I OVERVIEW OF THE CDMRP

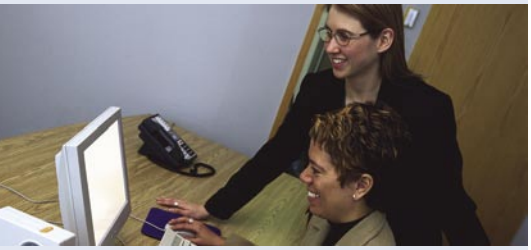
In 1971, President Richard M. Nixon declared a "War on Cancer" and challenged the nation to find a cure. Today, cancer and other diseases continue to exert a phenomenal toll on the American public. It was estimated that in 2005, 9.8 million Americans have had cancer or are living with cancer. Additionally, it was estimated that in 2005, 570,280 Americans would die of cancer, and approximately 1.372 million Americans would be newly diagnosed with one of these diseases.[1] In the past decade, heightened public awareness and increased interest in health issues have influenced scientific research. Cancer research has drawn particular attention, due in part to the rising impact of cancer and the work of highly visible consumer advocacy organizations. In response to these concerns and the national commitment to end the war on cancer, the U.S. Congress directed the Department of Defense (DOD) to manage intramural and extramural research programs that focus on specific diseases. The Congressionally Directed Medical Research Programs (CDMRP), a research directorate within the U.S. Army Medical Research and Materiel Command (USAMRMC),[2] has been responsible for managing targeted appropriations totaling almost $3.4 billion (B) for fiscal year 1992 through fiscal year 2005 (FY92 through FY05) for research on breast, prostate, and ovarian cancers; neurofibromatosis; military health; chronic myelogenous leukemia; tuberous sclerosis complex; and other health concerns.

The CDMRP is continuing to enable the nation to cure diseases. Since its inception, the CDMRP has managed 54 separate research programs that are aimed at improving the health of all Americans.

In FY92, the USAMRMC received a $25 million (M) congressional appropriation for breast cancer research. The following year, Congress appropriated $210M to the DOD for extramural peer-reviewed breast cancer research. Recognizing that breast cancer was outside its core expertise, the Army sought the advice of the National Academy of Sciences (NAS) to effectively manage the FY93 appropriation. In response, the NAS Institute of Medicine (IOM) issued a report entitled *Strategies for Managing the Breast Cancer Research Program: A Report to the U.S. Army Medical Research and Development Command*. The IOM committee made two pivotal recommendations in this report. First, the committee recommended an annual investment strategy to guide allocations of funds that best address the current needs in breast cancer research. Second, the committee recommended a two-tier review strategy consisting of scientific peer review and programmatic review. This two-tier review system was designed to ensure that the research portfolio reflects not only the most meritorious but also the most programmatically relevant science. Both of these recommendations have become cornerstones in the administration of the majority of

[1] *American Cancer Society,* Cancer Facts and Figures, *2005.*

[2] *Known as the U.S. Army Medical Research and Development Command prior to 1995.*



programs managed by the CDMRP. Further descriptions of the annual investment strategy and two-tier review process can be found in this section under Program Execution and Science Management, page I-5.

PROGRAMS MANAGED BY THE CDMRP

The CDMRP is continuing to enable the nation to cure diseases. Since its inception, the CDMRP has managed 54 separate research programs that are aimed at improving the health of all Americans. Congressional appropriations directed toward these 54 research programs total almost $3.4B. Seven of the programs managed by the CDMRP are considered core programs because they either have received or have the potential to receive multiple appropriations and are characterized by standing Integration Panels (IPs) composed of expert scientists, clinicians, and consumer advocates. The other programs managed by the CDMRP are characterized by a one-time appropriation and/or are institutionally based. Although the programs within the CDMRP share many common features, each program is unique and emphasizes the specific needs of its research and advocacy communities. Highlights of each of the seven core programs follow with additional details found in the corresponding program sections. Section XI of this report contains information on the other programs managed by the CDMRP.

Breast Cancer Research Program

The DOD Breast Cancer Research Program's (BCRP's) vision is to eradicate breast cancer. As the second largest funder of extramural breast cancer research in the world, the BCRP has managed approximately $1.83B in appropriations from FY92 through FY05. The program has become a recognized leader in innovative program management. In an effort to fight breast cancer, a research portfolio has been built that encompasses a wide spectrum of projects spanning the prevention, detection, diagnosis, and treatment of breast cancer (Figure I-1). Awards made through this program support innovative ideas, the training of future generations of scientists and clinicians, necessary research resources, and translational research. Through FY04, the BCRP has received over 25,335 proposals and has made 4,293 awards. Additional details regarding the BCRP are included in Section IV.

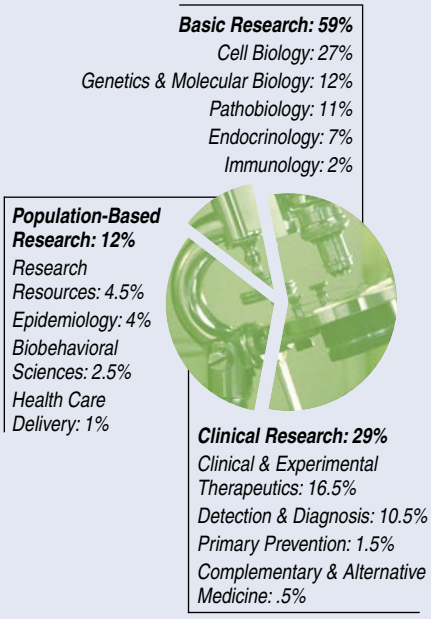


Figure I-1. FY92–04 BCRP Portfolio by Research Area

Prostate Cancer Research Program

The DOD Prostate Cancer Research Program's (PCRP's) vision is to conquer prostate cancer. The PCRP is the second largest funder of extramural prostate cancer research in the United States and has been responsible for the management of $650M in congressional appropriations through FY05. The program has supported basic, clinical, and population-based research directed toward eliminating this life-threatening disease (Figure I-2). In addition, the PCRP remains committed

to addressing the significant disparities in the incidence and mortality rates of prostate cancer that exist among different ethnic groups, and it has designed several award mechanisms to stimulate research in this area. (See the related box story on page II-8 about the PCRP's health disparity initiatives.) Through FY04, this program has received more than 5,100 proposals, leading to 1,245 awards. The PCRP is described in greater detail in Section V.

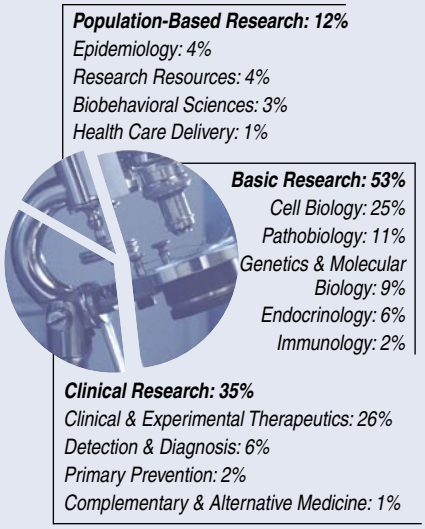


Figure I-2. FY97–04 PCRP Portfolio by Research Area

Neurofibromatosis Research Program

The DOD Neurofibromatosis Research Program's (NFRP's) vision is to decrease the impact of neurofibromatosis (NF) and schwannomatosis. As a leader in NF research funding worldwide, the NFRP has managed $155.3M in congressional appropriations from FY96 through FY05. The NFRP has supported a multidisciplinary portfolio aimed at improving and enhancing the quality of life of persons with NF and schwannomatosis (Figure I-3). In recent years, the program has placed emphasis on funding groundbreaking ideas and translating laboratory research to the clinic. The clinical emphasis of the program includes support for large natural history studies and consortium awards, development and evaluation of preclinical model systems, and funding for clinical trials. From FY96 through FY04, the NFRP received 457 proposals that led to 140 awards. Further details on the NFRP appear in Section VI.

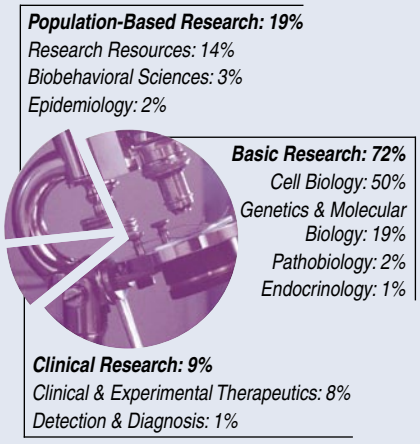


Figure I-3. FY96–04 NFRP Portfolio by Research Area

Ovarian Cancer Research Program

The DOD Ovarian Cancer Research Program's (OCRP's) vision is to eliminate ovarian cancer. The OCRP has built a multidisciplinary portfolio (Figure I-4) that spans basic, clinical, and population-based research as well as research resources. Over the years, the program has offered awards to invigorate the field of ovarian cancer research through the support of collaborations across disciplines and institutions, funding for pioneering research, and the training of new investigators in the ovarian cancer research field. Appropriations for the FY97 through FY05 OCRP total $91.7M. Since the program's inception through FY04, more than 875 proposals have been received; and 92 awards have been made. The OCRP is described in greater detail in Section VII.

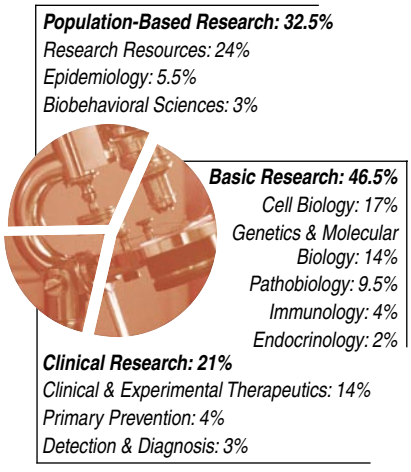


Figure I-4. FY97–04 OCRP Portfolio by Research Area

Peer Reviewed Medical Research Program

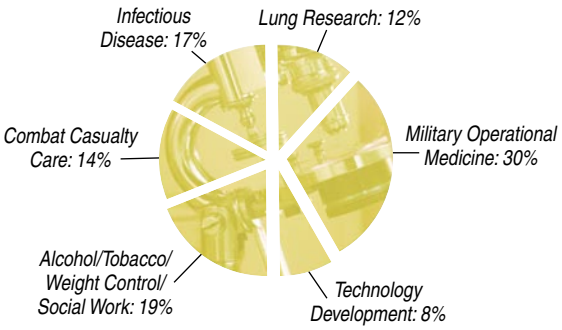


Figure I-5. FY99–04 PRMRP Portfolio by Research Area

The DOD Peer Reviewed Medical Research Program's (PRMRP's) mission is to support research on issues with direct relevance to military health to include family members and veterans. Appropriations for the FY99 through FY05 PRMRP total $294.5M. Through FY04, the PRMRP has developed a portfolio of research that covers 156 medical research projects in 54 topic areas that have direct relevance to military health. Figure I-5 reflects the FY99 through FY04 PRMRP portfolio by research area. An important feature in the execution of this program is the use of an advisory panel, called the Joint Programmatic Review Panel, composed of representatives from the Army, Navy, Air Force, Marines, Department of Veterans Affairs, Office of the Assistant Secretary of Defense (Health Affairs), and U.S. Department of Health and Human Services to develop an investment strategy and conduct programmatic review. Additional features of the PRMRP are detailed in Section VIII.

Chronic Myelogenous Leukemia Research Program

The DOD Chronic Myelogenous Leukemia Research Program's (CMLRP's) vision is to perfect the existing treatments and develop new diagnostic and therapeutic approaches for chronic myelogenous leukemia (CML). The CMLRP was established in FY02 and to date the program has managed $17.75M in congressional appropriations for research in CML. A total of 36 awards have been made through FY04 to improve the understanding, diagnosis, and treatment of CML and enhance the quality of life of persons with the disease. The projects funded by this program encompass basic, clinical, and population-based research (Figure I-6). More detailed information regarding the CMLRP can be found in Section IX.

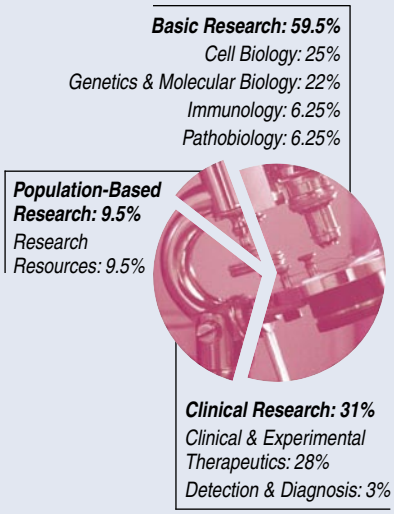


Figure I-6. FY02–04 CMLRP Portfolio by Research Area

Tuberous Sclerosis Complex Research Program

The DOD Tuberous Sclerosis Complex Research Program's (TSCRP's) vision is to lessen the impact of tuberous sclerosis complex. The TSCRP was established by a $1M appropriation in FY02 for tuberous sclerosis complex research, and to date the program has managed $9.2M in congressional appropriations. The TSCRP has funded 20

awards through FY04 in basic, population-based, and clinical research (Figure I-7). The TSCRP is described in more detail in Section X.

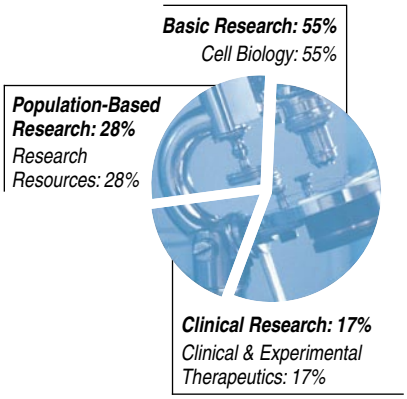


Figure I-7. FY02–04 TSCRP Portfolio by Research Area

PROGRAM EXECUTION AND SCIENCE MANAGEMENT

An important feature of the CDMRP is its ability to adapt to the current needs of the research, clinical, and consumer communities. The CDMRP utilizes a flexible 7-year execution and management cycle that spans all phases of program execution, from the development of a vision through the completion of research grants (Figure I-8). All programs within the CDMRP depend upon yearly, individual congressional appropriations. These funds are not in the President's budget; Congress adds them annually to the DOD appropriation to fund new programs or to continue existing DOD or Army programs. The effectiveness of the programs, the work of consumer advocates, and the need for additional, focused biomedical research have led to continuing appropriations for programs managed by the CDMRP.

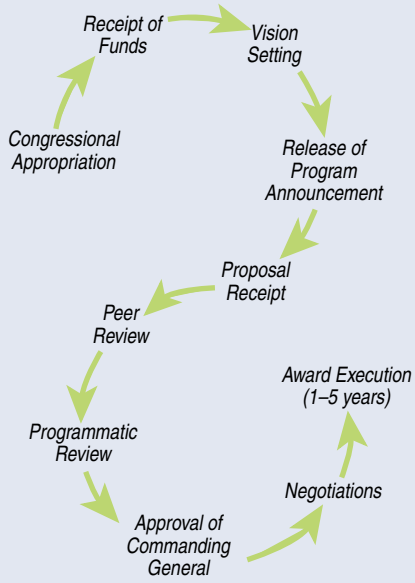


Figure I-8. CDMRP Flexible Execution and Management Cycle

EARLY PROGRAM PLANNING

Early in each FY, after the congressional appropriation has been signed into law, each program's Integration Panel—an expert panel of scientists, clinicians, and consumer advocates—meets to deliberate issues and concerns unique to the individual program and establishes a vision and investment strategy for the coming year. The development of an annual investment strategy stems from the 1993 IOM recommendations[3] and provides a high degree of flexibility. It allows each program to identify underfunded and underrepresented areas of research and to encourage research in those areas that are considered the most critical to patients, consumers, clinicians, and laboratory researchers. The investment strategy provides the framework and direction necessary to most effectively obligate each congressional appropriation, while avoiding unnecessary duplication with other funding agencies. (See Appendices A and B for summaries of congressional appropriations by program and year.)

[3] *Institute of Medicine*, Strategies for Managing the Breast Cancer Research Program: A Report to the U.S. Army Medical Research and Development Command, *The National Academies Press, 1993*.

PROGRAM DEVELOPMENT AND EXECUTION

A critical component of the investment strategy is developing specific award mechanisms that capture the current needs of both the research and advocacy communities. Once an investment strategy is developed, a separate program announcement outlining the award mechanisms offered for each of the research programs managed by the CDMRP is developed in conjunction with each IP and released each FY. The CDMRP has utilized over 30 different types of award mechanisms that fall into three categories: research, training and recruitment, and research resources.[4] See Section II for summary tables of many of the different award mechanisms used by the CDMRP.

Proposals received in response to published announcements are subjected to a two-tier review derived from 1993 IOM recommendations.[5] The two tiers are fundamentally different. The first tier is a scientific peer review of proposals against established criteria for determination of scientific merit. Panels organized by scientific discipline, specialty area, or award mechanism conduct scientific peer review. The primary responsibility of the scientific peer review panels is to provide unbiased, expert advice on the scientific and technical merit of proposals, based upon the review criteria published for each award mechanism. The second tier of the review process is programmatic review. Programmatic review is accomplished by the IP, the advisors who recommend the initial investment strategy. Programmatic review is a comparison-based process in which proposals from multiple research areas compete in a common pool against published review criteria. Scientifically sound proposals that most effectively address the unique focus and goals of the program are then recommended to the Commanding General, USAMRMC, for funding.

GRANTS MANAGEMENT

Awards are made in the form of grants, contracts, or cooperative agreements, and the research is executed over 1 to 5 years, depending on the type of award mechanism. With 6,193 awards made through FY04, the management of these grants, contracts, and/or cooperative agreements is a major focus of the CDMRP. As such, the CDMRP makes certain that the research supported by the American public is monitored thoroughly for technical progress and compliance with animal and human use regulations.

[4] *For a summary of many of the award mechanisms offered by the CDMRP between 1993 and 1999, see Appendix A of the DOD CDMRP Annual Report, September 1999.*

[5] *Institute of Medicine*, Strategies for Managing the Breast Cancer Research Program: A Report to the U.S. Army Medical Research and Development Command, *The National Academies Press, 1993*.

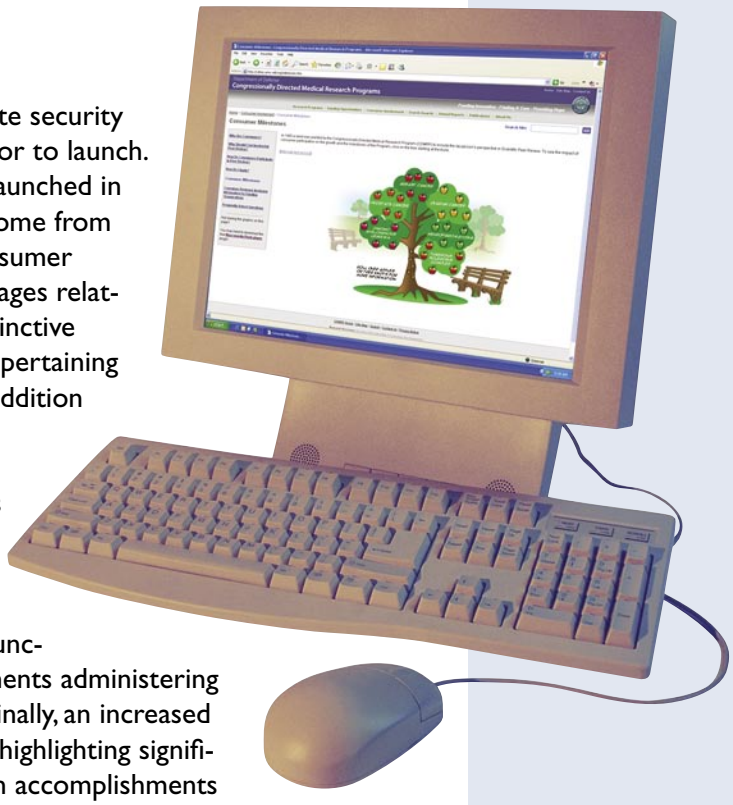
Each CDMRP award is assigned to a Grants Manager for the life of that grant, ensuring a broad knowledge of each grant, continuity among all parties involved in the award, and the most comprehensive assistance possible to the Principal Investigator (PI). The Grants Manager is a doctorate-level scientist or clinician and is the primary technical representative for the management of the award. During the pre-award process, the Grants Managers assess overlap with other funding agencies, ensure the completeness of the required regulatory documents, and serve as liaisons between PIs and representatives at the USAMRMC. During the life of the award, Grants Managers monitor the technical progress of the overall grant, facilitate the resolution of changes or issues, and maintain regular communication with each PI. At the end of the award period, grant files are closed out. Program evaluation commences during the grants management period and continues after closeout.

PROGRAM EVALUATION

The CDMRP's program evaluation division was established to ensure that the CDMRP is finding and funding the best research to eradicate diseases. The impetus for assessing the organization's processes and achievements was multifactorial. First, in late 1995, the USAMRMC commissioned the IOM to review the progress of the BCRP. The IOM was asked to include a review of the portfolio of funded research, assess program management and achievements, and recommend areas for funding that have not been funded or areas that need additional emphasis. The result of this review was a report published in 1997[6] that concluded with 3 major and 13 secondary recommendations. One of the major recommendations was that the CDMRP "develop and implement a plan with benchmarks and appropriate tools to measure achievements and progress toward goals of the BCRP both annually and over time." Secondly, the CDMRP is accountable for the expenditure of congressional appropriations—accountable to the consumer advocacy groups, to the scientific community, to Congress, and to the American public at large. Within this context, the CDMRP developed an integrated approach to the evaluation of its programs and processes and established a program evaluation division to specifically assess research relevance, productivity, and accomplishments. Combined with the activities of the grants management division (detailed earlier), these efforts have collectively enabled the CDMRP to evaluate program operations and outcomes. The following list highlights some of the efforts of the program evaluation division.

[6] *Institute of Medicine*, A Review of the Department of Defense's Program for Breast Cancer Research, *The National Academies Press, 1997*.

- *The development and launch of a new electronic taxonomy coding system for capturing tangible products of funded research for the entire CDMRP portfolio*. This innovative system identifies outcomes of CDMRP research and helps evaluate the return on our investment. The system is currently being used to catalog and track research advances attributed to CDMRP investigators. (See Section III for highlights of some of the products such as drugs, research tools, and instrumentation and diagnosis aids that the CDMRP has helped support.) In addition, the new taxonomy coding system is allowing our staff to better assist researchers with their grants and clinical protocols. Ultimately, such improvements in grants and information management will lead to further advances in disease prevention, treatment, and management.
- *The development and launch of an electronic survey for BCRP Concept Award recipients*. The BCRP launched the Concept Award mechanism in FY99 to fund an initial concept or theory that could give rise to a testable hypothesis. These awards were designed to encourage the exploration of untested, innovative questions in breast cancer. The program evaluation division designed a survey to assess the extent to which the research funded by BCRP Concept Awards provided the foundation for subsequent research funding. Surprisingly, findings indicate that almost two-thirds of Concept Awardees used findings from their BCRP Concept Awards in subsequent research applications and two-thirds of the applications including Concept Award findings received funding. In the vast majority of cases, the research in applications that included Concept Award findings addressed breast cancer, although other cancers were addressed in some applications. Thus, the BCRP's investment in high-risk, high-gain research is paying off.
- *An evaluation of the CDMRP website to measure user effectiveness, efficiency, and satisfaction*. Beginning in the summer of 2004, a group of CDMRP scientists and programmers began meeting to redesign the website. The goals were to make the site more dynamic, more interactive, and more in depth and to address several findings from the Customer Satisfaction Survey finished earlier that same year. (The Customer Satisfaction Survey was profiled in the 2004 CDMRP Annual Report as a program evaluation initiative.) Initial heuristic evaluation of the site revealed findings that were used to make improvements. Scenarios were then devised using proxy customers for each of the identified user groups. Data from the usability testing were utilized in redesigning the website. Following an initial redesign, different subgroups were identified to review specific pages as they were developed. In all, over 200 pages were developed and reviewed. Testing of the site and reviews for compliance with the Americans with Disabilities Act and the Army's



Regulations as well as appropriate security procedures were completed prior to launch. The new website was officially launched in February 2005. A notable outcome from the redesign is emphasis on consumer advocates, including eight new pages relating to survivor involvement, distinctive graphics accompanying the text pertaining to consumer participation, the addition of human interest stories about our survivors called "Consumer Profiles," and research highlights written expressly for consumer advocates. Moreover, new graphics to better depict the CDMRP funding cycle and functions of different DOD departments administering the CDMRP were developed. Finally, an increased importance has been placed on highlighting significant CDMRP-supported reseach accomplishments under the headings "What's New" and "Research Highlights."

RESEARCH INFORMATION DISSEMINATION

The CDMRP continues to recognize the importance of communication and dissemination of program information to its multiple stakeholders, including Congress, consumer advocates, DOD, scientists and clinicians, and the public at large. The CDMRP has supported several efforts to foster program awareness, as follows.

http://cdmrp.army.mil

The CDMRP website disseminates up-to-date program information to the public and the research community. In 2005, the CDMRP website was redesigned to be more dynamic, interactive, in depth, and user friendly. (Read about the efforts to redesign the website in the preceding section entitled "Program Evaluation.") Notably, visitors to the CDMRP website are spending almost 40% more time on the site in 2005 compared to 2004 (time frame compared was February 14–July 31). Features of the newly redesigned site include the following:

- Research Programs—individual programs managed by the CDMRP
- About Us—summary information about the CDMRP
- Funding Opportunities—calls to the scientific and clinical communities to submit proposals under individual award mechanisms offered by research programs

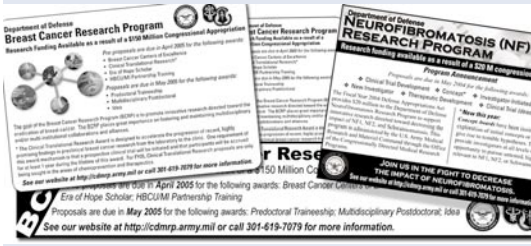
- Consumer Participation—information on consumer involvement in scientific peer review
- Publications—documents such as press releases, annual reports, fact sheets, and program award books
- Search Awards—search engines for posted awards that search by various criteria (including research program, FY, PI, institution, research topic, award mechanism, and clinical trial); the award amount, an abstract, and resulting publications are provided for each award
- Resources & Links—links to other sites
- What's New—the most recent CDMRP happenings, including CDMRP-supported meetings, scientific accomplishments achieved by CDMRP-funded investigators, and press releases

Advertisement of Funding Opportunities and Award Information

Programs within the CDMRP prepare and issue program announcements that provide details on individual award mechanisms, the application process, and requirements for submitting proposals. Once proposals have been funded, the CDMRP promotes public awareness of funded awards. The following publicity efforts are directed toward alerting the scientific research community when new program announcements are released and propagating the word on funded awards:

- Posting the program announcements on the CDMRP website to enable immediate access
- Posting award information on the CDMRP website and encouraging recipient institutions to use both internal and external communications to do the same—this effort has resulted in over 750 Internet sites publicizing information about the CDMRP
- Notifying websites that specialize in biomedical grant notification, including Community of Science, Science: Grants Net, and ASTRO Awards Monitor
- Alerting over 800 research administrators of upcoming award opportunities with pre-announcements and release date announcements
- Notifying over 50 professional associations (e.g., the American Association of Cancer Research [AACR] and the American Society of Clinical Oncology [ASCO]), 10 military research laboratories, 6 federal agencies, and over 150 consumer advocacy organizations of upcoming funding opportunities

- Advertising both in broadly focused professional journals (e.g., *Science*) and on federal business websites (e.g., E-Grants.gov)
- Utilizing targeted e-mails and advertising (e.g., *New York Times*, *Wall Street Journal, TR100 Technology Reviews* [list of 100 top innovators under 35 years of age], and Howard Hughes Medical Institute investigators) for mechanisms that are aimed toward recruiting new applicants or scientists in specific research areas
- Sending e-mails to prior applicants, scientific peer reviewers, and individuals who have requested that their names be placed on the CDMRP notification list
- Sending press releases to cancer research news outlets such as *The Scientist, Oncology Times, BioWorld, SmallTimes*, Yahoo Science, and *The Cancer Letter*
- Distributing CDMRP electronic news items, including congressional appropriations, upcoming funding opportunities, research highlights, and the CDMRP Annual Report to over 200 consumer advocacy groups (such as the National Breast Cancer Coalition, US TOO International, Inc., and Childrens Tumor Foundation)
- Exhibiting the CDMRP display at national scientific meetings such as the AACR and ASCO; at military conferences such as the Association of the United States Army; and at minority research institutions and various symposiums including the Hispanic Association of Colleges & Universities, National Medical Association, DOD HBCU/MI Technical Assistance Workshops, Native American Circle of Hope, Weekend of Hope, and Ovarian Cancer National Alliance Annual Meeting
- Sponsoring accomplished BCRP awardees to attend and present their CDMRP research achievements at the Era of Hope meetings. For example, at the Era of Hope 2005, over 1,200 BCRP grantees attended and highlighted their scientific progress (Refer to the box story on page IV-5 for additional details about the Era of Hope 2005.)



Publications

Approximately 11,680 publications have resulted from investigators who received CDMRP awards through FY03. Citations for these publications are provided to the CDMRP by award recipients. In addition, the CDMRP staff has published articles and presented information at national scientific meetings. A list of the recent CDMRP peer reviewed articles, abstracts, and posters can be found on the CDMRP website at http://cdmrp.army.mil/pubs.

The following examples represent some of the most notable publications stemming from CDMRP-supported investigators.

BCRP

Radisky DC, Levy DD, Littlepage LE, et al. 2005. Rac1b and reactive oxygen species mediate MMP-3-induced EMT and genomic instability. *Nature* 43617:123–127.

Ma XJ, Wang Z, Ryan PD, et al. 2004. A two-gene expression ratio predicts clinical outcome in breast cancer patients treated with tamoxifen. *Cancer Cell* 5:607–616.

Mehrotra J, Ganpat MM, Kaan Y, et al. 2004. ER/PR-negative breast cancers of young African American women have a higher frequency of methylation of multiple genes than those of Caucasian women. *Clin Cancer Res* 10:2052–2057.

Emberley ED, Niu Y, Njue C, et al. 2003. Psoriasin (S100A7) expression is associated with poor outcome in estrogen receptor-negative invasive breast cancer. *Clin Cancer Res* 9:2627–2631.

Liu W, Chen Y, Wang W, et al. 2003. Combination of radiation and celebrex (celecoxib) reduce mammary and lung tumor growth. *Am J Clin Oncol* 26:S103–S109.

PCRP

Christiansen JJ, Rajasekaran S, Chung L, et al. 2005. N-glycosylation and microtubule integrity are involved in apical targeting of prostate-specific membrane antigen: Implications for immunotherapy. *Mol Cancer Ther* 4(5):704–714.

Gududuru V, Hurh E, Dalton JT, et al. 2005. Discovery of 2-arylthiazolidine-4-carboxylic acid amides as a new class of cytotoxic agents for prostate cancer. *J Med Chem* 48:2584–2588.

Narla G, DiFeo A, Reeves HL, et al. 2005. A germ line DNA polymorphism enhances alternative splicing of the KLF6 tumor suppressor gene and is associated with increased prostate cancer risk. *Cancer Res* 65:1213–1222.

Tomlins SA, Rhodes DR, Perner S, et al. 2005. Recurrent fusion of TMPRSS2 and ETS transcription factor genes in prostate cancer. *Science* 310(5748):644–648.

Wang X, Yu J, Sreekumar A, et al. 2005. Antibody signatures in prostate cancer. *N Eng J Med* 353(12):1224–1235.

Fei B, Lee Z, Boll DT, et al. 2004. Registration and fusion of SPECT, high resolution MRI and interventional MRI for thermal ablation of prostate cancer. *IEEE Transductions Nucl Sci* 51:177–183.

NFRP

Dasgupta B, Li W, Perry A, et al. 2005. Glioma formation in neurofibromatosis 1 reflects preferential activation of K-RAS in astrocytes. *Cancer Res* 65:236–245.

Costa RM, Yang T, Huynh DP, et al. 2001. Learning deficits, but normal development and tumor predisposition, in mice lacking exon 23a of Nf1. *Nat Genetics* 27:399–405.

Zhu Y, Romero MI, Ghosh P, et al. 2001. Ablation of NF1 function in neurons induces abnormal development of cerebral cortex and reactive gliosis in the brain. *Genes Dev* 15: 859–876.

OCRP

Cheng W, Liu J, Yoshida H, et al. 2005. Lineage infidelity of epithelial ovarian cancer is controlled by HOX genes that specify regional identity in the reproductive tract. *Nat Med* 11:531–537.

Chodankar R, Kwang S, Sangiorgi F, et al. 2005. Cell-nonautonomous induction of ovarian and uterine serous cystadenomas in mice lacking a functional Brca1 in ovarian granulosa cells. *Curr Biol* 15(6):561–565.

Subramanian IV, Ghebre R, and Ramakrishnan S. 2005. Adeno-associated virus-mediated delivery of a mutant endostatin suppresses ovarian carcinoma growth in mice. *Gene Ther* 12:30–38.

Curiel TJ, Cheng P, Mottram P, et al. 2004. Dendritic cell subsets differentially regulate angiogenesis in human ovarian cancer. *Cancer Res* 64:5535–5538.

PRMRP

Bertolotti-Ciarlet A, Smith J, Strecker K, et al. 2005. Cellular localization and antigenic characterization of Crimean-Congo hemorrhagic fever virus glycoproteins. *J Virol* 79:6152–6161.

Guiseppi-Elie A, Brahim S, Slaughter G, et al. 2005. Design of a subcutaneous implantable biochip for monitoring of glucose and lactate. *IEEE Sensors J* 5:345–355.

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CMLRP

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