



# REPORT OF THE NEW JERSEY COMMISSION ON CANCER RESEARCH

## PROGRAM EVALUATION AND OUTCOMES

April 1, 2007

The New Jersey Commission on Cancer Research (NJCCR) was established in 1983 (Cancer Research Act of 1983 – P.L.83, Ch.6: T 52 91-u) to promote significant and original research in New Jersey into the causes, prevention, treatment and palliation of cancer and to serve as a resource to providers and consumers of cancer services.

**The Act provides \$1 million annually to:**

- 1. Review and authorize all available funds to qualifying research institutions for approved projects.**

**The NJCCR does this by:**

- ◆ Supporting both the most promising new scientists seeking to break into the competitive world of cancer research and senior investigators seeking new cancer research directions.
  - ◆ Training new scientists through its post-doctoral, pre-doctoral and summer fellowship programs.
- 2. Take the steps necessary within the state to encourage the development of cancer research projects including those on its causes, treatment, and prevention or pain control, palliation, psychosocial and behavioral aspects of persons diagnosed with cancer. It does this by:**
    - ◆ Promoting access to clinical trials throughout New Jersey, especially for minorities and the medically underserved.
    - ◆ Enhancing quality of life of cancer patients and survivors.
    - ◆ Educating patients, providers and the public at large about new discoveries in cancer research.

Other major activities of the NJCCR include the administration of resources from the New Jersey Breast Cancer Research Fund, (P.L.95, Ch.26.54A: 9-25.7), the New Jersey Prostate Cancer Research Fund (PL 2001, C 305 54:9-25.21) and the “Conquer Cancer” license plate (P.L. 97, Ch. 92, 39:3-27.90).



## I. BACKGROUND AND SIGNIFICANCE

As part of his 2006 budget address, Governor Jon Corzine called for “cost effective and functionally efficient government that will benefit and enhance the State’s economy, restore public confidence and allow for the continued delivery of vital programs.” With this charge in mind, the NJCCR recognized the need to formulate additional assessment criteria for New Jersey’s investment in cancer research. While the NJCCR monitors its activities on a regular basis, it initiated an intensive self-evaluation of its operations to measure its efficiency and effectiveness against quantifiable outcomes.

To further this objective, the NJCCR enlisted the help of Professor Dona Schneider at the Edward J. Bloustein School of Public Policy at Rutgers, The State University of New Jersey. Professor Schneider agreed to provide an independent evaluation of its programs. Christopher Hanson, a health policy doctoral student in the Bloustein School, formulated appropriate methodologies and developed specific criteria based upon quantitative and qualitative outcomes for measuring the success of NJCCR Seed Grants and Training Fellowship Programs. Major findings from his independent evaluation are summarized in this report.

## II. SEED GRANT PROGRAM

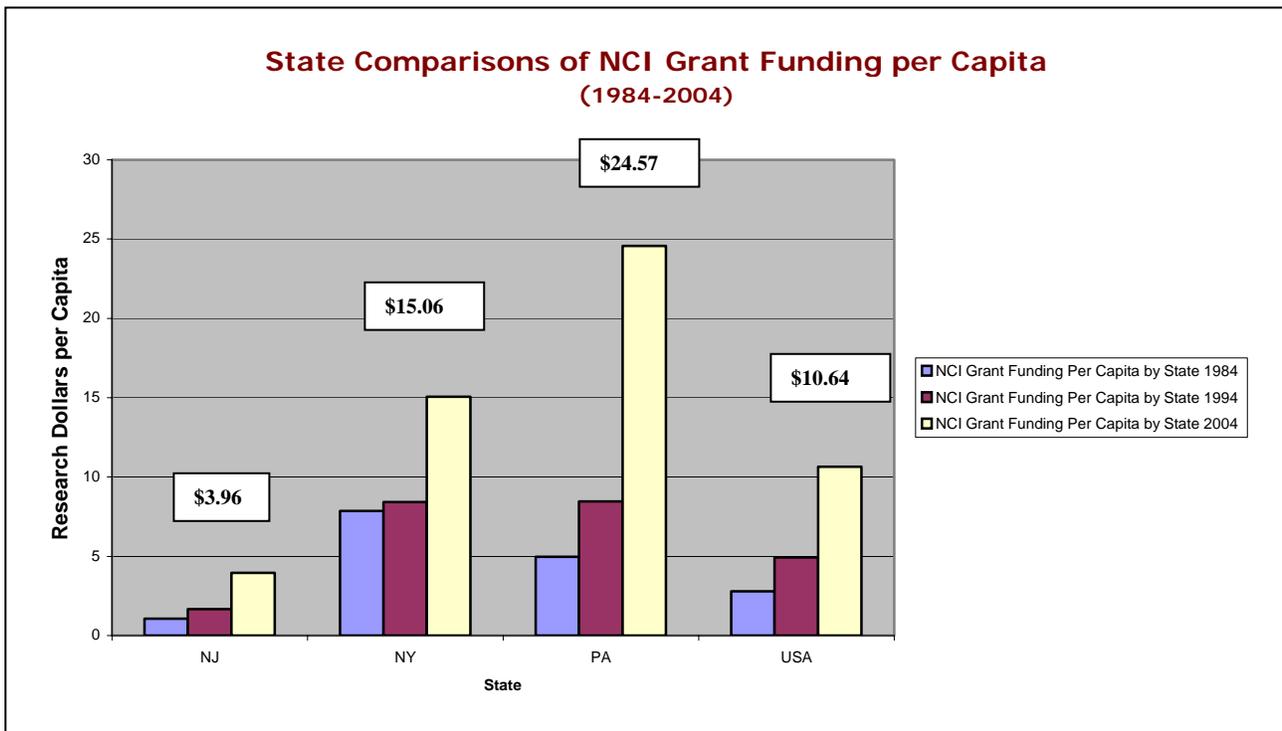
### Purpose

Use competitive Seed Grant funding mechanisms to strengthen cancer research in New Jersey by increasing the growth of national research dollars brought back to the state and stimulating investigations into emerging issues of significant concern in New Jersey.

### Background & Significance

New Jersey lags significantly behind national averages and neighboring states in National Cancer Institute (NCI) grant funding per capita (see Chart 1). In response to this concern, the NJCCR created a highly competitive grant program that relies upon **systematic scientific peer review**. This ensures that state monies for cancer research are awarded to those programs and scientists that offer the greatest potential for success. Through these awards, researchers are able to establish themselves in the rigorous world of national scientific competition as well as position themselves for national research funding. The indirect costs included with national awards contribute significant revenues for the operational budgets and infrastructure capacity of New Jersey research institutions. Consequently, the Seed Grants allow New Jersey researchers and their institutions to build the knowledge and infrastructure to **compete for additional funding** so they may deal satisfactorily with the critical problems posed by cancer for the citizens of New Jersey. This grant mechanism represents a sound, long-term investment in the health of all New Jersey citizens.





**Chart 1.** New Jersey lags behind neighboring states and the United States as a whole in attracting National Cancer Institute (NCI) dollars, the major source of cancer research funding. A major objective of the NJCCR Seed Grant Program is to reduce this gap.

**Evaluation**

Surveys were sent to all (n=59) NJCCR Seed Grant awardees from the years 1998 to 2004. Forty-nine (49) replies were obtained for a response rate of 81.4 percent. Results of the evaluation are listed below.

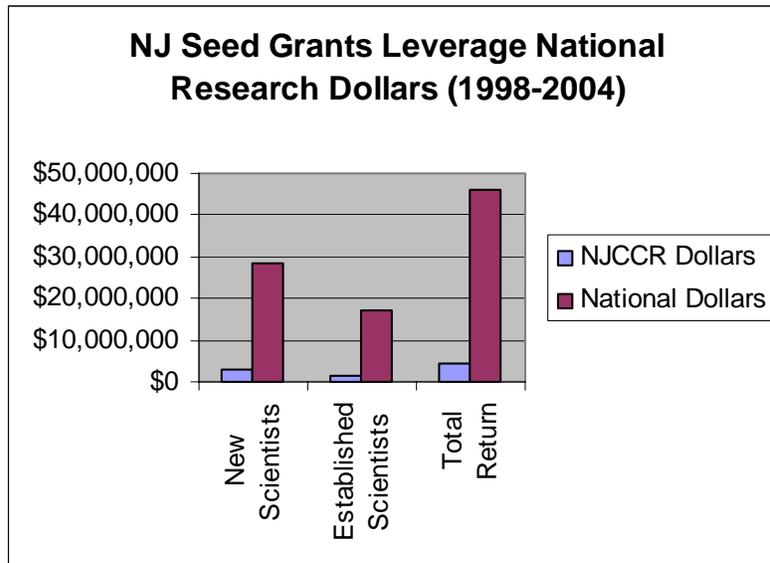
**1. Percentage of new proposals developed from data obtained with NJCCR Seed Grants**

Eighty-eight (88%) percent of NJCCR awardees **submitted proposals to national funding agencies**. Seventy-three (73%) percent did so within three years of their NJCCR Seed Grant award.

**2. Amount of national funding leveraged back to New Jersey from NJCCR Seed Grants**

Eighty-four (84%) percent of all responding grant awardees successfully obtained national funding within four years of NJCCR award completion. **NJCCR grant recipients are four times more successful in obtaining major national research grants** than the average applicants across the nation. (See national benchmarks on page 5 for comparison)

**Grantees leveraged an average \$10.44 in new research funding** for New Jersey laboratories for every dollar (\$1) of NJCCR (state) money received.



**Chart 2.** New Jersey scientists use the data and knowledge gained from their NJCCR Seed Grants to strengthen proposals to federal/national funding agencies. On average, they bring back more than ten times the amount of their original NJCCR grant in new research dollars to New Jersey. New investigators without a track record or grant history are especially successful with more than 8 in 10 getting first grants within four years of their first NJCCR awards.

### 3. Benefits to new investigators from Seed Grants

Eighty-eight (88%) percent of **new investigators received national funding** allowing them to establish their labs in New Jersey (see Benchmarks on page 5)

Thirty-three (33) **new investigators without the benefit of established reputations leveraged \$9.66 in new funding** for every dollar of NJCCR grant money.

### 4. Number of publications in peer-reviewed journals based upon knowledge gained from Seed Grants (measures knowledge dissemination)

Eighty-three (83%) percent of NJCCR grantees **published in at least one (1) peer-reviewed journal** and sixty (60%) percent published in two or more journals with an average of 2.1 papers per grantee.

### 5. Benefits of Seed Grants to awardees (Qualitative results)

- a. Strengthens ability to successfully compete for larger grants
- b. Enhances capacity to change research direction
- c. Allows exploration of promising new areas of research
- d. Increases opportunities for peer-reviewed presentations and national collaborations

### **National Benchmarks for Comparison**

The average NCI (RO1) new grant submission success rate for 1999 to 2004 was 17.45 percent. See: H.G. Mandel and E.S. Vesell, Declines in Funding of NIH R01 Research Grants, *Science* 313 (2006), 1387–1388.

The average National Science Foundation (NSF) Competitive Funding Rate for New Grant Awards for 1996 to 2005) was 18.9 percent. See: [http://www10.gencat.net/agaur\\_web/recursos/jornades/NSF\\_CRobinson.pdf](http://www10.gencat.net/agaur_web/recursos/jornades/NSF_CRobinson.pdf).

The average American Cancer Society (ACS) new submission grant award rate for 1998 to 2002 was 25 percent. See: R. Vogler in Enhancing Philanthropy’s Support of Biomedical Scientists: Proceedings of a Workshop on Evaluation. National Academies Press (2006), page 77.

## **III. TRAINING FELLOWSHIP PROGRAM**

### **Purpose**

Promote training of cancer researchers in New Jersey as a means of recruiting outstanding scientists and enhancing the research environment in the state.

### **Program Significance**

Attracting talented postdoctoral trainees to New Jersey expands research capacity within the state by providing a talented pool of young scientists who are essential for successful basic and translational research. According to the Committee on Science & Engineering and Public Policy (2006), “The postdoctoral population has become indispensable to science and engineering enterprises, performing a substantial portion of the nation’s research in every setting.”

In addition to generating new discoveries and knowledge, post-doctoral fellows often lay the scientific groundwork for larger, national grants and train other students on a daily basis. The fellows also represent an excellent source of well-trained scientists for New Jersey’s biotechnology and pharmaceutical industry.

### **Evaluation**

The effectiveness of the NJCCR Training Fellowship Program at stimulating cancer research activity was evaluated for post-doctoral awardees for the period 1998 to 2004. Twenty (20) post-doctoral fellows were identified and surveyed. Thirteen (13) replies were received for a sixty-five (65%) percent response rate. These small numbers do not allow for a statistical analysis, but the information provided by the awardees is summarized below.

#### **1. Fellows found academic or industry positions.**

Sixty-nine (69%) percent of post-doctoral fellows who responded found academic or industry research positions within four years of their Training Fellowship Award (See Benchmarks for comparison).

#### **2. Fellows produced peer-reviewed papers.**

Eighty-five (85%) percent published at least two peer-reviewed papers from their postdoctoral work.

### 3. Fellows produced benefits for their sponsors' New Jersey laboratories.

One hundred (100%) percent of sponsors rated the Training Fellowship Awards as very or extremely useful to the development of their laboratory programs.

Sixty-one (61%) percent of sponsors stated that the fellows contributed to the ability of their laboratory to attract national funding in amounts **between \$1.7 and \$3.5 million per Training Fellowship awarded.**

### 4. Benefits of Training Fellowships to awardees (Qualitative Results)

- a. Enhances the ability to begin a new research direction
- b. Initiates involvement in a new discovery or significant finding
- c. Supports an independent ability to attract national funding
- d. Provides supervised training for post-doctoral, graduate and undergraduate students in cancer research

### National Benchmarks for Comparison

Seventy-seven (77%) percent of NIH-awarded Fellows and 72.3 percent of Non-NIH Fellows hold research positions in academia or industry from 7 to 14 years after post-doctoral completion. As NJCCR Fellows were evaluated only zero (0) to four (4) years after their post-doctoral Training Fellowship awards, these benchmark comparisons underestimate their success rate. See: C. Sherman in Enhancing Philanthropy's Support of Biomedical Scientists: Proceedings of a Workshop on Evaluation. National Academies Press (2006), page 120.



**“I would like to express my gratitude for the great support I received from your agency. During the postdoctoral training funded by the NJCCR I co-authored 14 papers which are published or accepted for publication in various biomedical journals and I actively participated in several scientific events. The scientific activity performed while a postdoctoral fellow had a high impact on my career.**

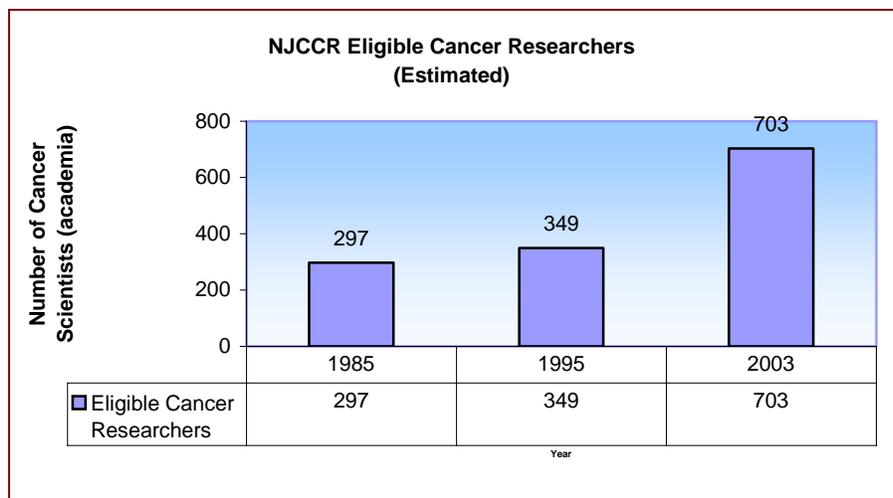
**I am happy to let you know that recently I was offered a research scientist (permanent) position with the Computational Biology and Bioinformatics Department at the Broad Institute of MIT and Harvard. In addition, I have a visiting position with the Simons Center for Systems Biology at the Institute for Advanced Study in Princeton under the leadership of Professor Arnold Levine.**

**The opportunities to work in these prestigious institutions were offered to me mainly based on the work done as a postdoctoral fellow funded by the NJCCR and I would like to thank you again very much for your generous help.”**

**Gabriele Alexe, Ph.D.  
NJCCR Post-doctoral Fellow  
2000-2002**

## IV. THE CHALLENGE OF INCREASED RESEARCH CAPACITY

The number of cancer researchers eligible for NJCCR Seed Grant funding in New Jersey has more than doubled, from 297 in 1985 to 703 in 2004 (Chart 3), yet the NJCCR budget has remained flat, decreasing more than 4-fold in buying power over this same period (Chart 4). This expanded pool of scientists provides the opportunity to open new avenues of cancer research and to train cancer research fellows. However, many of these scientists find that funding to help them jump-start their projects and host fellows is simply unavailable. It is critical that the NJCCR be able to respond to the needs of this expanding group of researchers who will foster progress in cancer research in the state by building infrastructure and research programs that will improve not only treatment, but cancer prevention and control.



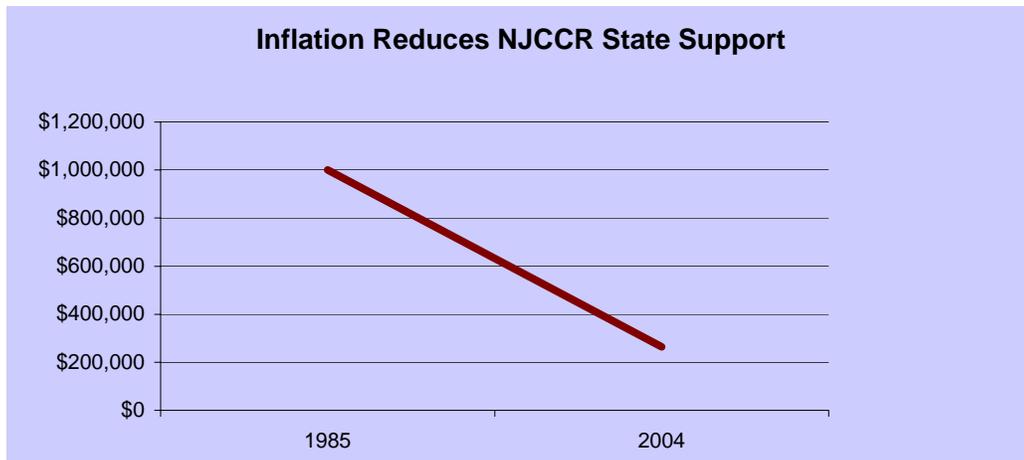
**Chart 3.** Jump-starting new careers and research directions for scientists brought into the state through the expansion of New Jersey’s research institutions is imperative for progress in cancer research. It is no longer possible for the NJCCR to meet the needs of all worthy Seed Grant and Training Fellowship applicants because of the flat funding allocation the agency receives annually.

### Funding Restrictions

1. **The NJCCR was forced to reduce seven (7) Seed Grant applications by 50 percent or more (range \$49,500-\$74,470) during the 2005-2006 grant cycle.**
2. **The NJCCR was unable to fund 13 applications recommended for funding.**
3. **The NJCCR was forced to reduce its pre- and post-doctoral Training Fellowship awards by 50 percent over the past ten (10) years, to only five (5) per year.**

The NJCCR struggles to provide stipend support at NIH levels for current awards. Evaluations of post-doctoral fellowship programs at the national level indicate that such reductions have a negative affect on the quality of training and result in more new scientists leaving research.

4. **Because of flat funding, the NJCCR is less able to foster and solidify New Jersey’s cancer infrastructure. This limits the benefit it can bring to New Jersey citizens.**



**Chart 4.** Inflation reduces the state’s appropriation to less than a quarter of its initial value.

Because the state appropriation for the NJCCR has not increased from the original \$1 million dollars set out by P.L. 83, C 6, t52; 9-u1 in 1983, the real value of this appropriation has been eroded by 73.5 percent (based upon the Biomedical Research and Development Price Index @ 3.5% per annum). If the NJCCR’s original funding level simply kept parity with inflation, the present value for its FY 2007 state appropriation should be \$2.735 million. In fact, budgets for more recently created state research agencies reflect a much more realistic level of support (i.e., New Jersey Spinal Injury Commission, New Jersey Traumatic Brain Injury Commission and New Jersey Research Council on Autism, each funded at about \$4.5 million per annum). A similar appropriation for the NJCCR is critical if the potential benefits it can bring to the state are to be fully realized.

## V. REACHING OUT TO SERVE NEW JERSEY

Cancer is the number one health concern of the citizens of New Jersey. The NJCCR has a long standing history of innovative programs and educational initiatives aimed at community outreach and research dissemination. Together with its advisory groups and community partners, it has worked to mobilize, integrate, and coordinate the delivery of research discovery and evidence-based interventions to all citizens of New Jersey. Highlights of these activities are provided in this section.

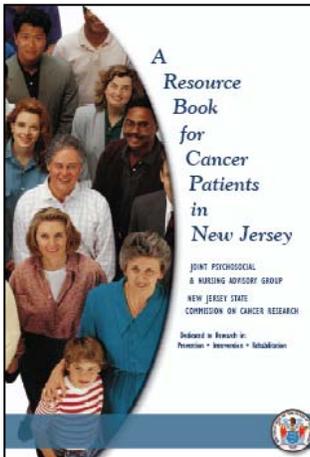
### IMPACT NJ

Participation in cancer clinical trials (CCTs) is low for many minorities and underserved populations. Misperceptions, inaccurate beliefs, and myths about clinical trials are common barriers, yet few actual interventions exist to reduce these obstacles.

In 2001, the NJCCR joined with the 100 Black Men of New Jersey to address the low participation of ethnic minorities in cancer clinical trials. The result was the formation of a new program, called IMPACT NJ, representing a partnership that includes community leaders, researchers, healthcare providers, and faith based groups.

Created to reduce barriers to enrollment in CCTs, IMPACT NJ’s goals are to develop and launch a community-based education program aimed at increasing knowledge and understanding of the CCT process, engaging consensus building to address barriers, and promoting self-advocacy.





## **A RESOURCE BOOK FOR CANCER PATIENTS IN NEW JERSEY**

**Helping patients deal with the complexities of cancer, find critical resources and learn self advocacy.**

This resource book, assembled by the Psychosocial/Nursing Advisory Group of the NJCCR, provides anyone facing cancer with critical information and guidance from the day of diagnosis to long term survivorship.

It is provided free of charge to cancer patients throughout New Jersey.

## **TAKING AIM AT IMPROVING QUALITY OF LIFE FOR CANCER PATIENTS**

As survival improves for cancer patients, concerns about the effects of cancer and its treatment on the quality of a cancer patient's life have been raised. The choices facing patients and families are considerably more complex today, requiring timely and comprehensive information about the physical, emotional and financial toll of treatment. The NJCCR's Psychosocial/Nursing Advisory Group designed and conducted a "roundtable" to identify strategies to move New Jersey forward as it seeks to improve quality of life for cancer patients. The report, including policy issues and considerations, may be found at [http://www.nj.gov/health/ccr/documents/2006\\_1.pdf](http://www.nj.gov/health/ccr/documents/2006_1.pdf)

## **SHARING PERSPECTIVES: RESEARCHERS REACHING OUT**

Educating cancer patients, survivors, and the public about emerging developments in cancer research has always been a high priority for the NJCCR. Designed by cancer patients for cancer patients, this program seeks to open channels of communication and encourage interaction between researchers and communities of cancer survivors and cancer patient advocates. Highlights of cancer studies by New Jersey scientists are emphasized.



## **CANCER & THE OLDER ADULT**

More than one-half of all new cancer diagnoses are in adults over the age of 65 and more than 70% of cancer deaths occur in this age group. Yet, very little attention has been paid to the needs of cancer and older adults. In order to strategically address this emerging concern, the NJCCR formed a Task Force on Cancer in the Older Adult to promote a statewide, comprehensive approach to this problem with a special focus on research and clinical trials, myths and misperceptions, co-morbidities, and treatment decisions and screening/wellness. The group has been studying this issue for several years and is preparing to publish a strategic policy report in the coming year. For additional information, see [http://www.nj.gov/health/ccr/cancer\\_and\\_aging.pdf](http://www.nj.gov/health/ccr/cancer_and_aging.pdf)

## CANCER SURVIVORSHIP

More than 60% of people diagnosed with cancer now survive five years or more after treatment. Many survivors who anticipated a return to “normal” health find themselves experiencing ongoing and distressing health and psychosocial problems. The Joint Nursing/Psychosocial Advisory Group to the NJCCR sponsored a series of national conferences for researchers and health providers to bring attention to this important concern.

Reports on these activities can be found at <http://www.nj.gov/health/ccr/survivorshiprpt.pdf>

## BREAST and PROSTATE CANCER RESEARCH FUNDS

In 1995, the New Jersey Breast Cancer Research Fund was established and fueled through individual contributions from a check off box on the New Jersey State Income tax form. In 2005, a New Jersey Prostate Cancer Research Fund was created and efforts to expand the reach of that fund are under development. One hundred percent of donations to the fund are awarded by the NJCCR in competitive grants to talented breast and prostate cancer scientists.



## VI. SUMMARY

An independent evaluation of the NJCCR determined that the agency responded to its 1983 mandates by developing successful programs aimed at:

- Supporting promising new scientists seeking to break into the competitive world of cancer research and senior investigators seeking new cancer research directions (Seed Grant Program).
- Training new cancer scientists (Training Fellowship Program).
- Promoting access to clinical trials throughout New Jersey, especially for minorities and the medically underserved, enhancing quality of life of cancer patients and survivors, and educating patients, providers and the public at large about new discoveries in cancer research (Outreach Programs).

The NJCCR plays a clear and significant role in enhancing cancer research. Its open and fair system of grant awards provides proven benefits to scientists and research institutions throughout the state by **leveraging \$10.44 back to New Jersey for every state dollar spent**. The Seed Grant Program stimulates new ideas and research directions, and opens doors to national recognition and funding for both new and established cancer researchers. Research results from the Seed Grant Program are shared via the peer-reviewed literature and by grantee presentations of their research findings at national conferences, thus providing national recognition for New Jersey’s cancer researchers and their research institutions. Increased funding for state research institutions is also expanded through the indirect costs included in the leveraged federal and national funding awards.

Training Fellowships contribute to the development of a technically skilled workforce that adds substantial benefit to research laboratories across the state. This improves laboratory competitiveness, generates new research ideas and augments biomedical training. The fellowships also assure a highly-trained scientific workforce for New Jersey’s pharmaceutical and biotechnology industries.

The NJCCR strategies to promote original and significant cancer research in New Jersey have been enormously effective. Since its inception in 1983, the NJCCR has helped launch the careers of over 250 scientists and provided resources to train more than 100 Fellows in cancer research. This success, however, would likely have been even greater if the agency had not been restricted by flat funding. In other words, if the NJCCR annual budget had been adjusted for inflation, an even better return would likely have been realized. Given that cancer costs the State of New Jersey almost \$6 billion annually, it would be fiscally responsible for the state to identify a mechanism to increase the NJCCR appropriation at least to equivalent 2007 dollars (\$2.73 million). An additional ~2-fold increase (to \$5 million) would take advantage of the expanded scientist base in New Jersey and represents a solid investment for both the state and its citizens.

It is evident that the progress and achievements detailed in this report were realized through the vision, dedication and hard work of many individuals. The NJCCR is especially grateful to all its dedicated volunteers for their significant contributions through the years. Additionally, the NJCCR benefits and appreciates the strong support and services provided by the NJ Department of Health and Senior Services.

## 2007-2008 Members of the New Jersey Commission on Cancer Research

The overall objectives, strategies and priorities of the NJCCR are set by the Commissioners, who actively participate in overseeing the program and make final recommendations on the research projects to be funded. In each Grant Cycle, the NJCCR awards grants based on the member's recommendations, following peer reviewer's evaluations, assessment of responsiveness to program priorities, and available funds.

### **Chairwoman:**

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Director-Institute for Cancer Research  
Fox Chase Cancer Center

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Professor of Pediatrics and Pharmacology  
Director of Pediatric Oncology  
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