laughs as she recalls, “At the time I thought it was a coincidence.” Kristi and Paul later married and both continued their studies at the National Institutes of Health where Dr. Eglund joined a lab that was studying immunotherapies, which use the body’s own immune system to fight cancer. Immunotherapy’s were already being used to treat single cell cancers like lymphoma and leukemia, but Dr. Eglund thought there could be a way to use this type of treatment in the solid tumors of breast cancer.

With the help of a Susan G. Komen Career Catalyst Research award, Dr. Eglund established her own laboratory to test her idea. She had two primary goals - to identify new ways to treat breast cancer and to develop a simple blood test that could detect breast cancer at an early stage. These research goals became even more of a driving force when she was diagnosed in 2007 with invasive Triple Negative Breast Cancer (TNBC) that had spread to her lymph nodes.

Like many young women, Dr. Eglund found that her cancer diagnosis interrupted the various roles that she identifies with on a day to day basis. Dr. Eglund wears many hats including wife, mother, scientist, and now survivor. She recalls, “When I was actually undergoing treatment for breast cancer, the lines between the hats were completely blurred. I couldn’t separate the hats and I didn’t do a very good job at any of them. I didn’t have the energy to be a full time mother and it was hard for me to focus on my research because I kept comparing myself to the cases that we were studying. As far as being a wife, my husband had to take over most of the jobs in the household in order to support me, so that was tough.”



“My science gives me hope and that is what makes me feel like I have control over the disease. Instead of worrying that I’m going to have a recurrence and that I’m going to die, I try to use this experience to make myself a better scientist.”

More than five years since her diagnosis, Dr. Eglund is able, once again, to separate all of the hats, except scientist and survivor. She explains, “Every time I come to work and work on breast cancer, I’m always reminded that I had the disease. I can never get away from it.”

Today, Dr. Eglund is focused more than ever on her research goals and is making progress toward creating a blood test for detecting breast cancer. She explains that her research team is trying to use the immune system as a biosensor for cancer - it can sense the presence of cancer cells and then make antibodies that attack them. The presence of these antibodies in the blood indicate that breast

cancer is present.

By performing a simple blood test to measure the antibodies, doctors can determine whether or not a woman has cancer, lessening the need for biopsies to diagnose the disease. The test can also help detect cancer recurrence and metastasis at an earlier stage. Dr. Egland's team has now applied for a patent on the blood test.

Dr. Egland carries the patient perspective with her everywhere she goes. This is apparent in the way that she designs the clinical studies that are verifying her cancer-detecting blood test. For example, instead of requiring another blood draw, the blood needed for Dr. Egland's test is taken while the patient is already giving blood for other testing. This way, patients do not have to endure another needle stick. It may not seem like a big deal, but Dr. Egland knows that patients sometimes don't know if they can endure anything else, no matter how seemingly insignificant. She says, "Instead of having the *one more thing* be another needle stick, the *one more thing* is to hopefully make a difference in someone's life in the future. Maybe we will find something good in the gift they are offering by giving us their sample."

"I'm so passionate about trying to find this blood test because as a scientist, I want to be able to take my blood, run a test and *prove* to myself that I don't have cancer."

In fact, Dr. Egland did not exempt herself from providing a sample. She explains that she would not ask her patients to do something she would not do herself. Dr. Egland's tumor was not found early and after what was needed for diagnostics, the rest of the 4cm tumor was harvested for research. She keeps it at her desk as a constant reminder of her journey and often uses slices of it for new procedures so she does not have to waste the precious patient samples.



Dr. Egland often speaks publicly about her passion for science, her journey and her work. She says, "I have a love/hate relationship with cancer. I love studying it and I hate having it." She uses her opportunities for speaking with people about the importance of research. She discusses the wider implications that reduced scientific funding has for the breast cancer field. "Science is so important for so many reasons. People forget that not only does science provide jobs that support families, as well as education and training for future scientists. Its huge," she explains. Further, Dr. Egland challenges us to look toward the future and understand that fewer scientists conducting research now will lead to fewer new treatments and advances in the decades to come.

Reflecting on her experiences Dr. Egland recalls a pivotal moment in the process, "Going through breast cancer treatment gave me time to think about myself and how I define myself. I want to be the one who does the right thing and every day I try to make the effort to be the good friend, wife, mother and scientist. I want to be able to stand up for what I believe is right. When I meet people, hopefully they will know that I have their interests at heart and I'm a good, fair and loving person. At the end of the day, I think that is the most important thing."

Part of being the person she strives to be is working as a breast cancer advocate because Dr. Egland wants people to know that no one is exempt from, or at fault for, being diagnosed with breast cancer. Referring back to her science, she explains, "Breast cancer originates from cells which are living things that grow and divide. Sometimes cells make mistakes and we can't control that." She encourages women to go see a doctor if they feel something is wrong. "While the disease is out of their control, what is in their control is taking care of themselves, seeing their doctors and getting healthcare," she reminds us.

[Read](#) more about Dr. Egland or watch a [video](#).

