Carbone Cancer Center
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

December 31, 2023
Cancer Research Tax Check-off Program
Reporting Period: January 1, 2005 – December 31, 2023

BACKGROUND

In April 2004, Assembly Bill 351, establishing a breast cancer research program tax check-off, was signed into law as 2003 Wisconsin Act 176. Under its provisions, every individual filing a Wisconsin income tax return may provide any amount of additional payment or refund to support the breast cancer research program. Senate Bill 321, which revises the administration of the individual tax check-offs available under Wisconsin law, became law under 2011 Wisconsin Act 222 in April 2012. This law consolidates the breast and prostate cancer options into a single cancer research check-off option.

Under Act 222, the amount received, after administrative expenses are deducted, is divided evenly between the Medical College of Wisconsin (MCW) and the University of Wisconsin Carbone Cancer Center (UWCCC). The money must be used for cancer research and may not be used to supplant other funds available.

This funding comes at a time when opportunities abound to leverage the research capabilities at both institutions to make a significant difference for the citizens of Wisconsin in the outcomes attributed to this disease. Research conducted in Wisconsin in collaboration with colleagues around the country is directly responsible for advances in breast cancer prevention, detection and treatment that are reflected in encouraging cancer statistics. Breast cancer death rates in Wisconsin declined 41 percent since the mid-1990s, from 29.57 deaths per 100,000 in 1995 to 17.28 per 100,000 in 2017 (the most recent year for which data are available). The state also saw a rapid drop in the rate of new breast cancer diagnoses between 2000 and 2004 (from 141.6 per 100,000 to 119.9 per 100,000). However, since then the incidence of the disease has not changed. In 2005, the incidence rate was 152.47 per 100,000 and in 2016 the rate was 161.00 per 100,000.

Continued commitment in our state to innovate approaches to cancer prevention, outreach, screening and treatment is essential to continue to reduce the rate of new cancer diagnoses and deaths. Over time these resources have been used to support programs that increase access to treatment facilities in rural areas and increase outreach efforts that promote screening. This investment has had a positive impact, with 78% of Wisconsin women over 40 having had a mammogram within the past two years in 2016. While there is still room for improvement to reach the Wisconsin Comprehensive Cancer Control Plan's goal of 90% screened by 2020, the state has observed an increase in breast cancer that is diagnosed in the earlier stages (in situ), from 13 to 18.7 percent over 1996 to 2016. Among invasive breast cancers, there was also an increase in the percent diagnosed at the localized (non-metastatic) stage from 58 percent to 66 percent between 1995 and 2016. Despite this progress, breast cancer remains the leading cause of cancer in women in Wisconsin and cancer as a whole now exceeds heart disease as a major cause of mortality. For these reasons, continued research is needed to identify ways to prevent breast cancer, to increase the proportion of women who are getting mammograms and to develop more effective treatments for both early- and late-stage disease.

The UWCCC remains committed to its goals: 1) to conduct the highest quality research into the origins and control of cancer; 2) to translate these research findings to evaluation in the clinic through well-designed clinical trials with corresponding biologic endpoints whenever possible; and 3) to provide the best care possible to all cancer patients by carefully integrating high quality, cutting-edge care with clinical research in a compassionate and individualized manner.
The UWCCC primary catchment area consists of 36 counties in southern Wisconsin, with a population of 3,481,168 in 2015, or about 58% of the state's population. Of this catchment area population, 70% live in urban areas, 22% live in rural areas, and 8% live in frontier areas. In total, 91% of the catchment area population is white and 9% is non-white (3% black, 1% American Indian, 3% Asian, and 2% multi-racial). In terms of ethnicity, 6.0% of the catchment area is Hispanic. Overall, the catchment area is representative of the demographic and racial/ethnic diversity of the state.

RESEARCH PROJECT SELECTION

For many years, the UWCCC has used the same well-tested process for identifying innovative early pilot projects for funding. We use our typical pilot project procedure for soliciting, reviewing and awarding pilot projects in cancer research that will be funded by the tax check-off. A solicitation of proposals is sent to all cancer center members defining the subject matter and criteria for selection. Proposals are reviewed and ranked by the UWCCC Scientific Review Committee. This Committee, appointed by the Director, is comprised of established Cancer Center scientists with broad representation across the many disciplines that makeup the UWCCC membership. The Committee assesses the scientific merit of the proposal as well as the likelihood that the funding will produce important results, in a method similar to that used by an NIH study section. The committee evaluates, scores, and ranks the proposals in order to provide the Director recommendations for funding. All studies have Human Subjects, Animal Safety and Biological Safety approvals before commencing (if applicable).

PROGRESS REPORT ON FUNDED CANCER RESEARCH PROJECTS

This progress report covers the funding received from the cancer research tax check-off program from FY05 thru current year, totaling $1,506,933

<u>Development of High Throughput Cell Culture System for Breast Cancer Research</u>

PI: David Beebe, PhD

The project supports the development of micro scale tools to enable novel biological insights into cancer biology. A focus has been the development of improved methods to capture and analyze circulating tumor cells from prostate and breast cancer patients (in collaboration with Doug McNeel, Josh Lang, Kari Wisinski, Amye Tevaarwerk).

<u>Developing a DNA Sample Collection from DCIS Case Controlled Population</u>

PIs: Michael Gould, PhD & Amy Trentham-Dietz, PhD

Breast cancer risk is a polygenic trait. To identify breast cancer modifier alleles that have a high population frequency and low penetrance we used a comparative genomics approach. Quantitative trait loci (QTL) were initially identified by linkage analysis in a rat mammary carcinogenesis model followed by verification in congenic rats carrying the specific QTL allele under study. The Mcs5a locus was identified by fine-mapping Mcs5 in a congenic model. Here we characterize the Mcs5a locus, which when homozygous for the Wky allele, reduces mammary cancer risk by 50%. The Mcs5a locus is a compound QTL with at least two noncoding interacting elements: Mcs5a1 and Mcs5a2. The resistance phenotype is only observed in rats carrying at least one copy of the Wky allele of each element on the same chromosome. Mcs5a1 is located within the ubiquitin

ligase Fbxo10, whereas Mcs5a2 includes the 5' portion of Frmpd1. Resistant congenic rats show a down-regulation of Fbxo10 in the thymus and an up-regulation of Frmpd1 in the spleen. The association of the Mcs5a1 and Mcs5a2 human orthologs with breast cancer was tested in two population-based breast cancer case-control studies (approximately 12,000 women). The minor alleles of rs6476643 (MCS5A1) and rs2182317 (MCS5A2) were independently associated with breast cancer risk. The minor allele of rs6476643 increases risk, whereas the rs2182317 minor allele decreases risk. Both alleles have a high population frequency and a low penetrance toward breast cancer risk.

Added Value of Advanced Methods for Breast MRI Diagnosis

PI: Frederick Kelcz, MD, PhD

We are testing newer MRI methods, specifically, diffusion weighted imaging (DWI), Blood Oxygen Level Dependent (BOLD) imaging, MR Spectroscopy (MRS) and very high temporal resolution imaging to determine if these methods may add value to our routine breast MRI set of sequences.

A Biologic Study to Evaluate the Feasibility of Detecting a Potential Molecular Marker, CRD-BP, in Metastatic Colon and Breast Cancers

PI: William Schelman, MD, PhD

This project is a pilot study to assess the feasibility of a rapid new cancer detection test for CDP-BP mRNA in blood from patients with previously untreated, metastatic colon and breast cancers. The assay involves performing a reverse transcriptase polymerase chain reaction (RT-PCR) on the RNA from circulating cancer cells obtained from blood samples. Thus, the test is sensitive, noninvasive and relatively inexpensive. The RT-PCR findings will be correlated to protein expression in paraffin embedded tissue from the patients' original biopsies. Findings from this study will provide support for a larger study to assess the specificity and sensitivity of the CRD-BP assay in early colon and breast cancer detection and may also provide a therapeutic target for future drug development.

Developing a Mouse Model to Mechanistically Interrogate the Prostate Cancer Risk Associated 8a24 Genomic Regions

PI: Michael Gould, PhD

Variants in the human 8q24 gene desert have been associated with various types of cancer including prostate, colorectal and breast cancer. A hotspot of cancer-associated variants is located on chr 8, between 128 Mb and 129 Mb, roughly 200 Kb upstream of the transcriptional start site of the proto-oncogene MYC. The non-protein coding nature of the polymorphisms suggests that the causative variants may be implicated in gene expression regulation, with MYC as the obvious strong candidate. Recently, however, a functional prostate cancer susceptibility variant in 8q24 was shown to associate with transcript levels of PVT1, a pre-miRNA transcript located downstream of MYC. It is currently unknown if MYC and/or PVT1 are under control of genetic elements in the 8q24 gene desert region in a tissue-specific manner and if deregulated expression of MYC and/or PVT1 has phenotypic consequences. Using mice clone-assisted genome editing, we genetically engineered a mouse model to address these questions.

The Role of Stroma in Promoting Metastasis in Human Breast Cancer

PI: Mark Burkard, MD, PhD

Metastatic breast cancer is an incurable disease. As such, primary therapy immediately after diagnosis is focused on eradicating early stage disease and preventing metastases. Current predictors of adjuvant therapy

benefit are primarily based on anatomic distribution and properties of the primary tumor. An increasing body of evidence has highlighted the additional important roles of non-cancerous portions of tumor, i.e. stroma, in promoting or hindering tumor growth and metastasis. This study seeks to determine whether the breast stromal microenvironment is an important determinant of tumor growth and metastatic potential in early-stage breast cancer. If this is the case, it will lead to further studies to identify chemokines or cellular receptors that mediate stroma-tumor effects. Such factors may serve as biomarkers, allowing improved patient selection for adjuvant therapy. They could also serve as therapeutic targets for new treatments.

Arrayed Microchannels to Improve Circulating Tumor Cell (CTC) Capture and Analysis

PI: David Beebe, PhD

The ability to measure and characterize tumor cells circulating in the blood is evolving as a useful marker of tumor progression and a potential minimally invasive means to guide therapeutic decisions. Current technologies simply count tumor cells but do not allow function assays. If CTCs can be cultured and subjected to functional or molecular characterization, they will provide insight into tumor biology. This ability will facilitate our discovery of target individualized cancer therapies. This project will develop a microfluidic assay that can be easily interfaced with existing capture methods and provide the ability to perform functional and genetic assays of CTCs.

Obesity and the Quality of Breast and Prostate Cancer Care

PI: Amy Trentham-Dietz, PhD

There has been speculation that the quality of care that a patient receives could be related to various physical conditions such as obesity. This project will link data from two studies currently underway to jointly examine the quality of care from the patient perspective in relation to whether the treatment received was consistent with recommended guidelines for breast and prostate cancer or whether obesity played a role in the decision process.

The Role of Fusion Genes in Breast Cancer

PI: Mark Burkard, MD, PhD

Recent studies have shown that fusion genes, long known to be involved in hematologic malignancies, are also important in solid tumors. One study identified over forty candidate fusions in a single breast cancer cell line, but the importance of these fusions is unknown. These fusion genes may be oncogenic (promoting cancer growth), and thus useful for predicting response to therapy. This study will identify the oncogenic potential of known fusion genes. Being able to identify fusion genes with oncogenic potential in a patient's tumor sample could have significant impact on treatment decisions and clinical management. They could be used as therapeutic targets or markers to predict therapeutic effectiveness.

Feasibility Imaging Studies for Triple Negative Breast Cancer (TNBC) Project

PI: Wei Xu, PhD

Triple negative breast cancer is associated with poor clinical outcomes. These patients do not benefit from known hormonal or molecular therapies. Recent studies have shown that Estrogen Receptor (ER)-beta is present in 50-80% of TNBC and that activation of ER-beta inhibits cell growth in cell based assays and animal models, providing the potential for effective treatment for these patients. This small feasibility study will conform that the ER-beta can be identified with PET and optical imaging and provide a method that is superior to immunohistochemical identification that is notoriously poor due to sampling errors that arise from tumor heterogeneity.

Monitoring of Estrogen Receptor-Targeted Cancer Therapy with ^{18}F-Fluoroestradiol PET

PI: Weibo Cai, PhD

Positron emission tomography (PET) imaging with 18F-Fluoroestradiol (18F-FES) has been well-established for predicting hormone response in ERα-positive breast cancers. However, whether 18F-FES can be taken up by ERβ-positive triple-negative breast cancer (TNBC) remains unknown. Our ultimate goal is to develop/validate 18F-FES PET as a screening tool in TNBC patients to predict their response to ERβ-based treatment. To test the proof-of-principle, the propose research will determine if 18F-FES PET can measure ERβ expression and activity in TNBC.

Identify the Key Chemical Groups that Define Selective ERB/AHR Ligands

PI: Yongna Xing, PhD

Estrogen receptor (ER) and aryl hydrocarbon receptor (AHR) responds to broad cellular and environmental chemicals with shared characteristics of ligand promiscuity and ligand-specific physiological consequences. Understanding the structural basis of ligand-specific signaling is crucial for modulating the function of the receptors in cancer and autoimmune disease.

Identification of ERβ-specific Effectors in Breast Cancer

PI: Wei Xu, PhD

In order to follow ERβ functionality in triple-negative breast tumors, we propose to identify ERβ effector proteins from established breast cancer cell lines. These effectors will be used for monitoring clinical response in a Phase II clinical trial operated at UWCCC.

NaF PET/CT Repeatability, Responsiveness, and Response Assessment in Patients with Metastatic Castrate-Resistant Prostate Cancer to Bone Treated with Docetaxel-Based Chemotherapy

PI: Glenn Liu, MD

Metastatic prostate cancer causes significant morbidity as it is commonly associated with the development of bone metastases. Drug development and patient management have been hampered because we do not have a good way to assess treatment response in bone. Imaging is commonly used to assess treatment response in soft tissue metastasis; however, its application in bone metastasis is limited to diagnosis and staging only. Our main goal is to develop innovative quantitative total bone imaging (QTBI) methodology that would lead to selection of candidate imaging biomarkers and enable quick assessment of treatment response in bone. QTBI is based on: (1) extraction of comprehensive functional bone information, and (2) quantitative assessment of all metastatic lesions. We propose using ^{18}F-Sodium Fluoride (NaF) PET/CT in combination with innovative image analysis methodologies to create a functional profile of the total bone, and extract a complete panel of imaging parameters for use in treatment response assessment. Our hypothesis is that QTBI will more quickly and more accurately identify patient response to therapy.

The Role of TPL2 Kinase in Regulating Macrophage-Myeloma Tumor Cell Interactions

PI: Fotis Asimakopoulos, MBBChir, PhD

Project goals: We hypothesize that monocytes/macrophages play a major, and hitherto poorly appreciated, regulatory role within myeloma niches. Macrophage activation and cytokine secretion is regulated by the

serine/threonine kinase TPL2, a MAP3Kinase at the interface of the MAPK and NFκB pathways. We recently reported constitutive activation of TPL2 kinase-dependent pathways that regulate the magnitude and extent of proinflammatory activity of monocytes/macrophages within myeloma niches. Moreover we uncovered a cell autonomous, growth-promoting role of TPL2 in myeloma tumor cells. To make these discoveries, we used primary CD14+ (monocytic) and CD138+ (tumor) cells from our extensive tissue bank of over 300 myeloma bone marrows. Based on our preliminary data, we hypothesize that TPL2 kinase activity is essential to control macrophage activation and to regulate macrophage-tumor cell interaction in myeloma niches. We propose two Aims to further investigate the role of TPL2 in regulating macrophage-tumor cell interactions in vivo as well as to harness the effect of TPL2 on macrophage polarization therapeutically.

2016

Translating Novel Breast Cancer Genetic Markers from the Bench to the Clinic to Advance Precision Medicine

PI: Elizabeth Burnside Professor Radiology
Co-I: Amy Trentham Dietz Professor Population Health Sciences
Co-I: David Page Professor Biostatistics and Medical Informatics
Co-I: James Schull Professor Oncology
Co-I: Ming Yuan Professor Statistics

Project Goals: Broad studies examining entire genomes of breast cancer patients are identifying a growing list of individual parts of DNA sequences called single nucleotide polymorphisms, or SNPs, that appear to predict the risk of developing breast cancer. But even as more SNPs are found, improvements in risk prediction have been modest.
Dr. Burnside worked to bridge the gap between laboratory discovery and clinical practice in assessing patient risk for breast cancer. Basic research has identified many DNA sequences that correlate with a patient's breast cancer risk, but updating clinical breast cancer risk assessment tools to include that data is a slow process. Dr. Burnside's efforts include both (1) Creating updated, more effective models for evaluating a patient's breast cancer risk and (2) Developing strategies to more rapidly translate and incorporate laboratory discoveries into clinical risk assessments.

UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with the Wisconsin Oncology Network (WON) Cancer Clinics/Centers 2016

Project Goals: For CY 2016, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing with the Wisconsin Oncology Network (WON) to implement evidence-based clinical tobacco cessation interventions. The WON activities are in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Activities for CY 2016

A. The University of Wisconsin Center for Tobacco Research and Intervention (UW-CTRI) Director of Outreach (Robert Adsit) in collaboration with Kari Wisinski, MD and Ryan Mattison, MD, Co-Directors of the WON, **provided tailored training and technical assistance to help the following 16 WON Clinics with integration of evidence-based tobacco cessation treatment interventions:**

WON-Aspirus Regional Cancer Center
WON-Aurora Advanced Health Care-Racine
WON-Aurora Cancer Care-Wauwatosa
WON-Aurora Health Care
WON-Aurora Vince Lombardi Cancer Clinic Sheboygan
WON-Fox Valley Hematology and Oncology
WON-Froedtert Lung Cancer Clinic
WON-Green Bay Oncology

WON-Gundersen Health System
WON-Marshfield Clinic-Marshfield
WON-Marshfield Clinic-Weston Center
WON-Mercy Health Systems Oncology Clinic
WON-University of Wisconsin-Carbone Cancer Center
WON-UW Cancer Center-Johnson Creek
WON-UW Cancer Center-Riverview
WON-UW Health-1 South Park Oncology Clinic

UW-CTRI Outreach staff contacted each of the WON Centers based in Wisconsin with an offer of onsite tobacco cessation technical assistance. This offer included:

1. An assessment of their current practices to identify and treat their patients who use tobacco; and,
2. An invitation to collaboratively develop and implement a tobacco cessation training and technical assistance plan to meet their specific needs and workflow.

During CY 2016, UW-CTRI Outreach staff **completed 71 phone, in-person, and email training and technical assistance contacts with 247 staff at 16 of the WON Clinic sites listed above.**
Sites differed markedly regarding their stage of incorporating evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers is ongoing.

B. UW-CTRI wrote in collaboration with UWCCC co-authors an article for publication in the *Wisconsin Medical Journal* describing the baseline tobacco cessation work by the Wisconsin Oncology Network (WON) Cancer Clinics/Centers. Drs. Wisinski and Mattison who co-direct the WON, and Dr. Howard Bailey, UWCCC Director are co-authors along with key UW-CTRI staff. The article was published in the June 2016 edition of the *Wisconsin Medical Journal*.

Other 2016 Outcomes
This fund has also been used for the recruitment of two faculty; Dr. Ruth O'Regan and Dr. Lisa Cadmus-Bertram. Dr. O'Regan serves as Division Head, Hematology/Oncology, and Associate Director of Faculty Development and Education, UW Carbone Cancer Center. She is an internationally recognized breast cancer physician and researcher. Dr. O'Regan was previously a professor of hematology and medical oncology at Emory University, where she held the Louisa and Rand Glenn Family Chair in Breast Cancer Research and was the medical director at Glenn Family Breast Center of Emory University, director of the Breast Cancer Translational Research Program at the Winship Cancer Institute and chief of hematology and medical oncology at the Georgia Cancer Center for Excellence at Grady Memorial Hospital. With a highly active research program focused on identifying mechanisms of resistance to breast-cancer therapies and development of new therapies, Dr. O'Regan has been principal investigator for numerous grants and clinical trials. Her current research is focused on the development of novel therapeutic approaches to treat resistant breast cancers, including triple negative breast cancer. Dr. O'Regan has received multiple awards and is ranked by Newsweek/Castle Connolly Medical as one of the top oncologists in the nation.
Dr. Cadmus-Bertram's research focuses on the role of physical activity and obesity in cancer incidence and survivorship, with a special interest in the use of consumer-based technologies to promote healthy lifestyles. She has been the recipient of several NCI funded projects including a four year NIH Career Development Award entitled "Sedentary Behavior And Breast Cancer: Interventions And Biomarkers."

The fund has also been used to cover salary for the Phase I clinical research group including coordinator time, nurse time in clinic and trial activation specialists. Phase I research is research that tests a new drug or treatment in a small group of people for the first time to evaluate its safety, determine a safe dosage range, and identify side effects. Phase I clinical trials are historically underfunded and therefore need supplementation from institutional sources.

2017

Barriers and Opportunities for Breast Cancer Screening and Risk Reduction Among African American Women

PI(s): Dr. Ruth O'Regan and Dr. Kristen Malecki

Dr. O'Regan and Dr. Malecki investigated the factors that contribute to disproportionally worse breast cancer outcomes and survival in African American women. This project involves a multi-pronged approach of (1) Identifying what these risk factors are, (2) Working with community organizations and groups to determine current cancer knowledge and awareness among African American women, including any recurring questions or concerns, and (3) Developing more effective communication tools and support systems to help African American women understand and minimize their cancer risk.

UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with the Wisconsin Oncology Network (WON) Cancer Clinics/Centers 2017

PI: Michael Fiore, MD, MPH, MBA, Director, UW-CTRI
Report prepared by: Rob Adsit, MEd, Director of Outreach Programs, UW-CTRI, ra1@ctri.wisc.edu

Goal

For CY 2017, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing with the Wisconsin Oncology Network (WON) to implement evidence-based clinical tobacco cessation interventions. The WON activities are in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Activities for CY 2017

A. The University of Wisconsin Center for Tobacco Research and Intervention **provided tailored training and technical assistance to help the following 6 WON Clinics with integration of evidence-based tobacco cessation treatment interventions:**

WON-Hospital Sisters Health System Eastern Division
WON-Green Bay Oncology
WON Fox Valley Hematology and Oncology
WON-Aspirus Regional Cancer Center
WON-Gundersen Health System
WON-Marshfield Clinic-Weston Center

During CY 2017, UW-CTRI Outreach staff **completed 71 phone, in-person, and email training and technical assistance contacts with 138 staff at the 6 WON Clinic sites listed above.**

Sites differed markedly regarding their stage of incorporating evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers included:

- Determining patient visit flow; helping define and design staff and clinician roles and workflow relative to the identification of, intervention with, and documentation of patients who use tobacco.
- Providing training and technical assistance about brief, practical, evidence-based tobacco cessation interventions, including EHR modifications.
- Identifying and integrating sources of tobacco cessation treatment extenders, including in-clinic and in-community tobacco cessation resources as well as the Wisconsin Tobacco Quit Line.

Overall, the WON Clinics are working to make the delivery of evidence-based tobacco cessation the standard of care for all of their patients.

Support of Breast Cancer Therapies
Research focused on the development of novel therapeutic approaches to treat resistant breast cancers, including triple negative breast cancer.

20/20: Translating Novel Breast Cancer Genetic Markers from the Bench to the Clinic
PI: Dr. Elizabeth Burnside

Dr. Burnside worked to bridge the gap between laboratory discovery and clinical practice in assessing patient risk for breast cancer. Basic research has identified many DNA sequences that correlate with a patient's breast cancer risk, but updating clinical breast cancer risk assessment tools to include that data is a slow process. Dr. Burnside's efforts include both (1) Creating updated, more effective models for evaluating a patient's breast cancer risk and (2) Developing strategies to more rapidly translate and incorporate laboratory discoveries into clinical risk assessments.

2018
Oncology and Primary Care Pilot Study.
For this pilot study, researchers will conduct focus groups with smokers as well as interviews with healthcare staff in oncology settings and primary care settings. The overarching goal of the proposed research is to develop a novel intervention to increase engagement in, and access to, evidence-based smoking-cessation treatment within a clinic setting with minimal staff burden. The research will provide the necessary foundation to develop a novel intervention known as the Learn, Connect and Quit (LCQ) mobile application. Using focus groups, researchers will:

1. Determine the feasibility and acceptability of using mobile technology within the clinic exam room to present treatment-engagement focused content to oncology and primary care patients.
2. Identify key content and design features to maximize utilization of the mobile technology and engagement in evidence-based treatment.
3. Develop pilot content and determine the acceptability and engagement with the content.

$25,000. *Funded by University of Wisconsin Carbone Cancer Center's (UWCCC), and the National Cancer Institute of NIH. Dr. Megan Piper, PI.*

Support of Breast Cancer Therapies in Dr. Ruth O'Regan's lab
Dr. O'Regan's recent focus is on the development of novel therapeutic strategies for triple negative breast cancer. She demonstrated reciprocal regulation of ZEB1 and androgen receptor in triple negative breast cancer cells, an important finding given the increasing interest in the role of androgen receptor in this subtype of breast cancer. Her work also noted additive effects of lapatinib and rapamycin in triple negative breast cancers, which led to the development of a clinical trial (NCT01272141). They demonstrated that IGF1R knockdown induces mesenchymal to epithelial transition and that IGF1R can be blocked with FAK inhibition in triple negative breast cancer cells, a finding they hope to take to the clinic in the near future.

2019
Breast Cancer Research Study Pilot:
Barriers and Opportunities for Breast Cancer Screening and Risk Reduction among African American Women
PIs: Ruth O'Regan MD, Kristen Malecki PhD MPH
The following are the project Aims:

- Aim 1: To assess African American women's knowledge of, and questions about, personal breast cancer risk including neighborhood (environmental) contexts and life experiences that may increase this risk, and opportunities to mitigate these risks;
- Aim 2: To examine knowledge and beliefs regarding breast cancer screening benefits and recommendations, and how they apply to personalized screening decisions; and

- Aim 3: To determine opportunities to improve knowledge and reduce barriers regarding breast cancer prevention, risk-reduction and effective screening practices among African American women.

To achieve these Aims, we had two objectives to (1) conduct 6 focus groups with 10 African American women in each of the following counties: Dane, Rock, Milwaukee, Kenosha, and Racine and Winnebago (IL), and (2) create and broadly distribute a survey created based on focus group learning.

Objective 1:

- Developed a moderator guide, completed IRB submission and finalized revision for last change of protocol prior to field implementation- Developed the following in partnership with the UW Survey Center:
  - Focus group moderator guide and accompanying surveys
  - Electronic focus group moderator training with companion in-person Q&A
- Hired the two community-based focus group moderators and modified IRB protocol to include them.
- Completed training of the two community-based facilitators.
- Added a MPH practicum student (an MD-MPH student between years 3 and 4 of medical school at UW, who intends to pursue Oncology) to the team to aid implementation and provide learning experience.
- Established relationships in African American communities within each of the 6 target counties.
- Identified a focus group site and host organization(s) in each of the 6 counties.
- Developed a staffing plan and dates for all 6 focus groups to be held in March and April 2018.
- Recruited 20 of 60 participants, and a waiting list exists for two counties. Recruitment process is ongoing.
- Collaborating with the UW SMPH Center for Community Engagement and Health Partnerships on outreach activities in Milwaukee, Racine and Kenosha counties.

Objective 2:

- MPH student identified and collected validated tools to guide survey development.
- Student assembling "base" survey to be informed and modified based on focus group results.
- Discussed modified methods for administration – mail based vs. in person

<u>UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with Wisconsin Cancer Clinics/Centers</u>

<u>Goal</u>

For CY 2019, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing to implement evidence-based clinical tobacco cessation interventions with cancer clinics/centers in Wisconsin. This work is in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

<u>Activities for CY 2019</u>

B. The University of Wisconsin Center for Tobacco Research and Intervention **provided tailored training and technical assistance to help the following four Cancer Clinics/Centers with integration of evidence-based tobacco cessation treatment interventions:**

- Aspirus Regional Cancer Center
- Froedtert and the Medical College of Wisconsin Cancer Center (Grand Rounds)
- Marshfield Clinic Eau Claire Cancer Center

In addition, UW-CTRI presented about tobacco cessation resources, including the Wisconsin Tobacco Quit Line, at the **UW Carbone Cancer Center 2019 Fall Conference**.

During CY 2019, UW-CTRI Outreach staff **completed 19 phone, in-person, and email training and technical assistance contacts with 268 staff at the three Cancer Clinics/Centers listed above.**

Sites differed markedly regarding their integration of evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers included:

- Determining patient visit flow; helping define and design staff and clinician roles and workflow relative to the identification of, intervention with, and documentation of patients who use tobacco.
- Providing training and technical assistance about brief, practical, evidence-based tobacco cessation interventions, including EHR modifications.
- Identifying and integrating sources of tobacco cessation treatment extenders, including in-clinic and in-community tobacco cessation resources as well as the Wisconsin Tobacco Quit Line.

Overall, the Cancer Clinics/Centers are working to make the delivery of evidence-based tobacco cessation the standard of care for all of their patients.

Report prepared by: Rob Adsit, MEd, Director of Outreach Programs, UW-CTRI, ra1@ctri.wisc.edu

2020

Dr. Ruth O'Regan, lead PI for the Breast Cancer Specialized Programs of Research Excellence (SPOREs) grant

Ruth O'Regan, MD, is a Clinical PI on a recent submission for a Specialized Program of Research Excellence (SPORE) focused on addressing breast cancer. This includes a research project that expands on a previous collaborative pilot project with Dr. Kent Hoskins (University of Illinois-Chicago) to investigate mechanisms of resistance to androgen receptor (AR) signaling inhibitors (ARSIs). The central hypothesis of this project is that mechanisms of resistance to ARSIs in AR+ triple-negative breast cancer (TNBC) involve alterations in AR and AR signaling, and that this resistance can be overcome therapeutically through CDK inhibition and other approaches.

This hypothesis will be assessed through three specific aims:

Aim 1: Evaluating mechanisms of resistance in AR+ TNBC models with *de novo* and acquired ARSI resistance *in vitro* and *in vivo.*

Using a panel of AR+ TNBC cell lines with differing expression of AR and sensitivity to standard ARSIs, we will characterize AR, and correlate expression with ARSI activity. Results will be confirmed in vivo, including in patient-derived models of AR+ TNBC. We will evaluate whether the expression of PSMA in tumor specimens and by non-invasive PET imaging correlates with activity of ARSI in vivo.

Aim 2: Determining if the addition of CDKi to ARSI therapy can overcome ARSI resistance, and identifying predictive biomarkers for this approach.

Patients with AR+ metastatic TNBC will be recruited to a phase 2 clinical trial evaluating the addition of CDKi with ribociclib (RIBO) to bicalutamide (BICA), following a 2-week run in of BICA. Baseline metastatic tumor specimens and CTCs from patients recruited to the clinical trial will be assessed for AR expression, AR-Vs, PSMA and TNBC subtype and will be correlated with activity of BICA alone (decrease in Ki67) or the combination of BICA and RIBO (clinical benefit rate (CBR) at 16 weeks). Baseline PSMA expression using 18F-DCFPyL PET imaging will be correlated with change in Ki67 and CBR at 16 weeks.

Aim 3: Identifying future therapeutic approaches for AR+ TNBC.

Using AR+ TNBC preclinical models the efficacy of newer ARSIs will be evaluated and activity will be correlated with biomarkers associated with ARSI resistance. We will evaluate a theranostics approach to treating AR+ TNBC that expresses PSMA using 177Lu-PSMA TRT in preclinical models.

This research can revolutionize the treatment of AR+TNBC. First, determining which AR+TNBC are sensitive to ARSIs can allow the tailoring of these relatively non-toxic therapies to patients most likely to benefit. This could ultimately allow translation of these AR-directed agents into the early stage adjuvant setting. Second, the use of CTCs as a means of assessing the cancer in real time for presence of resistance mechanisms can allow an early determination of when and how resistance to ARSIs develops. Third, the addition of CDKi to ARSI could be an effective therapy, which if confirmed in larger trials, can allow a significantly higher percentage of patients with AR+ TNBC to benefit from these relatively non-toxic, targeted agents. Fourth, our preclinical experiments can identify other approaches for AR+TNBC that can be evaluated in future clinical trials. In summary, this research can dramatically improve outcomes for patients with AR+TNBC.

UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with Wisconsin Cancer Clinics/Centers

Goal

For CY 2020, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing to implement evidence-based clinical tobacco cessation interventions with cancer clinics/centers in Wisconsin. This work is in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Activities for CY 2020

The Covid pandemic disrupted health care for much of 2020, including cancer and oncology care. The University of Wisconsin Center for Tobacco Research and Intervention **provided tailored training and technical assistance to help the following four Cancer Clinics/Centers with integration of evidence-based tobacco cessation treatment interventions:**

Aspirus Regional Cancer Center
Froedtert and the Medical College of Wisconsin Cancer Center
Marshfield Clinic Eau Claire Cancer Center
Mercy Health System Oncology Clinic

During CY 2020, UW-CTRI Outreach staff **completed 10 phone, in-person, virtual, and email training and technical assistance contacts with 203 staff at the four Cancer Clinics/Centers listed above.**

Sites differed markedly regarding their integration of evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers included:

- Determining patient visit flow; helping define and design staff and clinician roles and workflow relative to the identification of, intervention with, and documentation of patients who use tobacco.
- Providing training and technical assistance about brief, practical, evidence-based tobacco cessation interventions, including EHR modifications.
- Identifying and integrating sources of tobacco cessation treatment extenders, including in-clinic and in-community tobacco cessation resources as well as the Wisconsin Tobacco Quit Line.

Overall, excluding the Covid pandemic, the Cancer Clinics/Centers are working to make the delivery of evidence-based tobacco cessation the standard of care for all of their patients.

Report prepared by: Rob Adsit, MEd, Director of Outreach Programs, UW-CTRI, ra1@ctri.wisc.edu

Activities for CY 2021

Goal

For CY 2021, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing to implement evidence-based clinical tobacco cessation interventions with cancer clinics/centers in Wisconsin. This work is in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Since the launch of the UW-CTRI Outreach Program in 2001 as part of a comprehensive, statewide tobacco control program, UW-CTRI outreach specialists have worked with virtually every healthcare system and insurer—as well as hundreds of clinics and dozens of hospitals across Wisconsin—to ensure tobacco users throughout the state have access to affordable tobacco treatment to quit smoking or chewing tobacco.

These outreach professionals have offices in Eau Claire, Oshkosh, Milwaukee, and Madison. They provide training and technical assistance to clinics, hospitals and health systems to create sustainable improvements to

the way they offer tobacco treatment. It's all based on research summarized in the U.S. Public Health Service Clinical Practice Guideline: *Treating Tobacco Use and Dependence*.

Calendar year 2021 funding has, in part, supported Distinguished Scientist Dr. Bruce Christiansen, who leads the Wisconsin Nicotine Treatment Integration Project (WiNTiP), which works to help behavioral health patients to quit tobacco use. Dr. Christiansen recently published an article titled Measuring Therapeutic Alliance for Tobacco Cessation Counseling for Behavioral Health Clinicians. *Journal of Smoking Cessation*. Vol. 2021, Article ID 6671899 discussing the effectiveness of Behavioral Health Clinician's interventional efforts to help patients stop smoking.

Activities for CY 2022

Carbone Cancer Center

The University of Wisconsin Carbone Cancer Center genitourinary cancer research includes prostate cancer, which is the most common cancer in men and a source of significant morbidity and mortality (>30,000 deaths annually). Current research projects combine cutting-edge basic science discoveries with clinical (surgical, medical and radiation oncologists) expertise to exploit novel observations that will improve outcomes and quality of life for patients with this disease. Using state-of-the-art imaging, bioinformatics and novel pathology resources Carbone researchers develop and exploit new diagnostic approaches and treatments that will change the way prostate cancer is managed.
Basic scientists with prostate cancer clinicians advance treatment strategies for prostate cancer patients. The broad objectives are to: 1) Increase multidisciplinary translational research and develop the next generation of prostate cancer researchers, 2) Develop common resources to promote advances, 3) Translate promising new approaches into patients, and 4) Improve overall survival and quality of life for patients with prostate cancer. This research will advance treatments and understanding of prostate cancer and undoubtedly beneficially impact patients with this disease.

The University of Wisconsin Carbone Cancer Center breast cancer research aims to meet the needs of breast cancer patients, particularly the underserved from both rural and urban settings through translational science. Breast cancer is the second most common cancer with more than 1.7 million cases diagnosed annually worldwide. In the United States, more than 270,000 cases of invasive breast cancer were seen in 2020, with approximately 42,000 patients dying from metastatic disease annually. Mortality rates are higher in underserved populations whether they live in urban or rural settings. Targeted therapies have improved outcomes for patients with certain subtypes of breast cancer. However, therapeutic resistance is common and is the primary reason for the development of metastatic breast cancer, leading ultimately to death. Moreover, there is a need for better predictive biomarkers for traditional cytotoxic therapies to optimally select patients who are likely to benefit from these agents. Given the efficacy of targeted agents in specific breast cancer subtypes, such as HER2-positive cancers, the issue of over-treatment and resulting toxicities is an increasingly significant issue. Specific objectives and goals for breast cancer research are to 1) promote translational research in breast cancer, including integrating innovative technology, targeting a diverse patient population 2) Improve outcomes and quality of life for patients with breast cancer 3) Determine mechanisms underlying therapy resistance as a means to develop new therapeutic approaches 4) Develop common resources, including patient-derived models, to be shared within and with other institutions.

Summary of Activities for Calendar Year 2022
UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with Wisconsin Cancer Clinics/Centers
December 2022

Goal

For CY 2022, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing to implement evidence-based clinical tobacco cessation interventions with cancer clinics/centers in Wisconsin. This work is in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Activities for CY 2022

The University of Wisconsin Center for Tobacco Research and Intervention Outreach Program **provided tailored training and technical assistance to help the following eight Cancer Clinics/Centers with integration of evidence-based tobacco cessation treatment interventions:**

Aspirus Regional Cancer Center
Froedtert and the Medical College of Wisconsin Cancer Center
Marshfield Clinic Eau Claire Cancer Center
Mercy Health System Oncology Clinic
Fox Valley Hematology and Oncology
Aurora Cancer Care – Wauwatosa
Marshfield Clinic Western Cancer Center
Saint Vincent Hospital Regional Cancer Center

During CY 2022, UW-CTRI Outreach staff **completed 23 phone, in-person, virtual, and email training and technical assistance contacts with 374 staff at the eight Cancer Clinics/Centers listed above.**

Sites differed markedly regarding their integration of evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers included:

- Determining patient visit flow; helping define and design staff and clinician roles and workflow relative to the identification of, intervention with, and documentation of patients who use tobacco.
- Providing training and technical assistance about brief, practical, evidence-based tobacco cessation interventions, including EHR and workflow modifications.
- Identifying and integrating sources of tobacco cessation treatment extenders, including in-clinic and in-community tobacco cessation resources as well as the Wisconsin Tobacco Quit Line.

Overall, the Cancer Clinics/Centers are working to make the delivery of evidence-based tobacco cessation the standard of care for all their patients.

Report prepared by: Rob Adsit, MEd, Director of Outreach Programs, UW-CTRI, ra1@ctri.wisc.edu

Activities for CY 2023

Area of research #1

Summary of Activities for Calendar Year 2023
UW-Center for Tobacco Research and Intervention (UW-CTRI) Tobacco Cessation Academic Detailing with Wisconsin Cancer Clinics/Centers
December 2023

Goal

For CY 2023, UW-CTRI committed to providing onsite, telephone, and electronic academic detailing to implement evidence-based clinical tobacco cessation interventions with cancer clinics/centers in Wisconsin. This work is in support of the University of Wisconsin Carbone Cancer Center's (UWCCC) cancer prevention and tobacco cessation efforts.

Activities for CY 2023

The University of Wisconsin Center for Tobacco Research and Intervention Outreach Program provided tailored training and technical assistance to help the following seven Cancer Clinics/Centers with integration of evidence-based tobacco cessation treatment interventions:

Agnesian SSM Health Cancer Center
Aspirus Regional Cancer Center
Froedtert and the Medical College of Wisconsin Cancer Center
Ho Chunk Smoking Cessation and Cancer Prevention Clinic
Marshfield Clinic Eau Claire Cancer Center
Mercy Health System Oncology Clinic
Saint Vincent Hospital Regional Cancer Center

During CY 2023, UW-CTRI Outreach staff **completed 18 phone, in-person, virtual, and email training and technical assistance contacts with 323 staff at the seven Cancer Clinics/Centers listed above.**

Sites differed markedly regarding their integration of evidence-based tobacco dependence treatment. Our work with all of the Clinics/Centers included:

- Determining patient visit workflow; helping define and design staff and clinician roles and workflow relative to the identification of, intervention with, and documentation of patients who use tobacco.
- Providing training and technical assistance about brief, practical, evidence-based tobacco cessation interventions, including EHR and workflow modifications.
- Identifying and integrating sources of tobacco cessation treatment extenders, including in-clinic and in-community tobacco cessation resources as well as the Wisconsin Tobacco Quit Line.

Overall, the Cancer Clinics/Centers are working to make the delivery of evidence-based tobacco cessation the standard of care for all their patients.

Report prepared by: Rob Adsit, MEd, Director of Outreach Programs, UW-CTRI, ra1@ctri.wisc.edu

Area of research #2

Dr. Amy Trentham-Dietz is a leading epidemiologist who studies breast cancer prevention, early detection, and outcomes. Her research has focused on the development and evaluation of breast cancer screening and prevention strategies, as well as the identification of risk factors for breast cancer. She uses novel and traditional epidemiologic approaches in her studies, complemented by methods drawing from health services research and simulation modeling.

Dr. Trentham-Dietz conducts research concerning breast cancer prevention and detection by focusing on three main areas:

- Modifiable lifestyle factors, including obesity, physical activity, and environmental exposures, to better understand breast cancer etiology and reveal avenues for prevention.
- Ductal carcinoma in situ (DCIS) of the breast, which is often detected through mammography and is a non-obligate precursor for invasive breast cancer.
- Simulation modeling of breast cancer to examine risk-based approaches for improving the balance of benefits and harms of screening.

Trentham-Dietz is a member of the American Statistical Association, the American Epidemiological Society, and the Society for Epidemiologic Research. She has served on the editorial boards of several scientific journals, including the American Journal of Epidemiology, the Journal of the National Cancer Institute, and the Journal of Clinical Oncology. She is a fellow of the American Association for the Advancement of Science.

Trentham-Dietz's research has been funded by the National Institutes of Health, the Centers for Disease Control and Prevention, and the Susan G. Komen Foundation. She has received numerous awards for her research, including the American Cancer Society's Young Investigator Award and the National Cancer Institute's Outstanding Investigator Award. **In calendar year 2023, Dr. Trentham Dietz received support from Cancer Research Tax Check-off Program**.
Trentham-Dietz is a passionate advocate for breast cancer prevention and early detection. She is committed to improving the lives of women affected by breast cancer.

SUMMARY

Successful research in many areas will be required to realize definitive positive changes in the burden of cancer. We have already seen a decline in the number of deaths, but successful outcomes in research that addresses the causes, risks, prevention, and treatment of this disease will be required to eliminate the burden of this disease. This progress report provides a status report on how the proceeds from the Wisconsin Cancer Research Tax Check-off are currently being invested by the University of Wisconsin Carbone Cancer Center to bring us closer to the day when the burden from cancer is eliminated.

Grants Resulting From State Cancer Research Tax Check-Off December 31, 2016

Grant	Agency	PI	Total Award	Title	Dates of Award
133-PRJ91UU	ASH	Asimakopoulos	$150,000	The Role of TPL2 Kinase in Regulating Macrophage-Myeloma Tumor Cell Interactions	09/14/14-09/14/15
5R01CA127379-04	NIH/NCI	Burnside	$1,079,005	Machine Learning for Improved Mammography Screening	05/01/07-03/31/12
5U01ES019466-05	NIH/NIEHS	Gould	$2,173,274	Genetics of Breast Cancer Risk at Windows of Exposure	09/01/10-04/30/15
5R01ES017400-05	NIH/NIEHS	Gould/Newton	$2,086,696	Breast Cancer GWAS: Function and Environmental Interactions	12/11/08-10/31/14
5R01CA123272-05	NIH/NCI	Gould	$2,052,776	Characterizing a Breast Cancer Modifier Locus That Associates with Human Risk	07/13/06-05/31/12
W81XWH-07-1-0404	DoD/Army	Gould	$252,059	Mechanisms Underlying the Breast Cancer Susceptibility Locus Mcs5c	07/01/07-06/30/10
W81XWH-11-1-0161	DoD/Army	Gould	$127,040	Functional Analysis of the Rat Mammary Carcinoma Susceptibility Locus (Mcs5c)	06/01/11-06/30/14
W81XWH-12-1-0085	DoD/Army	Basu	$111,067	Reactive Oxygen Species Produced by Prostate Cancer Cells Cause Castrate-resistant Cell Growth by Inducing B-Cell Lymphotoxin Release	03/01/12-02/28/13
W81XWH-08-1-0525	DoD/Army	Alarid	$111,375	Microfluidic Applications in Defining Regulatory Roles of the Breast Cancer Microenvironment	08/01/08-08/31/09
5R33CA160344-03	NIH/NCI	Alarid/Beebe	$818,072	Integrated Microscale Transcriptional Profiling of Cell Communication Networks	09/12/11-08/31/15
1R01CA185251-01	NIH/NCI	Basu/Beebe/Eliceiri	$2,868,458	[PQC-3] A Metabolic Pathway Activation Marker for Prostate Cancer Prognosis	07/01/14-05/31/18
W81XWH-09-1-0192	DoD/Army	Beebe	$515,631	Arrayed Microchannel-based Assays for Circulating Tumor Cell Capture, Culture, and Analysis	07/01/09-07/31/13

W81XWH-11-1-0208	DoD/Army	Beebe	$110,980	Inhibition of Breast Cancer Progression by Blocking Heterocellular Contact between Epithelial Cells and Fibroblasts	04/01/11-04/30/13
OPP1028788	Bill & Melinda Gates Foundation	Beebe	$2,584,034	Microfluidic Phase-Gate: Simplified Sample Preparation for POC Diagnostics in the Developing World	06/27/11-12/31/14
5R33CA137673-03	NIH/NCI	Beebe	$1,400,415	Microchannel Cell-based Assays to Enable Cancer Research	05/01/09-04/30/13
1R01EB010039-01A2	NIH/NIBIB	Beebe	$1,742,153	Understanding Cell Migration through Microscale in Vitro Models	09/01/11-06/30/15
5R01CA155192-03	NIH/NCI	Beebe/Miyamoto	$817,882	Enabling NF-kB Signal Transduction Studies in Primary Multiple Myeloma Cells	06/21/12-04/30/17
1R01CA181648-01A1	NIH/NCI	Lang/Berry Mentor: Beebe	$1,552,947	VERSA: An Integrated, Multi-Endpoint Platform for Circulating Tumor Cell Analysis	04/09/14-02/28/19
W81XWH-11-1-0648	DoD/Army	Cai	$445,454	Development of Biodegradable Zinc Oxide Nanowires Targeting Breast Cancer Metastasis	08/15/11-08/14/15
W81XWH-11-1-0644	DoD/Army	Cai	$654,418	Molecular Imaging and Therapy of Prostate Cancer	09/26/11-09/25/15
133-PRJ56DV	Pardee Foundation	Cai	$154,250	Novel Combination Therapy for Prostate Cancer	03/01/12-02/28/13
5R01CA169365-02	NIH/NCI	Cai	$887,321	Novel Combination Therapy for Prostate Cancer	04/12/13-03/31/16
RSG-13-009-01-CCE	ACS	Cai	$802,750	Imaging Biomarkers for Combination Therapy of Prostate Cancer	07/01/13-06/30/17
W81XWH-12-1-0052	DoD/Army	Lang Mentors: Beebe/McNeel	$700,785	Physician Research Training Award: Promotion of Anti-Tumor Immune Responses with Epigenetic Modifying Agents	08/01/12-07/31/17
133-PRJ54KE	PCF	Liu/Jeraj	$300,000	Developing a Novel Quantitative Bone Imaging (QTBI) Methodology to Assess Treatment Response in Metastatic Prostate Cancer	05/23/11-05/31/14
133-PRJ54XV	PCF	Liu	$634,420	Imaging Biomarkers of Treatment Response using NaF PET/CT Imaging: a Prostate Cancer Clinical Trials Consortium Effort	08/03/11-08/31/15
5R03CA139548-02	NIH/NCI	Trentham-Dietz	$147,224	The Vitamin D Pathway and Mammographic Breast Density in Postmenopausal Women	06/01/09-05/31/12
5R01CA067264-14	NIH/NCI	Trentham-Dietz	$1,728,186	Breast Carcinoma in Situ: Predicting Risk and Outcomes	03/19/09-08/31/15
W81XWH11-1-0047	DoD/Army	Trentham-Dietz	$74,251	Hormonal Factors and Breast Cancer Loci	01/01/11-01/31/13
W81XWH11-1-0214	DoD/Army	Trentham-Dietz	$229,385	Tumor Microenvironment and Progression to Invasion After a Diagnosis of Ductal Carcinoma in Situ	03/01/11-09/30/13
135-135GV92	WARF	Trentham-Dietz	$33,266	Genetic Polymorphisms in Relation to Breast Cancer Survival	01/01/08-06/30/09
133-PRJ28PK	Prevent Cancer Foundation	Trentham-Dietz	$44,463	Modifiable Risk Factors for Breast Cancer Events After Diagnosis of Ductal Carcinoma in Situ (DCIS)	07/15/09-07/14/11
5R21CA170876-02	NIH/NCI	Halberg/Schelman	$350,252	Molecular Differences Predicting Tumor Progression in Colorectal Cancer (PQ #14)	09/01/12-08/31/14
5R01GM097245-04	NIH/NIGMS	Burkard	$1,373,165	Separation of Late Mitotic Functions of Polo-like Kinase 1 with Chemical Genetics	09/01/11-04/30/16
IRG-58-011-48	ACS	Burkard	$30,000	Synthetic Lethal Screen for Chemicals Targeting Polyploidy	06/0/10-05/31/12

5R01CA125387-04S1	NIH/NCI	Xu	$94,758	Transcriptional Regulation of Estrogen Receptor (ER) by CARM1	08/01/11-01/31/13
W81XWH-11-1-0237	DoD/Army	Xu	$3,649,454	Old Receptors, New Treatment Strategies for Breast Cancer	04/01/11-04/30/16
W81XWH-11-1-0165	DoD/Army	Xu	$97,292	Targeting Estrogen Receptor-Beta in Triple Negative Breast Cancer	02/01/11-02/28/14
Total Amount			**$32,984,958**		

Publications Generated as a result of the State Cancer Research Tax Check-Off:

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3. Gaudet MM, Egan KM, Lissowska J, Newcomb PA, Brinton LA, Titus-Ernstoff L, Yeager M, Chanock S, Welch R, Peplonska B, Trentham-Dietz A, Garcia-Closas M. Genetic variation in tumor necrosis factor and lymphotoxin-alpha (TNF-LTA) and breast cancer risk. Hum Genet 121(3-4):483-90, 2007.
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5. Samuelson DJ, Hesselson SE, Aperavich BA, Zan Y, Haag JD, Trentham-Dietz A, Hampton JM, Mau B, Chen KS, Baynes C, Khaw KT, Luben R, Perkins B, Shah M, Pharoah PD, Dunning AM, Easton DF, Ponder BA, Gould MN. Rat Mcs5a is a compound quantitative trait locus with orthologous human loci that associate with breast cancer risk. Proc Natl Acad Sci U S A 104(15):6299-304, 2007. PMCID: PMC1847458
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Presentations resulting from State Cancer Research Tax Check-Off:

1. University of Cincinnati, Department of Environmental Health, April 4-5, 2011 Cincinnati, Development of assays for screening environmental estrogens. [Xu]
2. Poster presentation in FASEB summer conference of Autoimmune Disease in 2010. [Xing]
3. DoD PCRP IMPACT meeting (Orlando, FL, March, 2011). [Beebe}
4. Microtechnology in Medicine and Biology Conference (Lucerne, Switzerland, April, 2011). [Beebe]
5. Correcting Breast DWI Distortion with Reversed Phase Encoding Direction. International Society for Magnetic Resonance in Medicine (May, 2012). [Kelcz]
6. Zhang Y, Hong H, Yang Y, Engle JW, Barnhart TE, Nickles RJ, Leigh B, **Cai W**. Positron Emission Tomography Imaging of CD105 Expression During Tumor Angiogenesis. Society of Nuclear Medicine 58th Annual Meeting, San Antonio, Texas, June 2011 (**# 296, Press Release, Oral Presentation**). [Cai]
7. Yang Y, Hong H, Zhang Y, **Cai W**. In Vivo Near-Infrared Fluorescence Imaging of CD105 Expression. Society of Nuclear Medicine 58th Annual Meeting, San Antonio, Texas, June 2011 (**# 232, Travel Award, Oral Presentation**). [Cai]
8. Zhang Y, Severin GW, Hong H, Engle JW, Yang Y, Barnhart TE, Leigh BR, Nickles RJ, **Cai W**. Positron Emission Tomography Imaging of CD105 Expression with ^{89}Zr-Df-TRC105. 2011 World Molecular Imaging Congress, San Diego, California, September 2011 (**# P194, Travel Award**). [Cai]
9. Yang Y, Zhang Y, Hong H, Leigh BR, **Cai W**. In Vivo Near-Infrared Fluorescence Imaging of CD105 Expression during Tumor Angiogenesis. 2011 World Molecular Imaging Congress, San Diego, California, September 2011 (**# P163**). [Cai]
10. Hong H, Shi J, Yang Y, Zhang Y, Wang X, **Cai W**. Fluorescent Zinc Oxide Nanowires Synthesized through Kinetics Control: a New Class of Agents for Targeted Optical Imaging. 2011 World Molecular Imaging Congress, San Diego, California, September 2011 (**# P130**). [Cai]
11. Hong H, Zhang Y, Severin GW, Yang Y, Engle JW, Barnhart TE, Leigh BR, Nickles RJ, **Cai W**. Dual-Modality Positron Emission Tomography and Near-Infrared Fluorescence Imaging of CD105 Expression in Breast Cancer Lung Metastasis. 2011 World Molecular Imaging Congress, San Diego, California, September 2011 (**# T210, Travel Award, Oral Presentation**). [Cai]
12. University of Cincinnati, Department of Environmental Health, April 4-5, 2011 Cincinnati, Development of assays for screening environmental estrogens. [Xu]