THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

2014-2015

ANNUAL PROGRESS REPORT

George and Barbara Bush Endowment for Innovative Cancer Research

V. Craig Jordan, Ph.D.
Professor
Breast Medical Oncology

How Your Gift is Making Cancer History®

Breast cancer is the cancer with the highest incidence in women, and the estrogen receptor (ER) is considered to be the best therapeutic target discovered in cancer. Estrogen fuels the growth of the majority of breast cancers via the ER. I am credited with having developed tamoxifen, the first targeted anti-estrogenic therapy for any cancer. Tamoxifen is credited with saving more than a million woman's lives after their diagnosis with breast cancer. Additionally, I discovered the application of the medicine raloxifene, which prevents osteoporosis and prevents breast cancer at the same time in postmenopausal women. Tamoxifen and raloxifene are the founding members of a novel group of medicines known as selective ER modulators, which aid and improve women's health worldwide while blocking estrogen action to treat or prevent breast cancer.

Despite these advances in treatment, there are two major issues to address: the incidence of ER-positive breast cancer will double in the next 15 years, and 50 percent of treated tumors will become resistant to anti-estrogen therapy. The health system will be overwhelmed unless an inexpensive solution can be applied here in America and then worldwide.

We have discovered a novel and natural process where a woman's own estrogen can kill anti-estrogen resistant breast cancer cells after long-term therapy fails. We plan to test a treatment maintenance strategy to convert breast cancer from a fatal disease to a curable disease. My vision is to apply our knowledge of breast cancer also to prostate cancer, which is the hormone-dependent disease with the highest incidence in men (androgen). We are finding that the rules for killing anti-estrogen resistant breast cancer with a "whiff of estrogen" applies to anti-androgen resistant prostate cancer that can be killed with a "whiff of androgen."

ACCOMPLISHMENTS

My ultimate goal is to create new "tamoxifen teams" and train them to be world-class. We have accomplished this task previously in four world-class cancer centers (University of Wisconsin-Madison, Northwestern University, Fox Chase Cancer Center and Georgetown University), a major university in England (Leeds University) and established and equipped the Ludwig Institute for Cancer Research in Switzerland. This past year, at The University of Texas MD Anderson Cancer Center, we have hired my final "tamoxifen team" and organized their training with an emphasis on publishing our new work and vision. Without the support of endowments like the Lisa and Sandy Gottesman Fund in honor of Tom Johnson, none of this could possibly happen. It has only been through philanthropic investment that I have had the opportunity to help impact outcomes for women, and invest in the next generation of medical scientists, who themselves go on to improve healthcare.

We have established a series of international collaborations, which enhance the impact of the remarkable facilities at MD Anderson. We have arranged to obtain a unique collection of all the world's available anti-androgen resistant prostate cancer cells. These will be used to compare and contrast mechanisms, whereby the hormone kills prostate cancer cells in the same manner as estrogen. Additionally, we have a library of breast cancer cells that are resistant to anti-estrogen therapy but are not killed by estrogen. An expanded library of these cells is being used to discover vulnerabilities that can be blocked by known, inexpensive and readily available survival inhibitors. This new knowledge will allow us to kill these cells with estrogen.

LOOKING AHEAD

Published clinical data during the last ten years tells us that anti-estrogen resistant breast cancer cells or anti-androgen prostate cancer cells are killed by estrogen and androgen, respectively, with a response rate of 30 to 50 percent. We believe that the cancer cells that respond to estrogen or androgen have actually hijacked a natural killing program known to exist in select normal human tissues around the body. The challenge is to create vulnerability in the clever cancer cells that have learned to suppress this program and survive. Our logical and innovative strategy in the laboratory is to build a library of representative resistant cells that can be used to screen for available and previously used cancer cell survival inhibitors, which will allow all resistant cells to be killed by hormones. Our goal is to increase the response rate of patients to a 100 percent and save many millions of lives.

To achieve our goal, I must expand our program with additional resources. The ultimate success of my vision could position MD Anderson as the world's leader in delivering affordable health care, which will extend or save the lives of breast and prostate cancer patients.

My vision is the most ambitious healthcare project I have proposed during my career. The Lisa and Sandy Gottesman Fund in honor of Tom Johnson has allowed us to take the first steps on this journey, to provide affordable health care for millions across the globe by treating breast and prostate cancer, which will provide disease control for the majority of patients. As we move forward to expand our projects ever year, and train new medical scientist to aid this venture, I must expand investment in our successes so that our new treatment strategy can be tested clinically. Thank you for your important role in this process. C