

CONGRESSIONALLY DIRECTED  
MEDICAL RESEARCH PROGRAMS:  
PARTNERING FOR A CURE

# III. Prostate Cancer Research Program



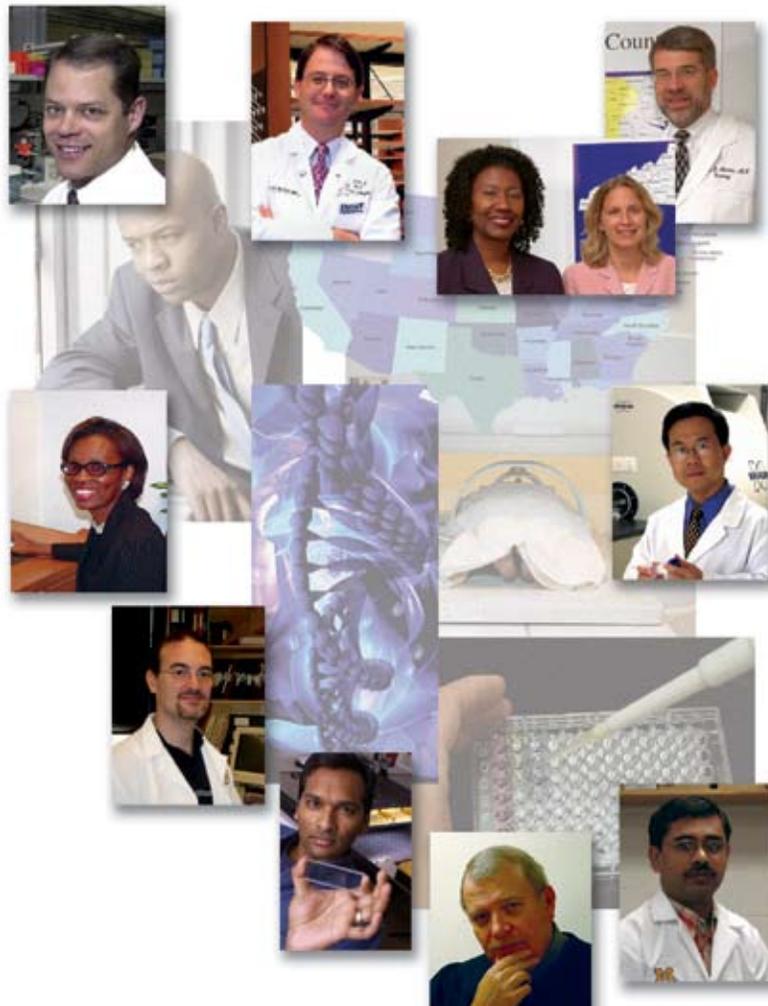


## Vision

To conquer prostate cancer.

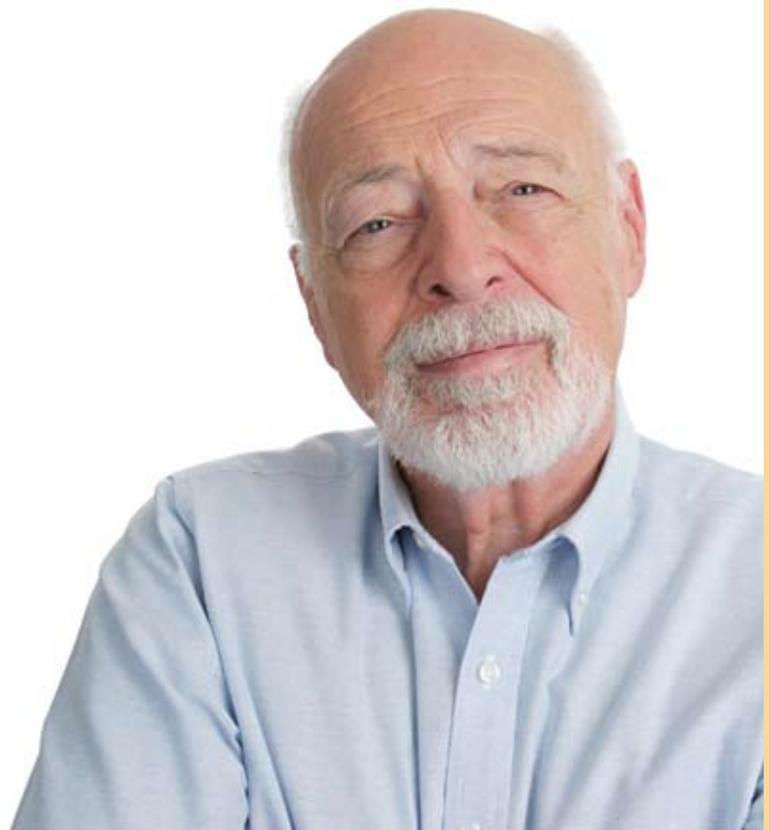
## Mission

To promote innovative and multidisciplinary research directed toward eliminating prostate cancer.



## The Disease

Prostate cancer is the most commonly diagnosed cancer in men. 🌸 Prostate cancer is second only to lung cancer as a leading cause of cancer deaths in men. 🌸 In 2006, approximately **234,460** men in the United States will be diagnosed with prostate cancer, and an estimated **27,350** will die from the disease. 🌸 Prostate cancer incidence rates remain significantly higher in African American men compared to Caucasian men, and the death rate for African American men remains more than twice that of Caucasian men.<sup>1</sup> 🌸 Currently, there is no cure for locally advanced or metastatic prostate cancer.



<sup>1</sup> American Cancer Society, *Cancer Facts and Figures*, 2006.



## Signs and Symptoms

Signs and symptoms do not typically accompany early cases of prostate cancer. However, some indicators of more advanced prostate cancer include:

- ❖ Frequent urination, especially at night
- ❖ Weak or interrupted urine flow
- ❖ Inability to urinate or difficulty starting or stopping the urine flow
- ❖ Painful or burning sensation when urinating
- ❖ Blood in the urine
- ❖ Continual pain in the lower back, pelvis, or upper thighs

Many of these symptoms are nonspecific and are not always related to a serious condition.<sup>2</sup>



<sup>2</sup> American Cancer Society, *Cancer Facts and Figures*, 2006.

## Program Background

The Department of Defense (DOD) Prostate Cancer Research Program (PCRP) was established in fiscal year 1997 (FY97) by Appropriations Conference Committee Report No. 104-863, which provided \$45 million (M) for research in prostate cancer. FY07 marks the 10th anniversary of the PCRP, and touching the lives of those affected by prostate cancer has captured the spirit of the PCRP since its inception. Whether the program is funding clinical trials, sponsoring clinical consortia, supporting innovative basic research, or training physician scientists, the PCRP is committed to supporting high-risk, high-gain research with the potential to translate into the clinic where it will benefit patients. The PCRP is the second leading source of extramural prostate cancer research funding in the United States, managing \$730M in peer-reviewed prostate cancer research from FY97 to FY06. A total of 1,454 awards have been made through FY05 aimed at preventing, detecting, treating, and improving the quality of life of those afflicted with the disease. See Figure III-1 for a snapshot of the program's history.

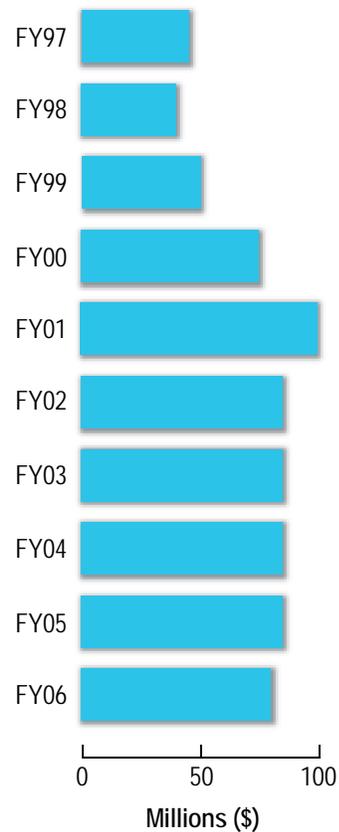


Figure III-1. PCRP Funding History



## The Program Today

### Fiscal Year 2005 Summary

Fiscal Year **2005**  
**1,055** Proposals Received  
**\$85M** in Appropriations  
**209** Awards

Congress appropriated \$85M in FY05 to continue the peer-reviewed DOD PCRP. The emphasis for the FY05 program was placed on innovation, training, and translational and clinical research. Table III-1 provides a summary of the FY05 PCRP award categories and mechanisms in terms of number of proposals received, number of awards made, and dollars invested. As illustrated in Figure III-2, the FY05 PCRP has developed a diverse research portfolio that encompasses basic, clinical, and population-based research.

Table III-1. Funding Summary for the FY05 PCRP

| Categories and Award Mechanisms   | Proposals Received | Awards     | Investment          |
|---|--------------------|------------|---------------------|
| <b>Clinical Research</b>  |                    |            |                     |
| Clinical Trial  | 28                 | 5          | \$4,007,690         |
| Clinical Trial Development  | 19                 | 1          | \$99,038            |
| <b>Innovative Research</b>  |                    |            |                     |
| Exploration-Hypothesis Development  | 178                | 22         | \$2,485,666         |
| Health Disparity Research-Prostate Scholar  | 11                 | 2          | \$824,046           |
| Idea Development (with optional Nested Resident and Medical Student Traineeships) | 438                | 60         | \$34,657,301        |
| New Investigator  | 129                | 25         | \$8,477,197         |
| <b>Training/Recruitment</b>   |                    |            |                     |
| HBCU* Undergraduate Collaborative Summer Training Program                         | 8                  | 5          | \$940,839           |
| Health Disparity Training-Prostate Scholar  | 7                  | 3          | \$475,000           |
| Physician Research Training   | 20                 | 6          | \$3,542,959         |
| Postdoctoral Traineeship  | 132                | 41         | \$5,090,025         |
| Predocctoral Traineeship  | 72                 | 30         | \$2,969,567         |
| <b>Research Resources</b>   |                    |            |                     |
| Clinical Consortium   | 13                 | 9          | \$11,318,426        |
| <b>Supplements to Prior Year Awards</b>   |                    |            |                     |
|   | N/A                | N/A        | \$2,052,775         |
| <b>TOTAL</b>  | <b>1,055</b>       | <b>209</b> | <b>\$76,940,529</b> |

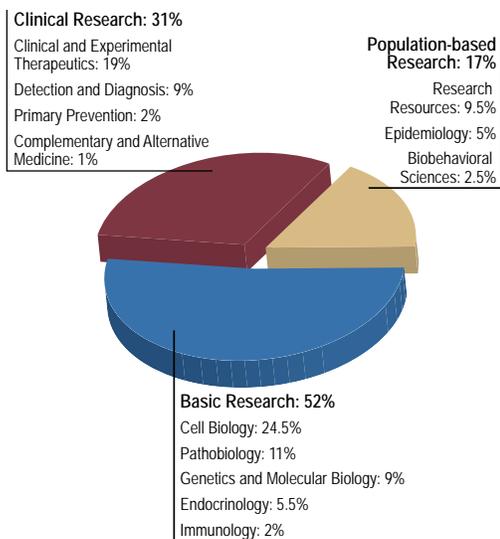


Figure III-2. FY05 PCRP Portfolio by Research Area

\* Historically Black Colleges and Universities

## Fiscal Year 2006 Summary

Congress appropriated \$80M to continue the PCRP in FY06. Eleven award mechanisms were offered to sustain the PCRP's investment in innovation, training, and translational and clinical research. Ten of these award mechanisms were established previously by the PCRP. A modified mechanism also debuted in FY06 that was called the Prostate Cancer Training Award (PCTA). The PCTA consolidated research training opportunities for talented predoctoral students, postdoctoral researchers, medical students, residents, and fellows into one mechanism. Enthusiasm for the program has intensified among researchers, as the number of proposals received nearly doubled that of the inaugural year totaling 1,176 across the 11 award mechanisms, as shown in Figure III-3. Approximately 200 awards are expected. Appendix B, Table B-2, summarizes the congressional appropriations and the investment strategy executed by the PCRP for FY05 and FY06.

Fiscal Year **2006**  
**1,176** Proposals Received  
**\$80M** in Appropriations  
**~200** Awards

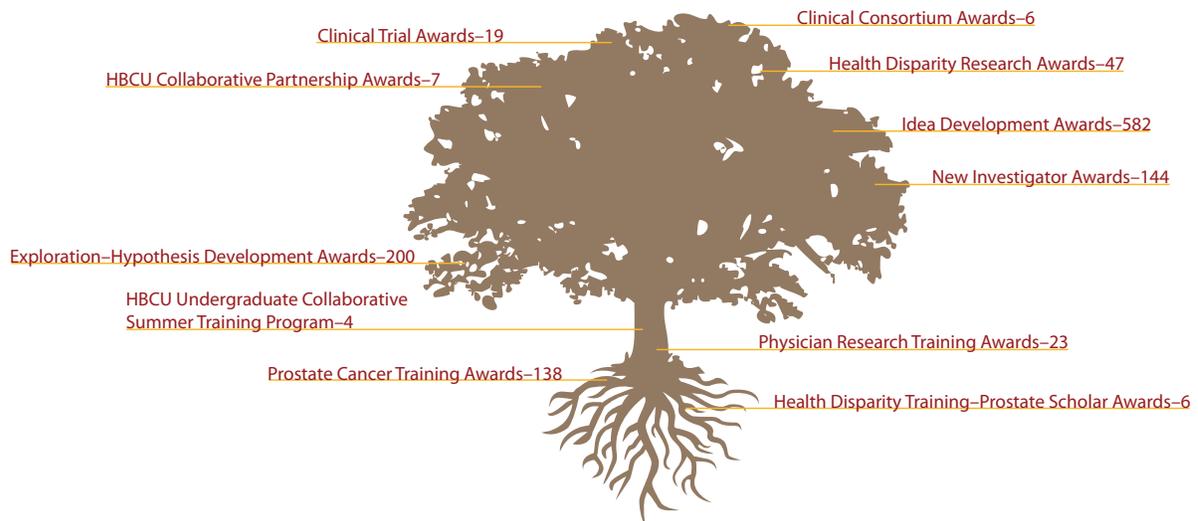
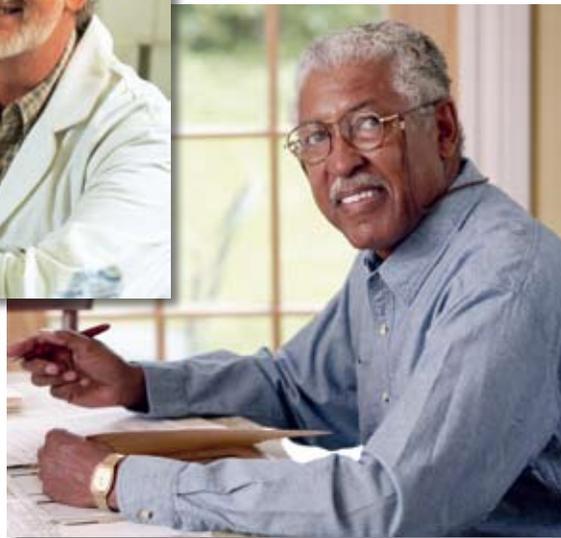


Figure III-3. Award Mechanisms Offered and Proposals Received for the FY06 PCRP



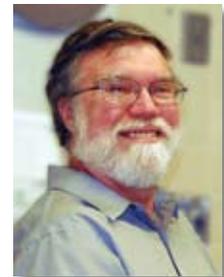
## A Team of Outstanding People

The PCRP recognizes that research excellence requires broad and visionary insight from the entire prostate cancer community—from scientists, to research managers, to those ultimately affected by the disease. The combined efforts of the best people are making a difference in the fight against prostate cancer.



## Consumer Advocate Participation

Consumer advocates actively participate in setting program priorities and making funding decisions. More than **150** consumer advocates have served on peer and programmatic review panels for the PCRP. Their firsthand experiences with prostate cancer provide a unique perspective that helps scientists understand the human side of the disease and allow for funding decisions that reflect the concerns and needs of patients, their families, and clinicians. Consumer advocates also share what they have learned with their communities, resulting in increased awareness of the importance of research and a stronger relationship between the scientific and consumer advocate communities. More information about consumer advocate participation can be found in Chapter I.



*DR. DON SENS, UNIVERSITY OF NORTH DAKOTA  
SCHOOL OF MEDICINE AND HEALTH SCIENCES  
FY97–FY06 SCIENTIFIC PEER REVIEWER*

“I always enjoy the scientific interactions with the consumers and the insights into their experiences with research and treatment. I also use the consumers as the motivation for my own, my wife’s, and my friends yearly doctor’s appointments. I get my own physical and prostate exam when I return from the PC panel and I bug my wife about the mammogram when I return from the BC panel. I go home, I bug people to get checkups. So you also save lives. Maybe mine.”



*MR. CHARLES (CHUCK) MAACK  
WICHITA, KANSAS CHAPTER, US TOO INTL., INC.  
FY06 PCRP CONSUMER PEER REVIEWER*

"A consumer reviewer in the Congressionally Directed Medical Research Programs participating with scientists with expertise in prostate cancer research was one of the most educational experiences in my over 13 years as a prostate cancer survivor patient who has dedicated my retirement years in advocacy to prostate cancer awareness, research, and patient education and empowerment. The panel I was assigned was charged with reviewing and evaluating research proposals regarding cell biology. Both scientists and consumer reviewers exchanged frank appraisals recognizing the observations of each other in discussing the merits of each proposal and the reasoning behind each member's comments. I was particularly impressed with the professionalism of all present, the importance of the CDMRP, and the exceptional research that is being conducted to ultimately eradicate prostate cancer."

*THE HONORABLE RALPH M. BURNETT  
NATIONAL PROSTATE CANCER COALITION  
FY06 PCRP CONSUMER IP MEMBER*



"The DOD's Prostate Cancer Research Program has changed the dynamics and speed of prostate cancer research and helped bring the possibility of meaningful new treatments for prostate cancer closer to reality. The peer review process has cut delay and added real resources to what has been the historically intractable conundrum of cancer. Translational research is no longer just a desire or a vision but has become a reality which will soon be helping patients at the bedside. I believe strongly that because of DOD's successes that death and morbidity from prostate cancer will shortly become a thing of the past. I am proud to have been a part of this medical-changing history."

## Integration Panel

The PCRCP Integration Panel (IP) is composed of exceptional scientists, clinicians, and consumer advocates who use their expertise to create effective investment strategies, craft innovative research agendas, and develop broad-based research portfolios (for more information about the functions of the IP, see Chapter I). The active input of the IP enables the PCRCP to find and fund the best research and set important program priorities aimed at eliminating prostate cancer.

### Fiscal Year 2006 IP Members

*JEAN DEKERNION, M.D. (CHAIR), DAVID GEFLEN SCHOOL OF MEDICINE AT THE UNIVERSITY OF CALIFORNIA, LOS ANGELES*

*ROBERT DREICER, M.D. (CHAIR EMERITUS), THE CLEVELAND CLINIC FOUNDATION*

*TIMOTHY RATLIFF, PH.D. (CHAIR-ELECT), UNIVERSITY OF IOWA*

*GAIL PRINS, PH.D. (MEMBER-AT-LARGE), UNIVERSITY OF ILLINOIS AT CHICAGO*

*VIRGIL SIMONS (MEMBER-AT-LARGE), THE PROSTATE NET*

*THE HONORABLE RALPH BURNETT, NATIONAL PROSTATE CANCER COALITION*

*THOMAS CAREY, PH.D., UNIVERSITY OF MICHIGAN COMPREHENSIVE CANCER CENTER*

*PETER CHOYKE, M.D., NATIONAL CANCER INSTITUTE*

*ANGELO DEMARZO, M.D., PH.D., JOHNS HOPKINS MEDICAL INSTITUTIONS*

*DONALD MILLER, M.D., PH.D., JAMES GRAHAM BROWN CANCER CENTER, UNIVERSITY OF LOUISVILLE*

*A. OLIVER SARTOR, M.D., DANA-FARBER CANCER INSTITUTE*

*HOWARD SOULE, PH.D., KNOWLEDGE UNIVERSE HEALTH AND WELLNESS GROUP*



## The Scientific Community

Whether supporting early-career scientists or established prostate cancer experts, the PCRCP has funded more than **1,450** researchers in the war against prostate cancer. The PCRCP's multifaceted investment strategy is designed to touch lives with innovative basic research and clinically oriented research that will translate into treatments of the disease. All of the researchers funded by the PCRCP are dedicated to improving the lives of those affected by prostate cancer through their discoveries. The remainder of this chapter highlights some of the progress that has been made on the war against prostate cancer.



*JEAN DEKERNION, M.D.  
DAVID GEFFEN SCHOOL OF MEDICINE AT UCLA  
FY06 PCRCP IP CHAIR*

"The Prostate Cancer Research Program of the DOD has played a pivotal part in the war against this common malignancy. The approach of the DOD has been different from that of other funding organizations. Perhaps the greatest strength is the "vision setting" that occurs each year at which time all of the members of the Integration Panel devote a great deal of time and thought to new methods of approaching prostate cancer research. This allows an element of originality and fluidity, which is not found in some other research funding organizations. Most importantly, the PCRCP has been willing to invest in innovative approaches and has given many investigators with bold new ideas an opportunity to enter the field and make important contributions. The group has always seized on new concepts and adjusted its programs to take best advantage of these opportunities. As a result, not only have hundreds of investigators been given a start in research, but also a large number of important new directions in prostate cancer research have been recognized and pursued. It has been a sincere pleasure to be of service to this very special prostate cancer research program."

## Touching Human Lives

The PCRP is committed to fostering investigators and ideas, at the basic, preclinical, and clinical levels, with the greatest potential to positively change the lives of those living with prostate cancer.

This approach ensures that state-of-the-art research matures from the “bench” to the “bedside.”

Basic science research typically begins at the bench with studies into the cellular structures and molecular events that underlie prostate cancer development and progression. This critical information can be used to attack the disease at its weak points and prevent it in healthy men.

The efforts of both individual investigators and basic scientist–clinician partnerships are critical to forging the frontier of prostate cancer research from the bench to the bedside—a progression that is fundamentally necessary for treating and conquering prostate cancer.





## Touching Lives by Eliminating Health Disparity

Since FY98, the PCRCP has emphasized basic, translational, and clinical research on the disparities that exist in risk, incidence, prevalence, and mortality of prostate cancer. In particular, African American men have the highest incidence of prostate cancer of any racial or ethnic group in the United States and are more than twice as likely as Caucasian American men to die from the disease. The underlying causes of disparities in prostate cancer incidence and mortality remain elusive but are likely to involve some combination of socioeconomic, cultural, environmental, and genetic factors. The PCRCP is addressing this important issue by funding research that will



specifically expand the understanding of prostate cancer health disparities and translate this knowledge into preventing and treating the disease in those at greatest risk.

## GENETIC VARIATION AND PROSTATE CANCER RISK IN MEN



Dr. Matthew Freedman is funded by an FY01 Health Disparity Training–Prostate Scholar Award to identify risk factors for prostate cancer in African Americans using genetic-based approaches. While working at the Massachusetts General Hospital, he identified two gene variants of insulin-like growth factor 1 that were associated strongly with prostate cancer risk. Surprisingly, this valuable finding could be extended to all of the ethnic groups tested (African Americans, Native Hawaiians, Japanese, Latinos, and Caucasians). Dr. Freedman, now at the Dana-Farber Cancer Institute, continues to test additional gene markers to identify additional variants. Dr. Freedman's work will lead to more effective screening and treatment strategies for African Americans, who suffer from this disease at a higher frequency than other populations such as Caucasians.

## ERYTHROCYTE CELL SURFACE PROTEIN AND PROSTATE CANCER MORTALITY IN AFRICAN AMERICANS



African American men have a 60 percent greater incidence of prostate cancer than Caucasian men. Incidentally, approximately 70 percent of African Americans and more than 95 percent of Africans in malaria-endemic regions lack a specific protein in their blood. The protein, known as the Duffy antigen/receptor for chemokines (DARC), is part of the biochemical cascade leading to malaria infection. The DARC protein also interacts with chemokines that promote angiogenesis, the sprouting of new structures for tissue or tumor growth. Based on these observations, Dr. Alex Lentsch of the University of Cincinnati College of Medicine hypothesized that a link may exist between the lack of DARC expression on erythrocytes and the greater incidence and mortality of prostate cancer in the African American population. Data acquired by Dr. Lentsch from an FY01 New Investigator Award suggest that the lack of DARC, as occurs in the majority of African Americans, may be a risk factor indicating increased susceptibility to prostate cancer.



## Touching Lives by Discovering Novel Avenues of Investigation

One of the cornerstones of the PCRCP is the development of innovative ideas aimed at preventing, detecting, and treating prostate cancer. The PCRCP New Investigator, Exploration–Hypothesis Development, and Idea Development Awards support the development of groundbreaking and innovative research for prostate cancer. Innovations in prostate cancer research cover many different areas, including breakthroughs in the way cancer risk is assessed, tumor imaging, and novel drug development as highlighted on the next two pages.



## GENE FUSIONS: TRIGGERS FOR DEVELOPING PROSTATE CANCER



Multiple complex molecular events characterize prostate cancer initiation, unregulated growth, and metastasis. Dr. Arul Chinnaiyan of the University of Michigan has focused on identifying novel clinical markers and therapeutic targets.

He discovered that gene fusions play a widespread role in the development of prostate cancer. Gene fusions, which accidentally combine the DNA of two genes, once were considered rare in epithelial cancers. With funding from an FY02 Idea Development Award, Dr. Chinnaiyan's team found recurrent gene fusions between the prostate-specific, androgen-regulated gene and two other genes linked to leukemias in nearly 80 percent of the samples he analyzed. These findings already have significantly improved upon the current understanding of prostate disease progression. They also may provide both a novel biomarker and a therapeutic target to aid in diagnosis and drug discovery.

## NEW BLOOD TEST TO DETECT PROSTATE CANCER



The prostate-specific antigen (PSA) test is plagued by a high rate of false-positive and false-negative results, leading to increased patient anxiety and unnecessary medical procedures. An ideal diagnostic assay would reduce both false-negative and false-positive results. Dr. Arun Sreekumar, an FY02 Postdoctoral Traineeship Awardee, Dr. Xiaojun Wang, and Dr. Rohit Mehra of the University of Michigan have improved upon the PSA test. A panel of biomarkers was identified that offers more accuracy than the conventional PSA test. A set of 22 biomarkers was identified for this novel blood-based test. The panel of biomarkers generated false positives only 12 percent of the time, which is significantly lower than the test used in the clinic. The new biomarker test also identified prostate cancer in samples even when PSA scores fell into an intermediate range. This new prostate cancer assay offers the hope of earlier and more accurate diagnosis.



## NEW IMAGING METHOD PROVIDES A “BEFORE AND AFTER” SNAPSHOT OF THE PROSTATE



FY01 Postdoctoral Traineeship Awardee Dr. Baowei Fei of Case Western Reserve University envisions using imaging to create “before and after” treatment snapshots of the prostate to improve prostate cancer diagnosis and therapy. Dr. Fei’s approach is to integrate structural and anatomical details with real-time, functional data from two or more different imaging techniques. Dr. Fei created novel image registration techniques that combine multiple imaging modalities for early detection and image-guided therapies for prostate cancer. These novel techniques could improve dosage planning for both external beam and brachytherapy treatments of prostate cancer, leading to improved recovery from these treatments and a decreased risk of recurrence.



## Touching Lives by Promoting Team Science

The PCRP has supported the development of multidisciplinary, multi-institutional collaborative groups, or consortia, which take the findings of independent investigators to a higher level. The complexities of prostate cancer require that the expansion of hypotheses put forth by the scientific community be analyzed in great detail to test the validity of these ideas. While hypotheses may focus on a wide variety of subjects ranging from drug development to cancer susceptibility genes, moving critical research forward to the bedside remains a daunting task. This only can be accomplished through the synergy promoted among teams of scientists. The consortia bring together experts with the needed skills to facilitate large studies that will lead the field toward conquering prostate cancer.

### THE NORTH CAROLINA–LOUISIANA PROSTATE CANCER PROJECT



Dr. James Mohler (right), Dr. Jeanette Bensen (middle), and Ms. Diane Baker (left) of the Roswell Park Cancer Institute are leading a multi-institutional effort (including the University of North Carolina and Louisiana State University) through an FY02 Consortium Award to determine why African American men have more than twice the mortality rate from prostate cancer than Caucasian American men. Interestingly, there is also a geographic disparity within the African American

population; African Americans in North Carolina have one of the highest, and African Americans in Louisiana have one of the lowest mortality rates from prostate cancer in the United States. The mortality of Caucasian men from both areas does not differ significantly. This large, comprehensive study will provide evidence on whether health disparities in prostate cancer are due to (1) interaction with the health care system, (2) diet and biology, and/or (3) characteristics of the tumor.

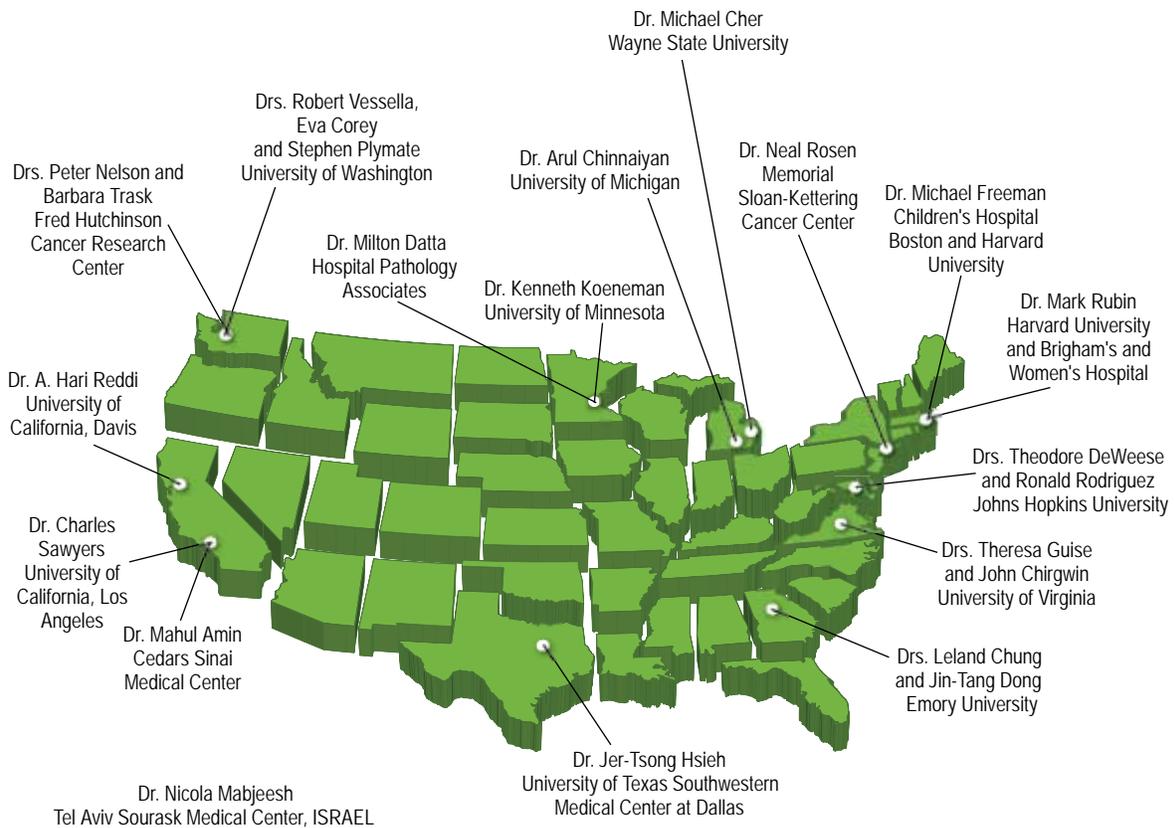


## A SYNERGISTIC CONSORTIUM TARGETING THE LETHAL PHENOTYPES OF PROSTATE CANCER



FY02 Consortium Awardee Dr. Jonathan Simons and project manager Ms. Gaya Chestnut of Emory University are leading a multi-institutional effort to define the lethal phenotype of prostate cancer. Since prostate cancer becomes incurable when it

metastasizes to bone, Dr. Simons' group is focusing on the biology of bone metastasis, an innovative molecular classification system for diagnosis, and new therapeutics. Dr. Simons' group is working with industry to place three new therapeutics into clinical trials. Participating research sites and lead investigators are shown.



## IMPROVING PROSTATE CANCER CARE BY FACILITATING CLINICAL TRIALS

The FY05 Clinical Consortium Award supports the creation of a major multi-institutional clinical trial resource to facilitate rapid execution of novel clinical trials. The goal is to speed the implementation of clinical trials with novel therapeutics that ultimately will decrease the impact of the disease. Dr. Howard Scher of Memorial Sloan-Kettering Cancer Center is leading this multi-institutional consortium.

Participating clinical sites and lead investigators are:

- ❖ Dr. Tomasz Beer, Oregon Health and Science University
- ❖ Dr. Michael Carducci, Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins University
- ❖ Dr. Maha Hussain, University of Michigan Comprehensive Cancer Center
- ❖ Dr. Philip Kantoff, Dana-Farber Cancer Institute
- ❖ Dr. Paul Matthews, The University of Texas M.D. Anderson Cancer Center
- ❖ Dr. Eric Small, University of California, San Francisco Comprehensive Cancer Center
- ❖ Dr. George Wilding, University of Wisconsin, Comprehensive Cancer Center

## BUILDING COLLABORATIONS TO ELIMINATE PROSTATE CANCER DISPARITIES

The Historically Black Colleges and Universities (HBCU) Collaborative Partnership Award seeks to advance research on prostate cancer disparities in affected populations by increasing the number of HBCU scientists trained as prostate cancer investigators and enhancing the research and training infrastructure at the HBCU. This award supports the establishment of long-term, highly interactive partnerships, encompassing both training and research components, between the HBCU and collaborating institutions with established prostate cancer research programs. Dr. Folakemi Odedina of the Florida Agricultural and Mechanical University (FAMU) and Dr. Nagalakshmi B. Kumar of the H. Lee Moffitt Cancer Center and Research Institute (MCC) have formed such a collaboration. The goal of this FY03 HBCU Collaborative Partnership Award is for FAMU to create "The FAMU Minority Prostate Cancer Training and Research Center." The partnership between Dr. Odedina's team and the MCC will result in the training of scientists that can conduct prostate cancer research independently. Initiatives to develop community outreach and education programs also have been highly successful. Products include kiosks in drug stores, consumer forums, online training modules, and television programs.

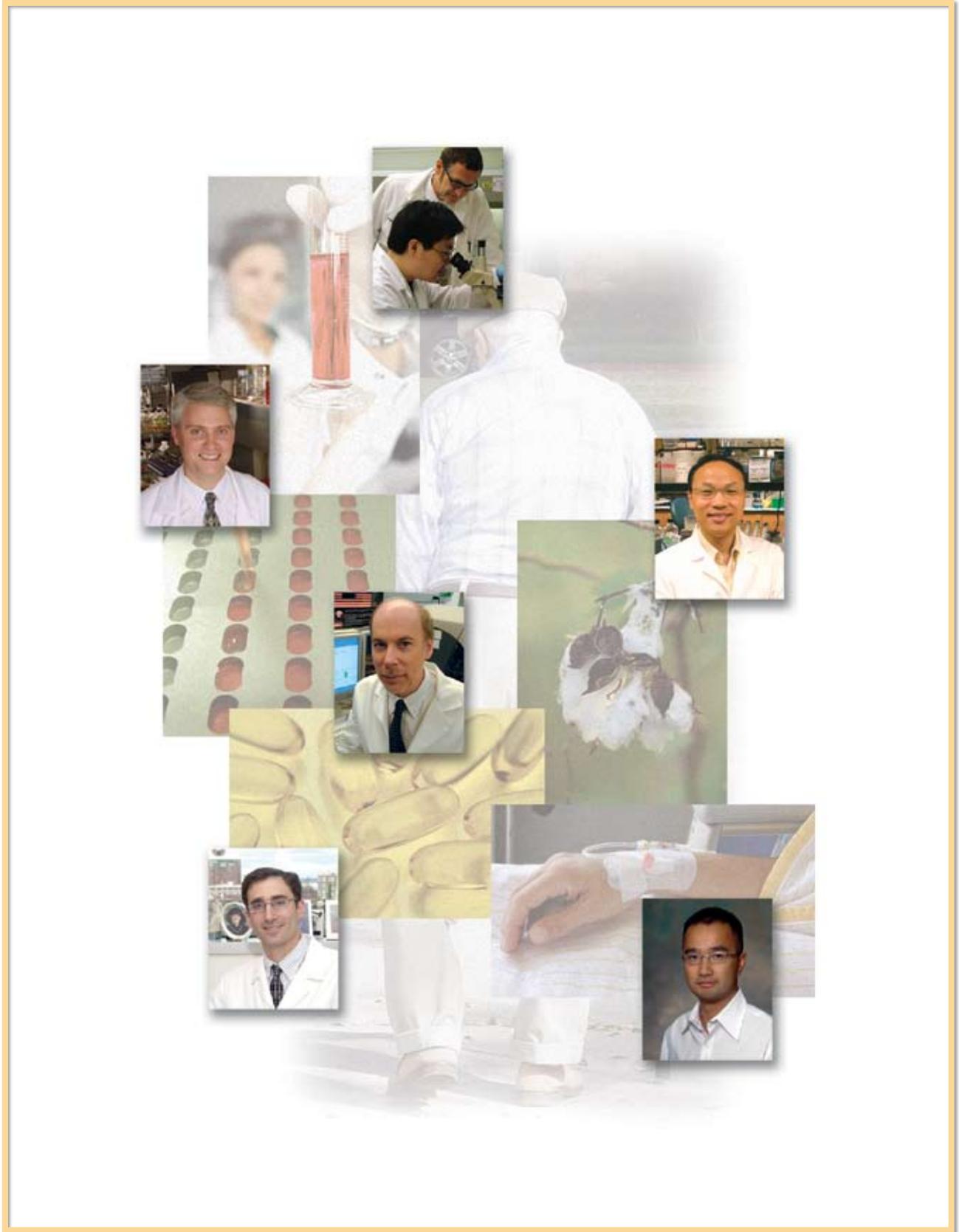




## Stoking the Prostate Cancer Research Pipeline

This section spotlights investigators whose research has the potential to touch human lives in the coming years. While many of these projects are in the beginning stages of development, their contributions to the field of prostate cancer research could prove to significantly advance the prevention, detection, and diagnosis of the disease.

- ❖ Dr. Richard Junghans of the Roger Williams General Hospital is translating immunotherapies that target prostate-specific membrane antigen (PSMA) into the clinic with the hope of developing a novel vaccine against prostate cancer.
- ❖ Dr. Kim Chi of Vancouver General Hospital is conducting a Phase I/II study of an experimental drug, OGX-011. Early results suggest that this drug may limit the recurrence of prostate cancer following radical prostatectomy.
- ❖ Dr. Dror Michaelson of Massachusetts General Hospital also is studying another novel drug to fight prostate cancer. Currently, he is conducting a Phase II study in advanced prostate cancer patients of SU011248, a drug that inhibits tyrosine kinase proteins involved in prostate cancer. SU011248 was recently approved for the treatment of gastrointestinal stromal tumors and advanced renal cell carcinomas.
- ❖ Dr. Douglas McNeel of the University of Wisconsin is developing a vaccine for prostate cancer that targets prostatic acid phosphatase. Phase I trials have commenced.
- ❖ Dr. David Peace of the University of Illinois has concentrated on identifying immunogenic peptides from PSA, which is expressed at high levels in many prostate tumors. Initial trials in patients have been successful.
- ❖ Dr. Bernard Fox of the Providence Portland Medical Center is working on a combined vaccination/chemotherapeutic regimen for the treatment of advanced, hormone-independent prostate cancer.
- ❖ Dr. Donald Miller of the University of Louisville has developed G-rich oligonucleotides (GROs) for the treatment of prostate cancer. The promising results from a Phase I clinical trial have led to pending Phase II clinical trials for GROs.
- ❖ Dr. Liang Xu of the University of Michigan Medical School is studying Gossypol, a natural product extracted from cottonseed oil. Dr. Xu has discovered that Gossypol enhances response to radiation therapy and results in prostate tumor regression.





## A Decade of Research Excellence

Together, PCRCP-supported investigators are changing the landscape of prostate cancer research. The PCRCP will be celebrating 10 years of research excellence, and progress supported by this program is changing the lives of those affected by the disease. Funded PCRCP investigators will have the opportunity to showcase their accomplishments at a PCRCP-hosted conference called “IMPACT: Innovative Minds in Prostate Cancer Today.” The meeting will take place in 2007 in Atlanta, Georgia, during September, which is National Prostate Cancer Awareness Month.



**1997**

Studies into the efficacy of G-rich oligonucleotides (GROs) began in vitro. The GROs associate with nucleolin, a protein involved in cell cycle regulation in prostate cancer cells.

Funded research on monoclonal antibodies produced against PSMA for imaging and radiotherapy of prostate cancer.

Funded initial research toward the development of cytotoxic T cells for the treatment of prostate cancer.



**1999**

Evaluation of prostatic acid phosphatase (PAP) as a candidate prostate cancer vaccine begins.

Discovered the first evidence of a correlation between expression of HER-2/neu (the receptor targeted by the breast cancer therapeutic Herceptin®) and the development of androgen independence in prostate cancer cells.



**2000**

Promising in vitro studies lead to subsequent funding by PCRCP for GROs. The Dual Phase Idea Development Award provided funding for in vivo studies needed before clinical trials.

Report of successful in vitro testing of PSMA antibodies. Dual Phase Idea Development Award granted.



**2001**

Determined that estrogen receptor-beta may promote the survival of metastatic prostate cancer cells.



**2002**

Examination of the safety and efficacy of the PAP prostate cancer vaccine.

Demonstration that patients with advanced stages of prostate cancer were able to develop cytotoxic T lymphocytes with specificity for prostate tumor cells.



Figure III-4. PCRCP-supported Therapeutic Agents and Procedures

The intent of the meeting is to promote the exchange of ideas and to explore innovative avenues of research that will advance the prostate cancer field in a forum highlighting PCRP-supported studies. Through the involvement of consumers and scientists, the IMPaCT meeting will recognize the program’s successes in funding innovative and high-impact research, addressing health disparities, and training the next generation of prostate cancer researchers. Highlighted in Figure III-4 are selected therapeutic agents and procedures that are impacting patients’ lives (at least in part) through funding obtained by the PCRP.



| 2003  | 2004  | 2005   | 2006  |
|---|---|--|---|
| <p>Development of the C4-2 model of prostate cancer bone metastases, a model that closely resembles the human disease.</p> <p>Discovered that the expression of prostate zinc transporters was lower in African Americans than in Caucasians. Dietary supplementation with zinc, which inhibits prostate cell growth, may be a useful prevention strategy.</p> <p>First demonstration that the disruption of transforming growth factor-beta signaling promotes prostate cancer metastasis.</p> | <p>Successful completion of Phase I trials for GROs. Recruitment for Phase II trials is set to begin.</p> <p>Monoclonal antibodies against PSMA reported as efficacious in animal studies.</p> <p>Identified Cox-2 promoter variants that modify prostate cancer risk in African Americans and Nigerians.</p> | <p>Demonstration of a new laser technology to precisely incise the urethra and bladder neck during preclinical studies in pigs. The Erbium: YAG laser was up to 30 times more precise than other lasers in urology.</p> <p>A randomized trial vaccination with PSA146-154 peptide was completed. Induction of specific T cell immunity to PSA146-154 peptide in patients with prostate cancer was reported to correlate with less disease progression.</p> | <p>Phase I trials have commenced for the PAP vaccine.</p> <p>Phase II trial of lutetium-labeled PSMA antibody, J591, completed in patients with metastatic, androgen-independent prostate cancer. Antitumor activity established.</p> |

