



CDMRP



Department of Defense

Breast Cancer Research Semipostal Program



U.S. Army Medical Research and Development Command



Congressionally Directed Medical Research Programs

HISTORY

The Office of the Congressionally Directed Medical Research Programs (CDMRP) was created in 1992 from a powerful grassroots effort led by the breast cancer advocacy community that resulted in a Congressional appropriation of funds for breast cancer research. This initiated a unique partnership among the public, Congress, and the military. Since then, the CDMRP has grown to encompass multiple targeted programs and has managed over \$14.7 billion in research funds from its inception through fiscal year 2019 (FY19). Funds for the CDMRP are added to the Department of Defense (DoD) budget, in which support for individual programs, such as the Breast Cancer Research Program (BCRP), is allocated via specific guidance from Congress.

APPLICATION REVIEW PROCESS

The CDMRP uses a two-tier review process for application evaluation, with both tiers involving dynamic interaction among scientists and disease survivors (consumers). The first tier of evaluation is a scientific peer review of applications measured against established criteria for determining scientific merit. The second tier is a programmatic review conducted by the Programmatic Panel, which is composed of leading scientists, clinicians, and consumers. The Programmatic

Panel compares applications to each other and makes recommendations for funding based on scientific merit, potential impact, adherence to the intent of the award mechanism, relevance to program goals, and portfolio composition.



Breast Cancer Research Semipostal Program

About the Program

As a result of the efforts of breast cancer advocates, the Stamp Out Breast Cancer Act (Public Law 105-41) led to the U.S. Postal Service's issuance of a new first-class stamp, the Breast Cancer Research Semipostal (BCRS), in 1998. It was the first semipostal in U.S. history. Net revenues from sales of the BCRS, which currently costs 65 cents, are provided to two designated funding agencies, the DoD BCRP and National Institutes of Health (NIH), to support breast cancer research. By law, 30 percent of the total amount raised is allocated to the DoD BCRP, and 70 percent is allocated to the NIH. The Breast Cancer Research Stamp Reauthorization Act of 2015 reauthorized the stamp through 2019.



Research and Management Costs

Breast cancer stamp funding received by the BCRP between FY99 and FY18 has been used to fully or partially fund 67 awards. These awards were funded under mechanisms that support innovative, high-risk, high-reward research that could lead to major advancements in breast cancer (Figures 1A and 1B). Applications funded through the BCRS program were reviewed and recommended for funding according to the two-tier review system implemented by the DoD BCRP. An evaluation of the awards funded through the BCRS program shows that the projects encompass a diversity of research areas (Figure 2).

Total Proceeds from BCRS	\$25,858,015
Research	\$24,606,277
Management Costs	\$1,251,738

Figure 1A. BCRS Research and Management Costs, FY99-FY18

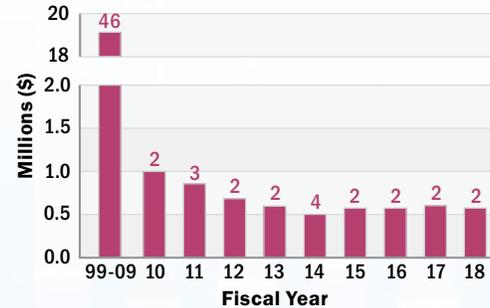


Figure 1B. BCRS Funding and Number of Awards Supported by Fiscal Year

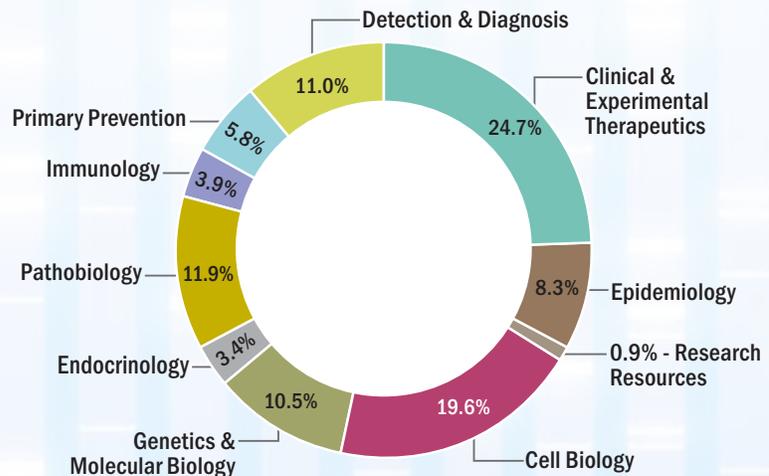


Figure 2. FY99-FY18 BCRS Award Portfolio Composition by Percent of Funding Invested

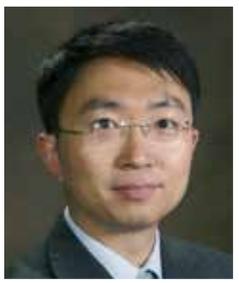
Recent Research Advancement



Damaged Progenitors as Targets for Breast Cancer Prevention

Leif Ellisen, M.D., Ph.D., Massachusetts General Hospital

The cell-of-origin in breast cancer gene 2 (*BRCA2*)-associated breast cancers is thought to be a luminal progenitor (LP) cell, and inherited mutations in the *BCRA2* gene are correlated with an increased risk of developing breast cancer. Dr. Ellisen and his team discovered a subpopulation of DNA-damaged LP cells representing the earliest pre-cancerous precursors in *BRCA2*-mutation carrier women. Dr. Ellisen first noted an increase in the proportion of LP cells in healthy breast tissue from *BRCA2*-mutation carriers that also correlated with increased age, such that older women had a higher proportion of LP cells in their breast tissue compared to younger women. In addition, of the entire population of LP cells in the breast tissue of *BRCA2* carriers, a significant number of cells exhibited gains and losses of portions of multiple chromosomes. Further analysis of *BRCA2*-mutant LP cells revealed a gene expression signature that was consistent with failed activation of cell division checkpoints and suppression of DNA damage-induced signaling of nuclear factor kappa B (NFκB), a transcription factor that plays a critical role in the cellular response to stress and DNA damage. Because deregulation of cell growth by cell cycle stress is correlated with malignant transformation, and suppression of NFκB signaling pathways is associated with increased genomic instability, these findings suggest that early DNA damage precedes visible cellular abnormalities in the *BRCA2* cancer-predisposed breast. These results provide proof-of-principle for exploiting the abnormal DNA damage and cell cycle checkpoint phenotype as a potential cancer prevention strategy for high-risk *BRCA2*-mutation carrier women. Dr. Ellisen received follow-on funding with an FY18 BCRP Expansion Award to continue his work to identify novel pharmacologic interventions for preventing the development of breast cancer in *BRCA2*-mutation carriers.



Tousled-Like Kinase 2 (TLK2) Is a Potential Therapeutic Target for Luminal B Breast Cancer

Xiaosong Wang, M.D., Ph.D., University of Pittsburgh

The luminal B subtype of estrogen receptor positive (ER+) breast cancer is more aggressive than luminal A and is characterized by poorer tumor grade, larger tumor size, a higher proliferation index, and an increased tendency to develop endocrine resistance. As reported in *Nature Communications*, Dr. Wang and colleagues developed a genome-wide analysis, ConSig-Amp, that helps to identify potential therapeutic targets in cancer from multi-genomic data sets. Using ConSig-Amp, amplification and expression of the *TLK2* oncogene were found to be highest in the luminal B subtype of breast cancer. In addition, increased expression of *TLK2* in tumor samples from breast cancer patients correlated to an overall worse clinical outcome independent of treatment with endocrine therapy. Overexpression of *TLK2* in benign breast epithelial cells and *TLK2*-low luminal breast cancer cells increased cell migration and invasion, while inhibition of *TLK2* alone or in combination with tamoxifen resulted in a significant reduction in tumor growth and increased progression-free survival in a mouse model of breast cancer. Dr. Wang and colleagues also showed that *TLK2* inhibition prevents cell cycle progression and induces apoptosis in ER+ breast cancer cell lines with high expression of *TLK2*. Furthermore, the research team identified two potential *TLK2* inhibitors, Go6983 and GF109203X, which could be used to develop future therapeutic agents to treat aggressive ER+ breast cancers that overexpress *TLK2*.

Kim JA, Tan Y, Wang X, et al. 2016. Comprehensive functional analysis of the tousled-like kinase 2 frequently amplified in aggressive luminal breast cancers. *Nature Communications* 7:12991.

High-Impact Research and Accomplishments Supported by the BCRS

- Demonstrated a relationship between breast cancer in a large prospective cohort of women and estimated outdoor concentrations of hazardous air pollutants, strongly suggesting that environmental exposure could contribute to an increased risk of breast cancer.
- Advanced understanding of the immune modulated microenvironment of post-partum breast involution that promotes pregnancy-associated breast cancer, revealing new therapeutic strategies to target immunosuppression and enhance the anti-tumor immune response.
- Second harmonic generation: a high-resolution optical microscopy technique for analyzing tumor structural changes and predicting metastasis of estrogen receptor-positive, lymph node-negative human breast cancer. Harmonigenic™ Corporation has retained the option for this patent.
- Identified predictive biomarkers for response of triple-negative breast tumors to chemo- and radio-therapy, providing the opportunity for new targeted therapeutics to resensitize breast tumors to chemotherapy and radiation treatments and ultimately reduce metastatic burden in patients.
- 171 publications
- 24 patents

Recent Publications Resulting from BCRS-Funded Research

- Chhetri A, Chittiboina S, Atrian F, et al. 2019. Cell culture and coculture for oncological research in appropriate microenvironments. *Current Protocols Chem Biol*, 11(2):e65
- DeNardo DG, Ruffell BR. 2019. Macrophages as regulators of tumor immunity and immunotherapeutic response. *Nat Rev Immunol*. 19(6):369-382
- Brenot A, Knolhoff BL, DeNardo DG, Longmore GD. 2018. SNAIL1 action in tumor cells influences macrophage polarization and metastasis in breast cancer through altered GM-CSF secretion. *Oncogenesis*. 7(3):32
- Chittiboyina S, Bai Y, Lelièvre SA. 2018. Microenvironment-cell nucleus relationship in the context of oxidative stress. *Frontiers in Cell & Dev Biol*. 6:23
- Lelièvre SA, Chittiboyina S, 2018. Microphysiological systems to study microenvironment-cell nucleus interaction: Importance of tissue geometry and heterogeneity. *Microphysiological Systems*. 2:12
- Meyer MA, Baer JM, Knolhoff BL, et al. 2018. Breast and pancreatic cancer interrupt IRF8-dependent dendritic cell development to overcome immune surveillance. *Nat Commun*. 9(1): 1250.
- Meyer MA, DeNardo DG. 2018. Better Together: B7S1 Checkpoint Blockade Synergizes with anti-PD1. *Immunity*. 48(4):621-623
- Pennock N, Martinson H, Guo Q, et al. 2018. Ibuprofen supports macrophage differentiation, T cell recruitment, and tumor suppression in a model of postpartum breast cancer. *J Immunother Cancer*. 6(1): 98.
- Shang R, Archibald R, Gelb A, Luke GP. 2018. Sparsity-based photoacoustic image reconstruction with a linear array transducer and direct measurement of the forward model. *J Biomed Opt*. 24(3):1-9
- Shivange G, Urbanek K, Przanowski P, et al. 2018. A Single-Agent Dual-Specificity Targeting of FOLR1 and DR5 as an Effective Strategy for Ovarian Cancer. *Cancer Cell*. 34(2):331-345
- Kay Yeung and Jing Yang. 2017 Epithelial-Mesenchymal Transition in tumor metastasis. *Mol Oncol*. 11(1): 28-39.
- Eckert MA, Santiago-Medina M, Lwin TM, et al. 2017. ADAM12 induction by TWIST1 promotes tumor metastasis via regulation of invadopodia and focal adhesions. *Journal of Cell Science* 130: 2036-2048.
- Lee TJ, Yoo JY, Shu D, et al. 2017. RNA nanoparticle-based targeted therapy for glioblastoma through inhibition of oncogenic miR-21. *Mol Ther* 25(7):1544-1555.
- Zhang Y, Leonard M, Shu Y, et al. 2017. Overcoming tamoxifen resistance of human breast cancer by targeted gene silencing using multifunctional pRNA nanoparticles. *ACS Nano* 11(1):335-346.
- Graziano S, Johnston R, Deng O, et al. 2016. Vitamin D/vitamin D receptor axis regulates DNA repair during oncogene-induced senescence. *Oncogene* 35: doi:10.1038/onc.2016.77.
- Kim JA, Tan Y, Wang X, et al. 2016. Comprehensive functional analysis of the tousel-like kinase 2 frequently amplified in aggressive luminal breast cancers. *Nat Commun* 7:12991.

Relevance to Military Health

Breast cancer is the most common non-skin cancer in women, causing the most cancer-related deaths in women under the age of 40.¹ Female active duty Service members have a 20-40% higher incidence rate of breast cancer than the general public.² The incident rate of breast cancer for active duty women is seven times higher than the average incident rate of 15 other cancer types across all Service members.³ The outcomes of BCRP-funded research will ultimately benefit military Service members, Veterans, military beneficiaries, and the general public.

¹ www.cdc.gov/cancer/dataviz

² Zhu et al. 2009. *Cancer Epidemiol Biomarkers Prev* 18(6): 1740-1745.

³ Lee et al. 2016. *MSMR* 23(7): 23-31.

BCRS Program Funded Awards

FY	PI	Amount	Institution	Log Number	Proposal Title
FY99	Daly	\$283,649	Garvan Institute of Medical Research	BC990035	Identification of Novel Prognostic Indicators for Breast Cancer Through Analysis of the EMS1/Cortactin Signaling Pathway
	Deuel	\$5,000 ¹	Scripps Research Institute	BC990698	Novel Angiogenic Domains: Use in Identifying Unique Transforming and Tumor-Promoting Pathways in Human Breast Cancer
	Heyer	\$111,444	University of California, Davis	BC990034	In Vitro Recombination Activities of the Breast Cancer Predisposition Protein BRCA2
	Musgrove	\$222,652	Garvan Institute of Medical Research	BC990037	Role of Cyclin D1 and p27 in Steroidal Control of Cell Cycle Progression in the Mammary Gland In Vivo
	Shah	\$279,000	University of Arkansas for Medical Sciences	BC990024	Role of a Novel Matrix-Degrading Metalloproteinase in Breast Cancer Invasion
	Wang	\$317,510	Texas A&M University	BC990044	Scanning Microwave-Induced Acoustic Tomography
	White	\$334,094	University of Texas Southwest Medical Center	BC990022	Isolation of Factors that Disrupt Critical Protein/Protein Interactions Within the Telomerase Holoenzyme for Use in Breast Cancer Therapeutics
	Wreschner	\$225,000	Tel Aviv University	BC990013	Analysis of the Secreted Novel Breast Cancer-Associated MUC1/Zs Cytokine
FY00	Adamson	\$578,183	Burnham Institute	BC000975	Cripto: A Target for Breast Cancer Treatment
	Akporiaye	\$454,500	University of Arizona	BC000662	Tumor-Mediated Suppression of Dendritic Cell Vaccines
	Penn	\$296,142	University of Toronto Health Network	BC000651	Exploiting the Novel Repressed Transactivator Assay to Identify Protein Interactors and Peptide Inhibitors of the Myc Oncoprotein
FY01	Cai	\$560,144	Vanderbilt University	BC010713	Genetic Polymorphisms, Mitochondrial DNA Damage, and Breast Cancer Risk
	Carraway	\$427,225	University of California, Davis	BC010296	Identification of a Functional Human Homolog of Drosophila Kek1, an Inhibitor of Breast Tumor Cell Growth
	Chaudhary	\$312,000	University of Texas Southwest Medical Center	BC010310	The Role of Ectodysplasin A (EDA) and Its Receptors in the Pathogenesis of Breast Cancer
	Geahlen	\$425,425	Purdue University	BC010725	Characterization of Syk in Breast Carcinoma Cells
	Rosner	\$454,181	St. Luke's-Roosevelt Hospital Center	BC010710	Autocrine and Paracrine Control of Breast Cancer Growth by Sex Hormone-Binding Globulin

Continued on next two pages.

FY	PI	Amount	Institution	Log Number	Proposal Title
FY02	Dou	\$491,999	Wayne State University	BC020507	Synthetic Beta-Lactam Antibiotics as a Selective Breast Cancer Cell Apoptosis Inducer: Significance in Breast Cancer Prevention and Treatment
	Godwin	\$504,000	Fox Chase Cancer Center	BC020911	The Nuclear Death Domain Protein p84N5, a Candidate Breast Cancer Susceptibility Gene
	Perkins	\$490,500	Yale University	BC021042	Rapid Genomic Approach to Cancer Gene Discovery in Breast Cancer
FY03	Chung	\$490,447	Yale University	BC031926	Quantitative In Situ Assessment of the Somatostatin Receptor in Breast Cancer to Assess Response to Targeted Therapy with 111-in-Pentetreotide
	Kaaks	\$367,639	German Cancer Research Center (DKFZ)	BC030208	Fatty Acid Synthesis Gene Variants and Breast Cancer Risk: A Study Within the European Prospective Investigation into Cancer and Nutrition (EPIC)
	Yaswen	\$508,790	Lawrence Berkeley National Laboratory	BC030545	Functional Analysis of BORIS, a Novel DNA-Binding Protein
	Ziv	\$767,171	University of California, San Francisco	BC030551	Admixture and Breast Cancer Risk Among Latinas
FY04	Bissell	\$386,569	Lawrence Berkeley National Laboratory	BC044087	Use of HA-Metal Nanoparticles to Identify and Characterize Tumorigenic Progenitor Cell Subsets in Breast Tumors
	Clarke	\$588,738	Northern California Cancer Center	BC044177	The Hygiene Hypothesis and Breast Cancer: A Novel Application of an Etiologic Theory for Allergies, Asthma, and Other Immune Disorders
	Giorgio	\$453,000	Vanderbilt University	BC043908	Surface Functionalized Nanoparticles and Nanocrystals for Proximity-Modulated, Early Neoplasia Detection, Imaging, and Treatment of Breast Cancer
	Lemmon	\$475,500	University of Pennsylvania	BC044225	Harnessing Novel Secreted Inhibitors of EGF Receptor Signaling for Breast Cancer Treatment
FY05	Zinn ²	\$436,500	University of Alabama at Birmingham	BC050034	Novel Screening and Precise Localization of Early Stage Breast Cancer in Animal Model
	Huang	\$483,600	Cornell University, Weill Medical College	BC050558	Migrastatin Analogues as Potent Inhibitors of Breast Cancer Metastasis
	Liu	\$448,500	Ohio State University	BC051613	Hunting for Novel X-Linked Breast Cancer Suppressor Genes in Mouse and Human
	Rao	\$468,000	Stanford University	BC050909	Ribozyme-Mediated Imaging of Oncogene Expression in Breast Tumor Cells
FY06	Devi	\$155,085 ³	Duke University Medical Center	BC060434	Modulation of Regulatory T Cells as a Novel Adjuvant for Breast Cancer Immunotherapy
	Lee	\$489,000	University of Southern California	BC060145	A New Mechanism for Estrogen-Starvation Resistance in Breast Cancer
	Li	\$438,455	Baylor College of Medicine	BC060332	The ER/PR Status of the Originating Cell of ER-Negative Breast Cancer
	Mousa	\$377,620	Albany College of Pharmacy	BC061072	Enhancing the Efficacy of Chemotherapeutic Breast Cancer Treatment with Non-Anticoagulant Heparins
	Rastinejad	\$454,500	University of Virginia	BC060108	Structural Characterization of the Interdomain Features of the Estrogen Receptor
FY07	Kuperwasser	\$817,500	Tufts University	BC063332	Mechanisms of Breast Cancer Associated with Obesity
	Kelly	\$244,450 ⁴	University of Virginia	BC063128	Genetically Encoded Targeted, Amplifiable, Imaging Agents for Early Detection of Breast Cancer
	Gerbi	\$155,550 ⁵	Brown University	BC063945	Hormonal Involvement in Breast Cancer Gene Amplification
FY08	Park	\$111,663	North Dakota State University	BC084025	In Utero Exposure to Dietary Methyl Nutrients and Breast Cancer Risk in Offspring
	Radosz	\$528,939	University of Wyoming	BC083821	Breast Cancer-Targeting Nuclear Drug Delivery Overcoming Drug Resistance for Breast Cancer Therapy
	Hill	\$577,500	Oregon Health and Science University	BC084377	Vaccine Vector for Sustained High-Level Antitumor CTL Response
	You	\$503,666	University of Oklahoma Health Science Center	BC084623	Targeted Delivery and Remote-Controlled Release of Chemotherapeutic Agents
	Seagroves	\$166,667 ⁶	University of Tennessee Health Science Center	BC083846	The Role of HIF-1 Alpha in Breast Cancer: A Positive Factor in Cancer Stem Cell Expansion via Notch?

FY	PI	Amount	Institution	Log Number	Proposal Title
FY09	Reynolds	\$730,000 ⁷	Cancer Prevention Institute of California	BC095145	Hazardous Air Pollutants and Breast Cancer: An Unexplored Area of Risk
	Wysolmerski	\$620,626	Yale University	BC095546	Effects of Nuclear Parathyroid Hormone-Related Protein Signaling in Breast Cancer
FY10	Schedin	\$368,125 ⁸	University of Colorado, Denver	BC101904	The Immune Modulatory Program of Post-Partum Involution Promotes Pregnancy-Associated Breast Cancer
	Leung	\$556,875 ⁹	Johns Hopkins University	BC101881	The Role of Poly(ADP-Ribose) in microRNA Activity in Breast Cancers
FY11	Minn	\$399,942	University of Pennsylvania	BC111503	Regulation of Metastasis and DNA Damage Resistance Pathways by Transposable Elements
	Wang	\$409,693	Baylor College of Medicine	BC111902	Copy Number Signature of Recurrent Gene Fusions Reveals Potential Drug Targets in Invasive Breast Cancer
	Hervas	\$58,975 ¹⁰	St. Louis University	BC110089	Stabilization of 53BP1 in Triple-Negative and BRCA-Deficient Breast Tumors: A Novel Therapeutic Strategy
FY12	Yang	\$465,000	University of California, San Diego	BC121670	Regulation of Breast Cancer Stem Cell by Tissue Rigidity
	Giancotti	\$174,837 ¹¹	Memorial Sloan-Kettering Cancer Center	BC121829	Autophagy and TGF-Beta Antagonist Signaling in Breast Cancer Dormancy at Premetastatic Sites
FY13	Rubin	\$457,075	University of California, Santa Cruz	BC131294	Inhibition of Retinoblastoma Protein Inhibition
	Luke	\$96,992 ¹²	Dartmouth College	BC133216	Noninvasive Label-Free Detection of Micrometastases in the Lymphatics with Ultrasound-Guided Photoacoustic Imaging
FY14	Shu	\$364,343	Ohio State University	BC140428	Ultrastable Nontoxic RNA Nanoparticles for Targeting Triple-Negative Breast Cancer Stem Cells
	Ellisen	\$93,050 ¹³	Massachusetts General Hospital	BC140903	Defining High-Risk Precursor Signaling to Advance Breast Cancer Risk Assessment and Prevention
	Brown	\$7,457 ¹⁴	University of Rochester	BC140798	Prediction of Metastasis Using Second Harmonic Generation
	DeNardo	\$7,061 ¹⁵	Washington University	BC141770	Reprogramming the Metastatic Microenvironment to Combat Disease Recurrence
FY15	Bonfil	\$254,765 ¹⁶	Wayne State University	BC150621	Discoidin Domain Receptors: Novel Targets in Breast Cancer Bone Metastasis
	Maki	\$254,765 ¹⁷	Rush University Medical Center	BC150340	Targeting Prolyl Peptidases in Triple-Negative Breast Cancer
FY16	Mani	\$174,992 ¹⁸	Albert Einstein College of Medicine	BC161093	Inhibition of Microbial Beta-Glucuronidase as a Strategy Toward Breast Cancer Chemoprevention
	Lelievre	\$353,879 ¹⁹	Purdue University	BC161889	Risk-on-a-Chip for Tailored Primary Prevention of Breast Cancers
FY17	Jogender Tushir-Singh	\$282,378 ²⁰	University of Virginia	BC170197	A Highly Superior and Selective Cancer Immunotherapy-Based Approach for Triple-Negative Breast Cancers
	Pradeep Chaluvally-Raghavan	\$282,378 ²¹	Medical College of Wisconsin	BC170885	Targeting miR551b to Prevent Tumor Formation and Metastasis of Triple-Negative Breast Cancer
FY18	David Potter	\$263,717 ²²	University of Minnesota, Twin Cities	BC180596	Potential of Immune Checkpoint Blockade by Inhibition of Epoxyeicosatrienoic Acid-Driven Tumor Respiration
	Abhishek Sharma	\$263,716 ²³	Stevens Institute of Technology	BC180833	A Novel Class of Antagonists for Robust Inhibition of Mutant Estrogen Receptor Action in Endocrine-Resistant Metastatic Breast Cancer

¹ Total award amount was \$404,176; remaining funds were from the FY99 BCRP.

² The original Principal Investigator, Dr. Tandra Chaudhuri, is deceased.

³ Total award amount was \$461,933; remaining funds were from the FY06 BCRP.

⁴ Total award amount was \$687,397; remaining funds were from the FY06 BCRP.

⁵ Total award amount was \$787,325; remaining funds were from the FY06 and FY07 BCRP.

⁶ Total award amount was \$554,987; remaining funds were from the FY08 BCRP.

⁷ Total award amount was \$860,883; remaining funds were from the FY09 BCRP.

⁸ Total award amount was \$556,028; remaining funds were from the FY10 BCRP.

⁹ Total award amount was \$585,652; remaining funds were from the FY10 BCRP.

¹⁰ Total award amount was \$744,661; remaining funds were from the FY11 BCRP.

¹¹ Total award amount was \$331,449; remaining funds were from the FY12 BCRP.

¹² Total award amount was \$497,288; remaining funds were from the FY13 BCRP.

¹³ Total award amount was \$605,208; remaining funds were from the FY14 BCRP.

¹⁴ Total award amount was \$215,628; remaining funds were from the FY14 BCRP.

¹⁵ Total award amount was \$527,797; remaining funds were from the FY14 BCRP.

¹⁶ Total award amount was \$522,715; remaining funds were from the FY15 BCRP.

¹⁷ Total award amount was \$581,250; remaining funds were from the FY15 BCRP.

¹⁸ Total award amount was \$626,252; remaining funds were from the FY16 BCRP.

¹⁹ Total award amount was \$564,673; remaining funds were from the FY16 BCRP.

²⁰ Total award amount was \$573,784; remaining funds were from the FY17 BCRP.

²¹ Total award amount was \$563,272; remaining funds were from the FY17 BCRP.

²² Total award amount was \$567,344; remaining funds were from the FY18 BCRP.

²³ Total award amount was \$471,719; remaining funds were from the FY18 BCRP.



For more information, visit:

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