I am grateful to the Breast Cancer Care and Research Fund for providing me the opportunity to attend the San Antonio Breast Cancer Symposium in December 2011. This was my first formal experience as a breast cancer advocate and it was an overwhelming amount of information to absorb. The environment was very energizing! Close to 9000 researchers, doctors, and advocates, from 90 different countries, filled the auditorium to listen to the plenary lectures and general sessions. In addition, there were smaller educational sessions at various times as well as poster sessions in the early morning and evening. The advocates were warmly welcomed at the event, especially by the Alamo Breast Cancer Foundation and the National Breast Cancer Coalition.

Following a long day of plenary lectures and educational sessions, advocates were invited to a dinner and review session sponsored by the Alamo Breast Cancer Foundation. This was a time for advocates to gather together to get to know one another and to go over the vast amount of information presented in that day. The highlight of this dinner each evening was a panel discussion with selected researchers and physicians regarding the most significant presentations of the day. The researchers and physicians answered a multitude of questions presented by the advocates.

A simple newsletter article cannot do justice to the wealth of information available at the San Antonio Breast Cancer Symposium. The conference site [www.sabcs.org](http://www.sabcs.org) contains numerous resources from the event, including the abstracts for each presentation and a webcast of most presentations. There were a few themes that particularly caught my attention that highlight research of the past, applications with present use, and hope for the future.

**Looking into the Past**

Several of the presentations spoke about past events and how they may be related to breast cancer. Various *windows of susceptibility* were identified during which time an event could take place that would change the micro-environment of the breast and thus influence the chance of a breast cancer occurrence later on in life. These *windows* included menopause, peri-menopause, pregnancy, involution following pregnancy/lactation, puberty, and even before birth while the breasts are developing *in utero*.

There are a number of risk factors that are known that offer little or no opportunity for intervention—increasing age, younger age at first menstruation, later age at first pregnancy, later age at menopause, and certain genetic factors. Unfortunately, there are so many factors in the environment that may influence the micro-environment of the breast that researchers have few recommendations for preventive actions.

This was made clear in the report released December 7, 2011 from the Institute of Medicine (IOM)--*Breast Cancer and the Environment: A life Course Approach*. The IOM is an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public according to their website [www.IOM.edu](http://www.IOM.edu). An IOM committee reviewed the current scientific literature to assess the scientific evidence regarding the relationship between the environment and breast cancer. The IOM defined environment as being anything other than an individual's genetic makeup. That is, environment includes both the micro-environment of the breast as...
well as the external environment in which the individual lives and everything that she/he is exposed to over the course of a lifetime. In addition, the committee reviewed the evidentiary standards and methodological challenges involved in conducting research linking breast cancer to the environment. The results of this research are documented in a lengthy paper available for review at www.iom.edu.

The IOM report was a disappointment because no new information was revealed since the committee only reviewed existing information, rather than conducted new investigations. Although this information has been presented previously in various formats, the IOM report centralizes the data of many research projects over a large span of time. The IOM report offered the following evidence-based recommended opportunities for women to reduce their risk of breast cancer:

- Avoid hormone replacement therapy (HRT) containing both estrogen and progesterone
- Reduce exposure to ionizing radiation from CT scans, x-rays, and other imaging tests
- Maintain or increase physical activity
- Maintain health weight especially after menopause
- Limit or eliminate exposure to consumer, workplace, and environmental chemicals that have been identified as plausible contributors to breast cancer
- Limit or eliminate consumption of alcohol
- Reduce or eliminate smoking
- Chemo-prevention treatment with tamoxifen for women who are at high risk for developing breast cancer

The IOM report also stated that exposure to hair dyes and non-ionizing radiation as emitted by cell-phones, microwaves and other electronic devices, were not linked to an increase risk of breast cancer.

Although less persuasive, there is evidence to suggest that night-time shift work, exposure to second-hand smoke, and exposure to the chemicals benzene, ethylene oxide or 1,3—-butadiene are associated with an increased risk. Exposure to these chemicals can occur while pumping gasoline, breathing auto exhaust, or inhaling tobacco smoke.

While extensive research in humans has not been undertaken, scientists also considered other environmental agents as plausible hazards based on animal models. In animal models, bisphenol A (BPA) and phthalates have both been shown to mimic estrogen, which may contribute to breast cancer development. BPA and phthalates are chemicals found in the lining of cans, plastic containers, lotion, food packaging, toys, water bottles, and receipt paper.

As with any recommendation, the risks and benefits of each behavior must be determined for each individual. Decisions to undertake any of the above recommendations should be made with the consultation of a physician. The potential risk reduction from any of these actions for any individual women will vary and may be modest. The report IOM report also reported the lack of clear evidence available to determine if the risk factors should be avoided completely or if changes in adulthood can reduce the risks that may have accumulated form exposure at a younger age.

**Looking at the Present**

Another highlight of the symposium was seeing results of translational research in genomics being manifested in the form of a new test that will help patients with newly diagnosed DCIS, also referred to as Stage 0 breast cancer, and their physicians make treatment decisions. Previously, treatment decisions
were based on tumor size, tumor grade, lymphnode involvement, and margin status. These pathological and clinical factors can now be combined with the results of a new *OncotypeDX for DCIS* breast cancer test which predicts the risk of recurrence in the next 10 years.

The presentation *A Quantitative Multigene RT PCR Assay for Predicting Recurrence Risk after Surgical Excision Alone without Irradiation for Ductal Carcinoma In Situ (DCIS): A Prospective Validation Study of the DCIS Score from ECOG E5194* provided the research background for the evidence—based usage of this new test. The *OncotypeDX for DCIS* uses a tissue sample from a breast tumor to identify 12 genes. The increased expression of these genes within the tumor is associated with an increased risk of breast cancer. This test is highly sensitive for identifying individuals that are at a the low-risk or high-risk of developing invasive breast cancer. This information will allow physicians to develop a personalized treatment plan based on the biology of the tumor. Personalized treatment will help prevent over—or under—treatment.

*OncotypeDX for DCIS* became available from Genomic Health December 28, 2012. Additional information on the new test is available at [www.oncotypedx.com](http://www.oncotypedx.com). The cost of the DCIS test is the same as the *OncotypeDX* test previously released for invasive breast cancer, approximately $4000. While this is a staggering expense, the amount of money it will save in potentially unnecessary treatment more than covers the cost of the test. Genomic Health is committed to helping individuals with the funding of the testing through insurance reimbursements and other sources.

**Looking into the Future**

The burgeoning field of genomics will continue to provide us with information that will lead to personalized treatment. A thorough understanding of the biology of the human breast is necessary for scientific advancement in the identification of the causal factors of breast cancer.

Dr. Lisa Coussens delivered an outstanding presentation on Thursday morning that increases our understanding of the biology of macrophages, a specific type of white blood cell, and the role they play in breast cancer. Previously it was believed that the immune system provided only protection against cancer. Dr. Coussens' presentation *Macrophages as Novel Targets for Therapy in Breast Cancer*, described the presence of macrophages which encourage the growth of breast cancer tumors. Triple negative and Her2+ breast cancers have an increased proliferation of macrophages. These macrophages reduce the effectiveness of chemotherapy and radiation treatments and encourage metastases. This is an example of how the micro-environment within the breast influences the growth of breast cancer. Maturation, recruitment, and activation of these macrophages are controlled by a specific cytokine, colony stimulating factor. In mouse models, when macrophage infiltration was blocked, chemosensitivity was increased, tumor growth was reduced, metastases were reduced by 85%, and there was an increase in survival. Dr. Coussens' research paves the way for drug development based on an increased understanding of the biology of macrophages and their role in the development of breast cancer.

**Advocacy: Working in the Present to Ensure a Future without Breast Cancer**

The San Antonio Breast Cancer Symposium was a fantastic way to get introduced to the world of breast cancer advocacy. As a former medical researcher, a teacher, and a breast cancer survivor, I am excited to share with others what I am learning about breast cancer. I am looking forward to gaining more training as an advocate so that in addition to providing information I can influence decisions that
are made so that effective treatments for breast cancer can be found that will reduce or eliminate the undesirable side-effects, increase quality of life and increase long-term survival. I will be pushing for identifying the cause of breast cancer and for research to determine a way to prevent it. I want to see breast cancer eradicated! Thank you again, BCCRF, for giving me this opportunity.