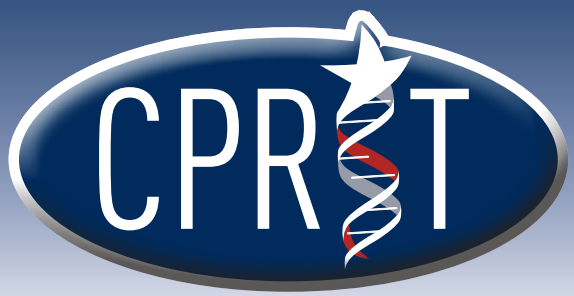


CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

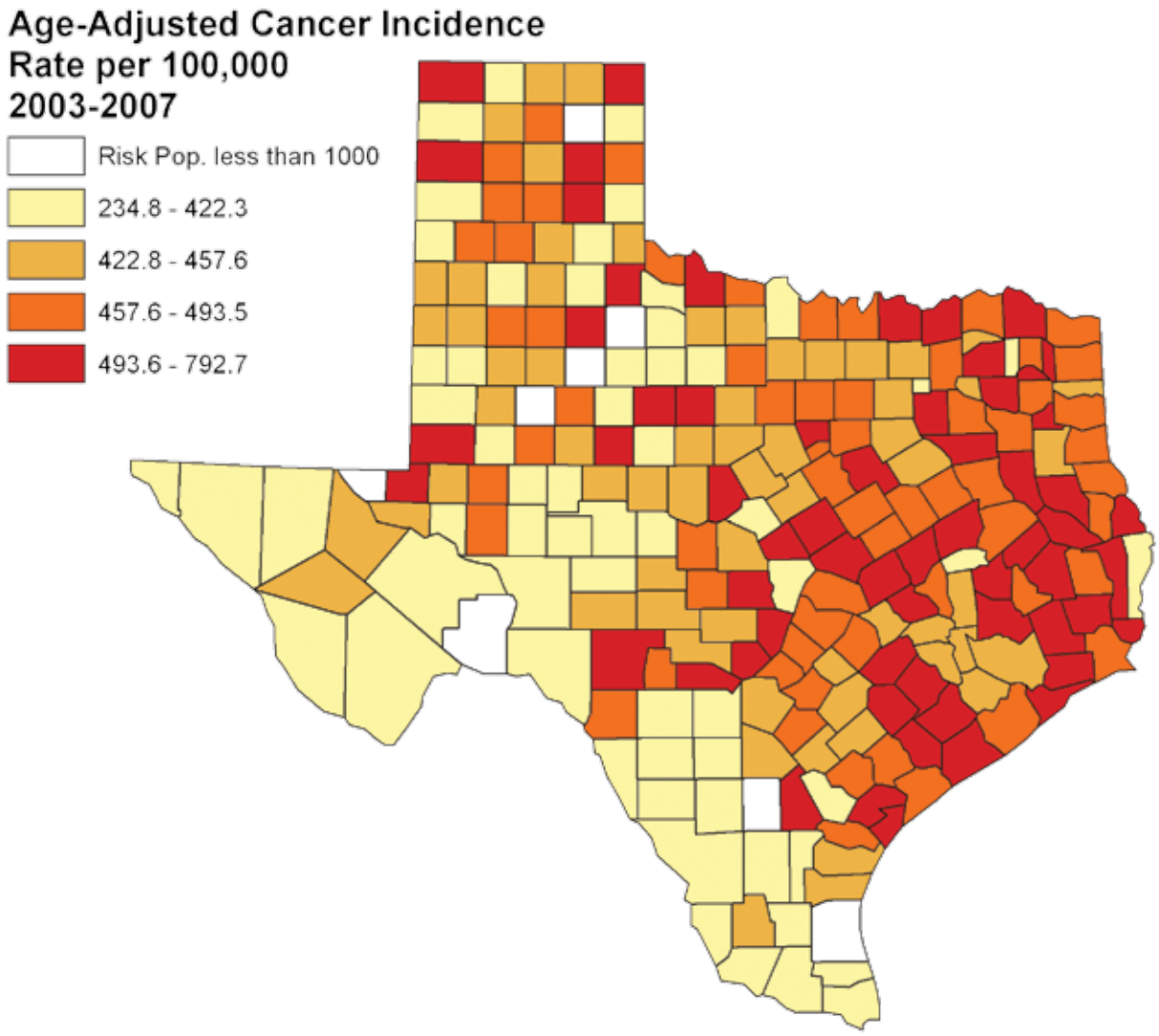
TEXAS TAKES ON CANCER

CPRIT Annual Report

March 1, 2011

www.cprit.state.tx.us

THE IMPACT OF CANCER ACROSS TEXAS



SOURCE: TEXAS CANCER REGISTRY, CANCER INCIDENCE FILE, MARCH 2010.

The CPRIT Annual Report is published by the Cancer Prevention and Research Institute of Texas (CPRIT).

Printed in the United States.

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Publication Number FS11 110 01

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CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

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LETTER FROM THE EXECUTIVE DIRECTOR

The Honorable Rick Perry, *Governor*
The Honorable David Dewhurst, *Lieutenant Governor*
The Honorable Joe Straus, *Speaker of the House of Representatives*
Capitol Building
Austin, Texas 78711

March 1, 2011

Dear Governor Perry, Lt. Governor Dewhurst, and Speaker Straus,

On behalf of the Cancer Prevention and Research Institute of Texas (CPRIT) and its Oversight Committee, I am pleased to submit CPRIT's first annual report chronicling the initial eighteen months of the Institute's mission to create a Texas free of cancer.

Cancer is an epidemic that is draining this state of its resources, in addition to exacting a devastating toll on our citizens. It has been four decades since the United States declared war on cancer, yet the ravaging effects of this insidious opponent are staggering. More than 500,000 Americans — 40,000 Texans — will die from cancer this year. Beyond the irreplaceable lives lost, cancer costs Texas an estimated $25.3 billion annually — almost $70 million each day.

Led by the eleven dedicated members of CPRIT's governing body and doing what Texans asked us to do, the Institute has blazed a path by placing a premium on innovative new ideas, increasing cancer prevention and detection efforts in Texas, and expediting commercialization efforts so that the discoveries made in laboratories across the state will reach Texans faster. We are committed to keeping our operations nimble, efficient and entrepreneurial. We will measure ourselves in lives saved, cancers prevented, and economic benefits to the state.

Since September 2009, CPRIT has issued 33 funding opportunities seeking the most innovative cancer research, commercialization and prevention programs in Texas. There has been no shortage of good ideas, and we received more than 1,800 project proposals. In order to ensure that Texas is investing in the best of the best, CPRIT instituted a gold-standard review process for proposals that is free from bias and conflicts of interest. Relying upon a bench of 150 scientists, bioscience commercialization professionals and cancer prevention experts, the Institute is able to identify the most promising and innovative projects.

Texas is making a remarkable contribution in the war on cancer. Through the Institute, the lives of Texans are impacted today by proven cancer prevention programs and services. Over the course of 18 months, the Institute has become one of the largest cancer research grant-making organizations in the United States — second only to the federal government. CPRIT investments are projected to inject nearly $1 billion annually into local economies around the state and generate $435 million in state and local revenue. We are creating hundreds of high-quality jobs in Texas and saving cancer costs for our families,

"Texas is positioned to wage the war on cancer as few others can. *Texas voters overwhelmingly approved the creation of the Institute through an amendment to the Texas Constitution in 2007 and committed three billion dollars to invest in groundbreaking cancer research, prevention programs and services through 2021."*

–Bill Gimson, Executive Director

our friends and all our citizens. The Institute has made these early strides while keeping its operations small, efficient and effective. With a staff of 19 employees, CPRIT's fiscal year 2010 operation costs were only 1.5 percent of its total annual expenditures.

This is a story of early successes with the promise and commitment of more to come. With the rapid progress in biomedical research, especially advances that permit detailed definition of the genetic basis of different types of cancer, the opportunity for improving cancer care in Texas has never been greater. Investing in cancer research and prevention efforts in this state isn't a luxury, it is a necessity. Now is not the time for incremental progress, and we will not be content with marginal improvements. Now is the right time, the best time for innovation that will lead to dramatic leaps forward and many more lives saved. With appropriate resources, future years will bring more scientific discoveries, more Texans reached through cancer prevention initiatives, more brainpower dedicated to blockbuster drug development, more hope for Texas families, and more victories.

The eyes of the nation are truly upon Texas and we will make the most of this opportunity to change the face of cancer!

Sincerely,

Bill Gimson
Executive Director

HIGHLIGHTS OF CPRIT'S EARLY SUCCESSES

- Awarding $267.5 million for 229 different cancer research, commercialization and prevention projects at 55 institutions, organizations, and companies throughout Texas since September 2009.
- Together with matching funds committed by CPRIT grant recipients, nearly $400 million has been dedicated to cancer research, commercialization and prevention efforts in Texas.
- Recruiting ten outstanding CPRIT Scholars in Cancer Research to Texas. To conduct the best science and research, this inaugural class of CPRIT Scholars represents the top talent recruited from outside the state. Attracting these scientists to Texas enhances the caliber of cancer research statewide.
- Reaching over two million Texans with current prevention efforts, directly impacting 85 percent of Texas counties and providing cancer screening to thousands of Texans who have never been checked.
- Investing $32 million in seven Texas companies developing promising cancer drugs, diagnostics, and devices with a potential return of $40 million.
- Funding the creation of a first-of-its-kind statewide clinical trials network with 14 founding institutions and organizations that will allow Texans to receive cutting edge treatments in their own communities.
- Convening 850 scientists and cancer prevention specialists in Austin for the inaugural *CPRIT Innovations in Cancer Prevention and Research Conference* in November 2010.

AN ECONOMIC ASSESSMENT

The Cost of Cancer and the Benefits of CPRIT and its Programs: Synopsis of Key Results for Fiscal Year 2010

Cancer Costs

$25.3 BILLION
Direct cost statewide

Annual direct medical costs and morbidity and mortality losses associated with cancer are estimated to be approximately $25.3 billion in Texas in 2010, a 15.8% increase since 2007.

CPRIT Impact

$852.3 MILLION
Output (real gross product) and 11,537 jobs

Estimated total annual impact on Texas business activity of all CPRIT prevention and research programs — including initial outlays and downstream effects.

CPRIT Impact

$435.3 MILLION
Generated in annual state and local revenue

The ongoing outlays for CPRIT operations and programs are estimated to generate $265.6 million in annual state revenue, as well as $169.7 million in annual revenue to various local governments.

Investment in research, screening and related activities aimed at reducing the incidence and severity of cancer in Texas not only changes lives but also generates important economic benefits for the state. Such investments have the potential to both reduce the cost of cancer through improving outcomes and serve as a catalyst for business development in other related industries such as biomedicine.

The Perryman Group (TPG) estimates the annual direct medical costs and morbidity and mortality losses associated with cancer in Texas in 2010 to be approximately $25.3 billion, an increase of 15.8 percent since 2007. Because the treatment cost component represents a loss to various payers, there is a "multiplier" effect because these funds could otherwise be redeployed into business activity. The mortality and morbidity estimates TPG used include productivity assumptions below historical patterns and future projections. Average compensation (rather than per capita) was used to better capture any disparity between state and national earnings patterns in computing lost or foregone income. Foregone income necessarily means that production, spending, employment, and other measures of economic activity are also foregone.

Even beyond the potentially life-changing influence of reducing the incidence and severity of the disease, the investment in research, screening, and other prevention activities generates substantial economic impacts. The current total annual impact of all prevention and research programs (including initial outlays and downstream effects) associated with CPRIT on Texas business activity was found to be $852.3 million in output (real gross product) and 11,537 jobs. Moreover, the investment has the potential to reduce the cost of cancer through improving outcomes. Returns on investments in medical research include jobs created in the private sector, health care costs saved, the value of increased longevity, the value of reduced morbidity and disability, and the benefits of newer medicines and therapies. The positive economic effects of research activities also go far beyond the initial stimulus. Research leads to better cancer outcomes (and, thus, lower costs), spinoff activity, and the attraction of top researchers who can attract additional grant funds to the state.

Even beyond these gains in business activity directly stemming from CPRIT investments, improved outcomes from screening and prevention could further enhance the economy. Research sponsored by CPRIT could also generate breakthroughs which lessen the cost of cancer, facilitate the attraction of more researchers, and yield spinoff companies.

ABOUT THE ECONOMIC ASSESSMENT

CPRIT's governing statute directs the Institute to prepare an annual estimate of how much cancer has cost the state. The Perryman Group produced an extensive economic assessment for CPRIT detailing cancer's statewide impact for the period between September 1, 2009 and August 31, 2010. The full 163 page report, *A War Worth Waging: An Economic Assessment of the Cost of Cancer and the Benefits of Cancer Prevention and Research Institute of Texas (CPRIT) and its Programs*, published December 2010, is available at www.cprit.state.tx.us.

CPRIT'S GRANT AWARD RECIPIENTS SEPTEMBER 1, 2009 – MARCH 1, 2011

Institution/Organization	No.	Prevention Awards	No.	Research / Commercialization Awards	Cumulative Total	Institution/ Organization Totals
Apollo Endosurgery	0	$ —	1	$ 5,001,063	1	$ 5,001,063
Asian American Health Coalition of Greater Houston (dba Hope Clinic)	2	$ 1,265,881	0	$ —	2	$ 1,265,881
Asian Breast Health Outreach Project at Methodist Richardson Medical Center	1	$ 536,490	0	$ —	1	$ 536,490
Baylor College of Dentistry—TAMU Health Science Center	1	$ 203,244	0	$ —	1	$ 203,244
Baylor College of Medicine	2	$ 3,453,131	27	$ 35,471,336	29	$ 38,924,467
Baylor University	0	$ —	1	$ 200,000	1	$ 200,000
Cancer Foundation for Life	1	$ 100,000	0	$ —	1	$ 100,000
Cancer Services Network	1	$ 99,581	0	$ —	1	$ 99,581
City of Laredo Health Department	1	$ 2,497,500	0	$ —	1	$ 2,497,500
Clinical Trials Network (CTNET)	0	$ —	1	$ 25,213,675	1	$ 25,213,675
Damascus Pharmaceuticals, Inc.	0	$ —	1	$ 11,044,931	1	$ 11,044,931
Daughters of Charity Health Services of Austin (dba SETON Healthcare Network)	1	$ 128,640	0	$ —	1	$ 128,640
Department of State Health Services	1	$ 335,271	0	$ —	1	$ 335,271
Funding Solutions	1	$ 157,494	0	$ —	1	$ 157,494
Gradalis, Inc. (MIRA Sub Award)	0	$ —	0	$ 748,906	—	$ 748,906
Ingeneron, Inc. (Houston)	0	$ —	1	$ 198,111	1	$ 198,111
Lance Armstrong Foundation	1	$ 250,000	0	$ —	1	$ 250,000
LRGV Community Health Management Corporation, Inc. dba El Milagro Clinic	1	$ 150,000	0	$ —	1	$ 150,000
Mercy Ministries of Laredo	1	$ 300,000	0	$ —	1	$ 300,000
MHMR of Tarrant County	1	$ 149,812	0	$ —	1	$ 149,812
Migrant Clinicians Network	1	$ 534,448	0	$ —	1	$ 534,448
Mirna Therapeutics, Inc.	0	$ —	1	$ 10,297,454	1	$ 10,297,454
Rice University	0	$ —	3	$ 5,241,977	3	$ 5,241,977
Rules—Based Medicine	0	$ —	1	$ 3,024,432	1	$ 3,024,432
SETON Family of Hospitals	1	$ 592,204	0	$ —	1	$ 592,204
Shannon Business Services	1	$ 255,198	0	$ —	1	$ 255,198
South Texas Rural Health Services, Inc.	1	$ 149,971	0	$ —	1	$ 149,971
Texas A&M University	2	$ 876,677	2	$ 399,894	4	$ 1,276,571
Texas A&M University System Health Science Center	2	$ 594,901	1	$ 947,367	3	$ 1,542,268
Texas A&M University System HSC Research Foundation	1	$ 339,932	0	$ —	1	$ 339,932
Texas Agrilife Extension Service	2	$ 712,125	0	$ —	2	$ 712,125
Texas Life Science Foundation	0	$ —	1	$ 7,745	1	$ 7,745
Texas Medical Association	2	$ 967,425	0	$ —	2	$ 967,425
Texas Nurses Foundation	4	$ 1,744,040	0	$ —	4	$ 1,744,040
Texas Tech University	2	$ 595,660	1	$ 199,796	3	$ 795,456
Texas Tech University Health Sciences Center	3	$ 2,148,871	3	$ 2,564,857	6	$ 4,713,728
The Bridge Breast Network	1	$ 989,103	0	$ —	1	$ 989,103
The Cooper Institute	1	$ 592,134	0	$ —	1	$ 592,134

CPRIT'S GRANT AWARD RECIPIENTS CONTINUED

Institution/Organization	No.	Prevention Awards	No.	Research / Commercialization Awards	Cumulative Total	Institution/ Organization Totals
The Methodist Hospital Research Institute	0	$ —	4	$ 4,854,740	4	$ 4,854,740
The Rose (Houston)	1	$ 998,045	0	$ —	1	$ 998,045
The University of North Texas Health Science Center at Fort Worth	3	$ 895,728	2	$ 179,834	5	$ 1,075,562
The University of Texas at Arlington	0	$ —	1	$ 200,000	1	$ 200,000
The University of Texas at Austin	0	$ —	7	$ 8,929,918	7	$ 8,929,918
The University of Texas at Dallas	0	$ —	2	$ 1,913,971	2	$ 1,913,971
The University of Texas at San Antonio	0	$ —	1	$ 199,906	1	$ 199,906
The University of Texas Health Science Center at Houston	3	$ 1,731,287	8	$ 8,233,302	11	$ 9,964,589
The University of Texas Health Science Center at San Antonio	3	$ 1,487,142	5	$ 8,955,507	8	$ 10,442,649
The University of Texas M.D. Anderson Cancer Center	6	$ 1,641,264	37	$ 43,407,255	43	$ 45,048,519
The University of Texas Medical Branch at Galveston	1	$ 15,000	1	$ 4,052,471	2	$ 4,067,471
The University of Texas Medical School at Houston	0	$ —	1	$ 2,000,000	1	$ 2,000,000
The University of Texas Southwestern Medical Center at Dallas	4	$ 3,197,353	44	$ 45,872,856	48	$ 49,070,209
University Health System (San Antonio)	4	$ 1,799,855	0	$ —	4	$ 1,799,855
University of Houston	1	$ 272,753	3	$ 3,021,575	4	$ 3,294,328
University of North Texas	0	$ —	1	$ 200,000	1	$ 200,000
Visualase, Inc. (Houston, Texas)	0	$ —	1	$ 2,151,776	1	$ 2,151,776
TOTAL AWARDS	**66**	**$ 32,758,160**	**163**	**$ 234,734,655**	**229**	**$ 267,492,815**

REVISED 3/1/2011

CITY	Number of Awards	Total Award Amount
Abilene	1	$ 99,581
Arlington	1	200,000
Austin	22	31,812,640
College Station	10	3,870,896
Cotulla	1	149,971
Dallas	54	64,562,498
Fort Worth	8	1,525,374
Galveston	2	4,067,471
Houston	101	139,156,108
Laredo	2	2,797,500
Lubbock	9	5,509,184
McAllen	1	150,000
Paris	1	157,494
Richardson	1	536,490
San Angelo	1	255,198
San Antonio	13	12,442,410
Waco	1	200,000
TOTALS	**229**	**$ 267,492,815**

WHERE WE ARE TODAY…

Texas leads the nation in its commitment to the war on cancer. Texans voted overwhelmingly to amend the Texas Constitution in 2007, creating CPRIT and committing $3 billion to expedite innovation in the area of cancer research, commercialization of cancer drugs and therapies, and cancer prevention efforts. The Institute's mission is to invest Texans' money in the best minds in the state to create a Texas free of cancer. CPRIT's investments will be leveraged with public, private, and academic stakeholders to bring better, faster treatments to patients who need them and to develop targeted prevention and early detection strategies for all Texans.

The initiative to place Texas at the forefront of cancer research, commercialization and prevention efforts is well underway. Since officially opening its doors in September 2009, CPRIT has invested more than $267.5 million in the most creative, innovative cancer research, commercialization and prevention programs in Texas. CPRIT has the resources to wage the war on cancer as few others can. The $3 billion entrusted to CPRIT is a powerful weapon against cancer and a profound investment in the health of the citizens of our great state.

Cancer represents more than 100 distinct diseases, and each type of cancer possesses distinct risk factors and manifestations that necessitate different prevention measures and treatments. Some cancers are preventable, while others can be successfully treated — even cured — if detected early enough. Survival rates vary greatly, depending on cancer site, stage at diagnosis, access to care, and a host of individual factors. There is no single cause or cure for cancer. Despite great advances, cancer is the leading cause of death for Texans under the age of 85, accounting for nearly one of every four deaths in this state. Yet the opportunity for improving cancer care has never been greater because of rapid progress in biomedical research, especially advances that permit detailed definition of the genetic basis of different types of cancer.

Under the guidance of the Oversight Committee, CPRIT's governing board, CPRIT accepts applications and awards grants to public and private entities located in Texas for the delivery of cancer prevention programs and services and for a wide variety of cancer-related research, with a significant emphasis on translational research and drug development. All CPRIT-funded projects must be conducted within the state by Texas-based companies, scientists, or prevention program providers and reflect CPRIT's mission to attract and expand the state's research capabilities and create high quality new jobs in Texas.

Cancer Impact in Texas

- 104,000 Texans diagnosed with cancer in 2010
- Cancer is the leading cause of death for Texans under 85
- Cancer cost Texas $25.3 billion in direct medical costs and morbidity and mortality losses in 2010

CPRIT'S FIRST 18 MONTHS

- 33 Requests for Applications released
- 1,800 proposals received
- 229 cancer research, commercialization and prevention projects funded
- Implemented gold-standard, nationally recognized review process to select projects to be funded
- $267.5 million awarded
- $400 million dedicated to cancer research, commercialization and prevention projects in Texas (including recipient matching funds)
- 55 Texas institutions, organizations and private companies are recipients of CPRIT funds
- Prevention projects directly affecting 85 percent of Texas counties

33 Requests for Proposals, 1,800+ Submissions, 229 Grants, $267 Million in CPRIT Funding

Beginning with its initial requests for proposals released in September 2009, the Institute issued 33 requests for grant proposals (15 for cancer research proposals; 13 for prevention proposals; and five for company commercialization proposals). The response was phenomenal with more than 1,800 submissions to the Institute from public and private entities across the state and from individuals and companies interested in relocating to Texas.

Matching Funds — CPRIT Grant Recipients Invest in Their Success

For every award it makes for a research or commercialization project, the Institute requires the recipient to certify that the institution, organization or company has its own funds also dedicated to the CPRIT project. The recipient's matching funds must equal at least one-half of the Institute's grant award and be spent on the same area of research or commercialization. Accounting for recipient matching funds, nearly $400 million has been specifically dedicated for CPRIT projects.

Since September 2009, the Institute has announced the award of 229 grants. Each of the CPRIT grant award announcements were presented to the Oversight Committee during public meetings. The research grant awards span the spectrum from basic science to translational research and clinical applications and vary in amount and duration from the relatively modest, short-term projects targeting early-stage ideas to the complex, multi-year research programs at laboratories and research facilities throughout the state. Significantly, CPRIT invested in seven private Texas-based companies with promising drugs, devices, and diagnostics in various stages of development. Complementing the research and commercialization portfolios, several different cancer prevention grant awards target unique projects and new partnerships, especially those employing novel methods to increase services provided, to increase early detection of cancer, and ultimately to increase survival rates. The impact of prevention program efforts spans the state.

These first 229 CPRIT awards, representing the very best cancer research, commercialization, and prevention projects in Texas, have set an ambitious course for the state over the next decade. The investment Texas is making today will advance the knowledge of the causes, prevention, and treatment of cancer, while also contributing to the research superiority and economic development of this state for years to come.

CPRIT's Fair and Impartial Review Process is Critical to Its Success

The Institute receives far more proposals than it has resources to fund. In determining which projects should be funded by CPRIT, the single most important criterion is impact — the potential to save lives and influence science. Does the proposal change the way other scientists think about and conduct their own research? Will it change the way physicians evaluate and treat their patients? Does it propose new and better ways to offer cancer prevention services that reach more Texans? Will the proposal ultimately decrease the burden of cancer in the state? Will the research project or company investment lead to a product, drug, or therapy that will help cancer patients?

To answer these questions and ensure that the best, most promising proposals are selected, CPRIT implemented an independent, impartial review process. All research, commercialization and prevention grant proposals are thoroughly evaluated and scored by cancer experts who have no vested interest in the funding of the project. This type of review is generally known as "peer review" because it is

conducted by the applicant's peers; that is, other scientists, clinicians, or experts operating independently (not associated with the applicant or the applicant's institution) in the same field. Peer review is a widely used and accepted method to provide an objective evaluation of the merits of a proposal, ensure scientific accountability, and eliminate bias.

CPRIT relied upon a bench of 150 reviewers selected for their expertise in cancer research, cancer prevention, and/or bioscience commercialization to perform more than 10,000 proposal evaluations (each proposal is reviewed by more than one reviewer and may be reviewed more than one time). No CPRIT employee participates in the scoring or review of any of the proposals. With the exception of a few experts specifically selected for their knowledge of the Texas bioscience commercialization community, all CPRIT reviewers live and work outside the state. Because CPRIT grant recipients must be located in Texas, the out-of-state reviewers are ineligible to receive a CPRIT award — minimizing the potential for regional bias and conflicts of interest in the review process. Each reviewer must certify that he or she does not stand to personally or professionally gain from the outcome of any review in which they participate.

CPRIT's peer review process has been nationally recognized and independently certified by the National Cancer Institute (NCI). The objectivity and impartiality of the CPRIT review process was a critical factor in CPRIT receiving the official designation as an NCI- Approved Funding Organization. CPRIT's NCI certification will be instrumental in leveraging additional federal funding for cancer research programs in Texas.

Selecting the Best of the Best

- Impact is most important criterion
- CPRIT's gold-standard review process is nationally recognized and independently certified as conforming to standards for fair and unbiased review
- 150 experts in cancer research, commercialization and prevention review applications and make funding recommendations
- 10,000+ separate reviews conducted
- Written conflict of interest policies enforced

CPRIT RESEARCH, COMMERCIALIZATION, AND PREVENTION PROJECTS

Top Ten Cancer Sites/Types
(by funding)

Breast	$40.4 million
Gastrointestinal	$31.7 million
Lung	$30.9 million
Gynecological	$28.8 million
Head and Neck	$26.3 million
Brain/Nervous System	$21.6 million
Childhood/Adolescent	$20.1 million
Prostate	$20.0 million
Blood	$18.6 million
Liver	$ 7.9 million

NOTE: Many CPRIT cancer research, commercialization and prevention projects address more than one cancer site. For example, a $1.2 million research project may target childhood leukemia. As a result, the entire amount would be reflected in both the Childhood/Adolescent and blood cancer categories. The figures reflected above do not include funding amounts for projects addressing "all cancer sites" or generally "multiple cancer sites" as reported by award recipients.

CPRIT'S RESEARCH INITIATIVE

Groundbreaking Discoveries Today

CPRIT Cancer Research Milestones

- 15 requests for research applications issued
- 1,500+ research applications submitted to CPRIT
- 100 Individual Investigator awards totaling $101.9 million
- 27 High Impact/High Risk awards totaling $5.2 million
- 8 Multi-Investigator collaboration awards totaling $56.4 million
- 10 CPRIT Scholars in Cancer Research recruited to Texas
- 7 Research Training Programs totaling $17.7 million
- 23 Texas institutions and organizations recipients of CPRIT research awards
- 500 new jobs added (200 already hired)

Texas is perfectly positioned to transform the discovery and development of new ideas into real results for patients. CPRIT's cancer research program encourages team science and collaborative endeavors, such as the development of a statewide clinical trials network. By promoting a non-competitive, team science concept that brings together multidisciplinary approaches (prevention, basic biology, clinical science, statistics, bioinformatics, computer science, imaging, etc.), CPRIT fosters statewide research collaborations with extraordinary potential.

The expanding field of personalized medicine provides significant opportunities for CPRIT-funded research as new genetic markers are identified with increasing frequency. By aligning information technology platforms that combine patient information and clinical research data, more opportunities develop for targeted intervention and new methods of care — ultimately expediting the transition of research from the bench to the bedside. For example, research into sequencing an individual's cancer genome will assist in identifying whether a patient is at risk for certain cancers or respond to a particular drug, and help the patient avoid treatments that will not work.

The state's diverse patient populations (urban, rural, poor, wealthy, various ethnicities) also provide an opportunity for comparative effectiveness research to inform patients, providers, and decision-makers about effective interventions for particular patients under specific circumstances.

Committed to Funding Only the Best of the Best

From its inception, CPRIT has distinguished itself from other funding agencies. This is evident in our willingness to share risk with excellent researchers if they are pursuing very worthy goals. Little of great importance is achieved without taking some risk, and the Institute is more willing than many other agencies to move beyond research projects that promise predictable outcomes resulting in only incremental progress.

"I don't think there's a greater legacy we can leave our children or grandchildren than providing research to cure cancer."

– Texas State Senator Jane Nelson

CPRIT's selection process is also distinctive because of the collective expertise of superior cancer scientists and practitioners on CPRIT's seven peer review committees that evaluate applications submitted to CPRIT for funding awards. CPRIT reviewers are asked to stress the potential impact of the work proposed to be funded and identify projects that will make a real difference if successful, rather than those that will add only marginal knowledge to a large existing base. CPRIT can boast of the best peer review committees in the world and is committed to following their counsel — free from political influences or conflicts of interest.

The seven peer review committees are chaired by an outstanding group of scientists, many of whom are members of the United States National Academy of Sciences, the Institute of Medicine of the National Academies, and the Howard Hughes Medical Institute. The seven committee chairs comprise CPRIT's Scientific Review Council, which is led by Dr. Philip Sharp, a distinguished faculty member

CPRIT'S CANCER RESEARCH AWARDS

CPRIT's research awards span the spectrum from basic science to translational research and clinical applications and vary in amount and duration from the relatively modest short-term projects targeting early-stage ideas to the complex, multi-year research programs at laboratories and research facilities throughout the state.

- Recruitment awards help to bring superior cancer researchers at different career stages to Texas academic institutions to establish laboratories and contribute to the research talent in the state. CPRIT funding for CPRIT Scholars in Cancer Research begins at $2 million for first-time, tenure-track faculty appointments, and may increase depending upon the career stage of the cancer researcher. These appointments are for four-year terms.
- High Impact-High Risk awards are designed as relatively inexpensive, short-term awards ($200,000 over 24 months) to give investigators seed money to explore especially exciting but risky approaches to cancer research.
- Individual Investigator awards support innovative research projects directed by one scientist addressing critically important questions that will significantly advance knowledge of the causes, prevention, and/or treatment of cancer. Awards may be up to $3 million over 3 years.
- Multi-Investigator awards fund large-scale, collaborative, cross-disciplinary research among several investigators for projects that cannot be effectively addressed by an individual researcher or a group of researchers within the same discipline. These are generally multi-million dollar projects that may last up to five years.
- Training awards sustain specialized cancer research training programs to promote the next generation of investigators and leaders in cancer research. Individuals from underrepresented racial and ethnic groups, individuals with disabilities, and individuals from disadvantaged backgrounds are especially encouraged to participate in CPRIT's training programs.
- Shared Instrumentation awards underwrite the acquisition of major research equipment and instruments at Texas research institutions whose purchase can be justified on a share-use basis among a group of investigators to support the goals of scientifically significant cancer research projects. Awards may be up to $4.2 million over five years.
- Core Facilities awards fund the development or enhancement of core facilities that will provide valuable services to enhance the outcomes of scientifically meritorious cancer research projects high-impact cancer studies. Awards may be up $6 million over five years.

at the Massachusetts Institute of Technology and recipient of a Nobel Prize in 1993. In addition to recommending research projects to be funded, the Scientific Review Council provides strategic guidance to the Institute.

Because CPRIT's priority is to elicit the best and most creative ideas from the finest cancer researchers in Texas, these talented scientists are not told what to work on nor are arbitrary quotas imposed on areas to be funded. There are no "set asides" for basic research, clinical research, or commercialization and no fixed amounts to be spent on, for example, pediatric oncology, epidemiology, or genetics. CPRIT does not allocate specific fractions of the budget for breast cancer, colon cancer, or lung cancer. Rather, broadly qualified expert review

"With our standards very high, the success rate for those seeking support from CPRIT has been quite low by conventional standards. The overall success rate for all 2010 research applications submitted to CPRIT (not including training and recruitment) was about nine percent. CPRIT is funding the best of the best."

–CPRIT

panels have been established that are capable of reviewing a wide range of proposals, and the best and the most promising, without regard to topic or cancer site, are selected. ***You are unlikely to solve problems, no matter how important, if you do not have good ideas about how to find solutions.*** CPRIT's strategy is to set the stage, let the best ideas come forth, and fund those. These principles have served CPRIT very well during its first 18 months of operations.

CPRIT RESEARCH GRANT RECIPIENT PROGRESS UPDATE HIGHLIGHTS

"The long-term goal of this work is to be able to sample a patient's lung cancer and perform molecular tests that can both predict how a patient will do and, more importantly, the best treatment for that individual.… If our approach works, it has the potential to revolutionize the prevention and treatment of breast and lung cancer in Texas and the USA."

–David J. Mangelsdorf, Ph.D.

David J. Mangelsdorf, Ph.D., UT Southwestern Medical Center at Dallas, Primary Investigator for a $4.6 million Multi-Investigator Research Award grant announced June 18, 2010

RP101251; *Development of Nuclear Receptor and Coregulator Profiles for Diagnostic and Therapeutic ("theranostic") Targeting of Breast and Lung Cancers*

Dr. Mangelsdorf's Project Overview: "Breast and lung cancers are the biggest cancer killers of men and women in Texas and the USA and new ways are needed to treat these cancers that are specific for individual patients. We want to "personalize" therapy by identifying molecular characteristics of tumors ("biomarkers") that tell us what the best therapy is for each patient. Our team focuses on a specific group of tumor biomarkers called "nuclear hormone receptors" (of which there are 48) and their "co-regulators" (of which there are over 100) because their mechanisms of action are known, and many already have FDA-approved drugs. An example is tamoxifen, a drug that inhibits the estrogen receptor and is in routine clinical use for breast cancer treatment. At present, there is no similar treatment for lung cancer. We want to use information on the expression of each tumor's nuclear receptor and coregulator profile to prevent and treat lung and breast cancers with hormonal therapy, in a manner tailored to the needs of each patient. Potential advantages are that such hormonal therapy will be much less toxic than currently available chemotherapy, and that this new hormonal therapy would greatly increase the efficacy of available chemotherapy. To do this we have assembled a world-class team of investigators in nuclear receptors, co-regulators, and breast and lung cancers who all work in Texas (at UT Southwestern Medical Center, Baylor College of Medicine, and UT M.D. Anderson Cancer Center). We will study the expression of nuclear receptors and co-regulators in a large number of breast and lung cancers and using this information, perform all of the preclinical studies to make this approach available for clinical trial testing in patients."

Dr. Mangelsdorf's Progress Update: In a paper recently published in PLoS Medicine, researchers reported the discovery of sets of genes active in cancer cells and normal tissue that predict survival time and potentially new types of treatment for patients with non-small cell lung cancer, including those with early-stage disease. UT Southwestern researchers and colleagues at UT M.D. Anderson Cancer Center microdissected lung tumors and adjacent healthy lung tissue from 30 patients in the study. To determine which genes were active, or expressed, they examined each sample for the presence of messenger RNA (mRNA) associated with the 48 known genes for molecules called nuclear hormone receptors.

The research team then compared the set of active genes, also called a gene expression profile or gene signature, with the actual clinical outcome of each study patient. They found that the expression of genes for specific nuclear hormone receptors was an excellent predictor of which patients were likely to survive the longest. They validated their test by screening more than 500 additional lung-tumor samples and accurately predicting those patients' outcomes.

The team focused on screening for the activity of these 48 nuclear receptor genes because several of them are known to be involved in promoting or inhibiting cancer. In addition, cancer therapies that target certain nuclear receptors already are being used in humans against breast cancer, prostate cancer and leukemia. The long-term goal of this work is to be able to sample a patient's lung cancer and perform molecular tests that can both predict how a patient will do and, more importantly, the best treatment for that individual. For this reason these results are believed to be a significant step forward in personalized medicine for cancer.

Charles P. Reynolds, M.D., Ph.D., Texas Tech University Health Sciences Center, recipient of a $1.2 million Individual Investigator award announced on June 18, 2010

RP100762; *Enhancing the Anti-Neuroblastoma Activity of Fenretinide by Identifying and Targeting Sphingolipid Pathways that Confer Resistance*

Dr. Reynolds' Project Overview: "High-risk neuroblastoma is a highly lethal childhood malignancy. We showed that intensive chemotherapy and stem cell transplant followed by a vitamin-A-like drug (13-cis-retinoic acid) improved survival for children with neuroblastoma, but many patients still eventually die from this disease. Our laboratory studies of fenretinide, another drug derived from vitamin A, have led to clinical trials that have demonstrated complete responses (i.e., patients entering study with tumors had no evidence of tumor after receiving fenretinide) in children with recurrent neuroblastoma. A national Phase III trial of fenretinide in high-risk neuroblastoma is planned in the Children's Oncology Group using our novel fenretinide formulation. Understanding the molecular basis of how cancer cells become resistant to fenretinide will inform future clinical trials. Our preliminary data point toward neuroblastoma cells overproducing sphingosine kinase as a means of resistance to fenretinide, and we have shown a new drug that can inhibit sphingosine kinase (safingol) and can overcome fenretinide resistance in cancer cells. This grant will support laboratory studies to understand the molecular basis of resistance to fenretinide, especially resistance caused by sphingosine kinase, and laboratory studies understanding the molecular action of safingol as an anti-neuroblastoma drug. The grant will also support the conduct of Phase I clinical trials of fenretinide + safingol (using our novel intravenous formulations for both drugs) initially in adults with cancer and then in children with neuroblastoma. As Phase I clinical trials of our novel intravenous formulation of fenretinide as a single drug in adults have also shown durable complete responses in T-cell lymphomas and activity in adult solid tumors, our proposed fenretinide + safingol laboratory studies and clinical trials will potentially benefit both adult and pediatric patients with a variety of cancers."

"In addition to these studies potentially benefiting cancer patients in Texas, rights to key issued patents on fenretinide and safingol have been licensed by CerRx, Inc., a new drug development company in Lubbock, TX, providing a path forward for commercialization from Texas of this novel form of chemotherapy."

–Charles P. Reynolds, MD, Ph.D.

Dr. Reynolds' Progress Update: The CPRIT grant has enabled Dr. Reynolds and colleagues at Texas Tech University Health Sciences Center to develop a phase I clinical protocol that will test the combination of intravenous fenretinide + safingol. Dr. David Gerber, Hematology/Oncology, Harold Simmons Cancer Center, UT Southwestern Medical Center in Dallas, was recruited as the protocol Study Chair. The clinical protocol, together with laboratory data on the anti-cancer activity and safety in animals of fenretinide + safingol, was filed to the FDA in November 2010, in an Investigational New Drug Application. The FDA approved the clinical protocol and is currently working with Drs. Maurer and Reynolds and the National Cancer Institute (NCI) to clarify routine details related to manufacturing safingol for clinical use (made for Drs. Maurer and Reynolds by the NCI via a RAID grant). They anticipate receiving safingol from the NCI by Spring 2011, at which time this exciting novel combination chemotherapy can be tested in patients via the South Plains Oncology Consortium (www.SPONC.org). The phase I clinical trial is supported by their CPRIT grant. In addition to these studies potentially benefiting cancer patients in Texas, rights to key issued patents on fenretinide and safingol have been licensed by CerRx, Inc., a new drug development company in Lubbock, Texas, providing a path forward for commercialization from Texas of this novel form of chemotherapy.

Sandeep Burma, Ph.D., UT Southwestern Medical Center at Dallas, recipient of an $857,000 Individual Investigator research award announced January 20, 2010

RP100644; *Impact of GBM-Specific Oncogenic Events on DNA Repair Pathways: Implications for Therapy*

"Our results open up the exciting possibility of treating PTEN-deficient Glioblastoma multiforme (about 40% of all GBMs) with novel PARP inhibitors."

–Sandeep Burma, Ph.D.

Dr. Burma's Project Overview: "Glioblastoma multiforme (GBM) is the most common and aggressive primary brain tumor in adults and is universally fatal due to a great degree of therapeutic resistance. Currently, the combination of radiation and the chemotherapy drug temozolomide is the only treatment regimen that has shown some therapeutic promise. In order to improve GBM therapy further, it is very important to understand how tumor cells respond to radiation and temozolomide. Both radiation and temozolomide kill tumor cells by inducing DNA double-strand breaks. Depending upon the DNA-damaging agent, DNA breaks are preferentially repaired by one of two major DNA repair pathways: non-homologous end joining or homologous recombination repair. We find that key genetic changes that promote the development of glioblastoma impact the proficiency of these two DNA repair pathways in very specific ways. These effects can have significant impact on how tumors respond to treatment. We propose to dissect these connections between GBM-specific oncogenic events and DNA repair pathways as this might uncover vulnerable nodes that can be targeted for therapy. Moreover, a more complete understanding of these relationships will help develop personalized treatment options based upon the status of these two DNA repair pathways in brain tumor cells."

Dr. Burma's Progress Update: "Our lab is trying to understand how genetic mutations in GBMs affect two DNA repair processes - non-homologous end joining (NHEJ) and homologous recombination repair (HRR). With funding from CPRIT, we are specifically focusing on a common genetic change in GBMs - loss of the PTEN gene. Our research shows that loss of PTEN renders tumor

cells incapable of repairing DNA breaks induced by temozolomide due to a defect in HRR. Importantly, the HRR defect of PTEN-deficient tumor cells also renders them vulnerable to PARP inhibitors. These are a new class of drugs that can be used to selectively kill tumor cells defective in HRR while sparing normal cells of the patient. These drugs have already shown great promise in treating breast and ovarian cancers with HRR defects due to other mutations. Our results open up the exciting possibility of treating PTEN-deficient GBMs (about 40%) with novel PARP inhibitors." *[This work was published in Cancer Research, McEllin et al, 70:5457-5464, 2010]*

Chengcheng Zhang, Ph.D., UT Southwestern Medical Center at Dallas, recipient of a $1.2 million Individual Investigator research award announced January 20, 2010

RP100402; *IGF Binding Protein 2 Supports the Activity of Acute Myeloid Leukemia Stem Cells*

Dr. Zhang's Project Overview: "We propose to study the regulation of the development of acute myeloid leukemia (AML) by a secreted protein, IGF Binding Protein 2 (IGFBP2). The role of IGFBP2 in acute myeloid leukemia (AML) and many other types of cancer is very intriguing. IGFBP2 can bind to insulin-like growth factor (IGF) ligands and displays IGF-dependent growth inhibitory effects on many cell types. By contrast, some of the growth-stimulatory effects of IGFBP2 have been shown to be independent of IGF signaling. IGFBP2 is capable of stimulating growth of certain cancer cells, and it is overexpressed in many cancer patients and in some cases its expression correlates with grade of malignancy. Based on clinical observations and our preliminary studies, we hypothesize that IGFBP2 supports the activity of AML stem cells (AML-SCs); the AML-promoting IGFBP2 may be produced by both bone marrow environment and AML-SCs. First, we will determine whether IGFBP2 is expressed in human AML-SCs and differentiated AML cells, and how this expression is related to AML development. We will also examine the IGFBP2 expression in human AML bone marrow environment, and apply the state-of-art imaging tools to study the dynamic relationship between AML-SCs and IGFBP2-producing stroma cells in the bone marrow. Furthermore, we will determine how IGFBP2 regulates the AML-SC activity by identifying the cellular mediator of IGFBP2 in AML-SCs in Aim 3."

Dr. Zhang's Progress Update: "We have established an AML mouse model and showed that IGFBP2 was expressed in normal blood cells, leukemia cells, and bone marrow stroma. IGFBP2-deficient mice have decreased ability to develop AML in their AML mouse model, suggesting that the environmental IGFBP2 positively supports AML development. Furthermore, the AML cells isolated from the primarily transplanted IGFBP2-deficient mice have decreased ability to develop AML in serial transplanted mice. Consistently, IGFBP2 upregulated the expression of a number of oncogenes, and decreased the expression of a number of tumor suppressor genes in AML stem cells. These results, together with our flow cytometry analysis of the phenotypic AML stem cells, indicate that IGFBP2 supports the activity of AML stem cells. Our study will likely significantly advance understanding of AML pathogenesis and pave the way for the development of novel strategies that treat human leukemia."

"Our study will likely significantly advance understanding of acute myeloid leukemia pathogenesis and pave the way for the development of novel strategies that treat human leukemia."

–Chengcheng Zhang, Ph.D.

Roberta Ness, M.D., MPH, University of Texas Health Science Center at Houston, recipient of a $2.6 million Research Training award announced June 18, 2010

RP101503; *Collaborative Training of a New Cadre of Innovative Cancer Prevention Researchers*

"Early results among a small number… of graduate students who completed the training show pre- to post-curricular scores on standardized tests of fluency, originality, and flexibility increased by 200-300%."

–Roberta Ness, M.D., MPH

Dr. Ness' Project Overview: Under the direction of an Executive Committee, the training program will mobilize research and training expertise from The University of Texas Health Science Center at Houston: School of Public Health (SPH), School of Biomedical Informatics (SBI), and Graduate School of Biomedical Sciences (GSBS), and UT M.D. Anderson Cancer Prevention Sciences; as well as innovative interdisciplinary research opportunities at the Institute for Molecular Medicine. Dr. Ness, SPH Dean, an innovative cancer epidemiologist, academic leader, and training director, will chair the Executive Committee, oversee mentor selection, monitor overall quality, and co-teach Innovative Thinking. Dr. Mullen, a behavioral scientist and highly successful NCI training director, will coordinate curriculum development, trainee recruitment and selection, and program evaluation. The program will enlist a broad portfolio of training methods, including coursework, workshops, Cancer Prevention Grand Rounds, and a wealth of research opportunities to prepare SPH and SBI predoctoral and postdoctoral fellows in core competencies, according to individualized training plans. Key elements of training program include:

- Training for trainees and mentors in innovative thinking skills supported by a training environment that encourages innovation. An evidence-based course is being piloted by Dr. Ness. Program leaders and mentors will provide incentives and reinforcement for innovation and interdisciplinary perspectives. Trainees' projects will be judged on the validity and accomplishment of design and the soundness and feasibility of approach and execution rather than on the certainty of positive or anticipated outcomes;
- Extension of the three schools' curricula with courses/workshops to demonstrate perspectives and methods of epidemiology and health promotional behavioral sciences, cognitive sciences and informatics, and biological sciences — facilitated by a new SPH cancer prevention concentration for UTHSC-H doctoral students (certificate for post-docs);
- Multifaceted mentoring for projects to support innovative approaches;
- Career skills development through courses and the Integrative Seminar that will bring together trainees, Program faculty and mentors focused on trainee proposal and paper development, discussions of journal articles selected to provoke creative, "outside-the-box" ideas, and integrated discussions to supplement courses in research ethics. We will also select undergraduates to participate in summer research internships based in the participating schools in Houston and at the SPH regional campuses in El Paso, San Antonio, Brownsville, Austin, and Dallas.

Dr. Ness' Progress Update: In her book, recently completed under the auspices of a CPRIT grant to The University of Texas Health Science Center at Houston, Dr. Ness has developed a model approach for teaching Innovative Thinking.

This conceptual approach has already been pilot tested among graduate students in the health sciences. The instructional model entails both generative and critical thinking. First, students learn to recognize and overcome habitual cognitive barriers to creative thinking. Second, they enhance generative fluency and originality. Third, they improve and apply powers of observation. Finally, they analyze and apply innovative solutions to problems in science. The dominant feature in the approach is the application of broadly applicable tools to domain-specific scientific problems. Early results among a small number (N=13) of graduate students who completed the training show pre- to post-curricular scores on standardized tests of fluency, originality, and flexibility increased by 200-300%.

James Brugarolas, M.D. Ph.D., UT Southwestern Medical Center at Dallas, recipient of a $1.2 million Individual Investigator research award announced June 18, 2010

RP101075; *Identification of a Novel Oncogene in Clear-Cell Renal Cell Carcinoma*

Dr. Brugarolas' Project Overview: "Over 55,000 individuals in the US are diagnosed with kidney cancer every year. In Texas, kidney cancer is the 6th most commonly diagnosed cancer type and the 4th among African Americans and Hispanics. While up until 2006 only one drug was approved by the FDA for kidney cancer treatment, advances in our understanding of the genetics and the biology of this disease have led to the development and approval of six new drugs. These advances resulted from the discovery of two abnormally regulated pathways/genes. However, despite the progress, metastatic kidney cancer is rarely curable. The identification of new genes deregulated in kidney cancer may lead to the development of new treatments. Based on other tumor types, it is estimated that there are approximately 15 critical genes/pathways deregulated in kidney cancer. We have undertaken several approaches to identify novel genes/pathways and the approach supported by this award mechanism involves the analysis of regions of DNA with recurrent abnormalities in the most common type of kidney cancer, clear-cell renal cell carcinoma. We have identified one such region and are evaluating each gene in the region using a variety of assays. Each gene is individually inactivated in kidney cancer cells in the laboratory and its effects on tumor cell growth are studied. In addition, candidate genes are also examined for their role in tumor formation in mice."

Dr. Brugarolas' Progress Update: "We have recently completed the first global analysis of genetic alterations in kidney cancer. This work establishes a compendium of genetic alterations in kidney cancer, implicated several novel pathways that may serve as drug targets, and set the foundation for the development of new treatments. Importantly, most of the pathways examined remained deregulated in kidney tumor samples that had been implanted into the kidneys of mice, suggesting that mice implanted with human tumor samples may serve as a model to test new drugs."

"It is our hope that the identification of new genes implicated in kidney cancer may furnish new targets for drug therapy and improve the outcomes of kidney cancer patients."

–James Brugarolas, M.D. Ph.D.

"Surprisingly, even 80 years after the discovery of glucose metabolism in cancer, almost nothing is known about what happens to the glucose after it enters the tumor. This makes it difficult to fully understand the implications of a positive PET scan, and impossible to know whether any of the metabolic pathways fed by glucose could be safely targeted to slow down tumor growth."

–A. Dean Sherry, Ph.D.; Ralph J. DeBerardinis, M.D., Ph.D.

A. Dean Sherry, Ph.D., UT Southwestern Medical Center at Dallas, Primary Investigator for a $2.7 million Multi-Investigator research award announced June 18, 2010;
Ralph J. DeBerardinis, M.D., Ph.D., UT Southwestern Medical Center at Dallas, recipient of a $200,000 High Impact/High Risk research award announced January 20, 2010

RP101243; *Hyperpolarized 13C tracers of cancer metabolism - Novel MRI and MRS Methods for Imaging Cancer Metabolism*

RP100437; *Can Glioblastoma Growth Be Suppressed By Targeting Glutamine Metabolism?*

Drs. Sherry and DeBerardinis' Project Overviews: "Aggressive tumors have an insatiable appetite for glucose. Our understanding of cancer metabolism has deep roots in biology and genetics but our ability to detect metabolism as it occurs in tumors without a biopsy is largely limited to positron emission tomography (PET) imaging of enhanced glucose uptake into tumors using 18F-fluorodeoxyglucose. This technique allows oncologists to distinguish between normal and cancerous tissue. We are fortunate to have two new technologies in Texas that could potentially revolutionize our ability to look inside cancer cells and image metabolism in specific pathways in cancer patients; these include a 7 Tesla human MRI scanner at UT Southwestern Medical Center and two dynamic nuclear polarization (DNP) devices, one at UT Southwestern Medical Center and one at UT M.D. Anderson Cancer Center. The powerful 7T MR scanner is capable of detecting molecules and dynamic processes never before detected in cancer patients and those discoveries will establish the basis for new biological hypotheses about how metabolism differs in tumors compared to normal healthy tissues. Our ultimate expectation is that we will discover unique biomarkers in tumors at high magnetic fields that will guide clinical decisions about the most appropriate therapy to be used to alter these metabolic changes in cancer cells. The very recently discovered DNP technology has the potential of providing real-time images of metabolic processes and pathways in tumors at unprecedented levels of sensitivity for following regression of cancer during therapy. Through this multi-investigator award mechanism, we will bring together experts in chemistry, physics, engineering, and medicine from across Texas to bring these latest technologies to the forefront of personalized cancer imaging."

Drs. Sherry and DeBerardinis' Progress Updates: "In two CPRIT-funded studies, we have begun to explore how glucose is used by aggressive brain tumors in humans and mice. In the human study, patients received an infusion of heavy isotope-labeled glucose on the day of their surgery to remove the tumor.

"Together, these studies represent the first successful efforts to define nutrient metabolism in the context of unperturbed tumor growth in live subjects. They lay a foundation for translational efforts to develop new therapeutic strategies based on tumor metabolism."

–A. Dean Sherry, Ph.D.; Ralph J. DeBerardinis, M.D., Ph.D.

A small piece of the resected tumor was analyzed using a method called nuclear magnetic resonance (NMR), which identifies metabolites carrying the isotopic label that originated in glucose. This technique allowed us to observe, for the first time, the precise metabolic pathways that contribute to glucose utilization, energy production and growth in live human brain tumors. In the other study, cells derived from these primary human tumors were implanted into the brains of laboratory mice and allowed to grow. When the mice became sick with large intracranial tumors, they were subjected to a protocol of labeled glucose infusion and NMR, similar to the human study. Once again, glucose metabolism in these mouse tumors could be traced out with a high degree of confidence. Strikingly, the metabolic pathways at work in the human tumors are largely conserved in the mice. We are now using the mouse model to determine the effects of "silencing" key aspects of metabolism on tumor growth and survival of the mice. Together, these studies represent the first successful efforts to define nutrient metabolism in the context of unperturbed tumor growth in live subjects. They lay a foundation for translational efforts to develop new therapeutic strategies based on tumor metabolism."

Bert W. O'Malley, M.D., Baylor College of Medicine, recipient of a $789,000 Individual Investigator research award announced January 20, 2010

RP100348; *Development of Small Molecule Inhibitors That Target the Oncogenic SRC-3 Coactivator and Their Characterization as Novel Anti-Cancer Agents*

Dr. O'Malley's Project Overview: "A group of proteins called coactivators (a class of molecules that regulate genes, and which were discovered first at the Baylor College of Medicine) are frequently overexpressed and 'oncogenic' in multiple human cancers. The most prominent coactivator is steroid receptor coactivator-3/amplified in breast cancer 1 (SRC-3/AIB1), a molecule studied extensively in our lab (>40 publications). The SRC-3 molecule acts as a 'master regulator' of most of the genes required for cell growth. Thus, it is a dangerous gene that drives relentless proliferation in many human cancers, including breast, pancreatic, lung, gastrointestinal, and prostate. Overexpression of SRC-3 is estimated to be involved in 322,000 new cancer cases and 91,000 cancer deaths every year. Given the fact that SRC-3-dependent cancers are frequently resistant to established chemotherapeutics, the development of small molecule inhibitors (SMIs) to inhibit SRC-3 function is critically important. Currently, no means exist to directly regulate SRC-3 concentration or activity. With our extensive background experience, we are in an excellent position to develop small molecule inhibitors (SMIs) of SRC-3 that can reduce SRC-3 proteins and activity. The work proposed herein represents a full scale effort to develop anticancer agents through a distinct mechanism of action — by directly targeting the oncogenic coactivator SRC-3. Our results provide a novel and important approach to intervention for the many human cancers that utilize overexpression of SRC-3 for oncogenesis."

"This project represents a new pharmacology, involving drugs to control a class of regulator molecules (coactivators) that has only recently been discovered and for which no drugs exist at present. The project has major implications for a new type of therapy for cancers."

–Bert W. O'Malley, M.D.

"With this approach we have already identified several novel metastases suppressor genes for osteosarcoma, which are part of a signaling pathway which may be druggable and lead to successful therapeutic interventions for metastatic osteosarcoma.… The structure of this program will allow for a "bench to bedside" approach to developing novel therapies and has the potential to advance the field of OS research and improve the lives of teenagers and young adults affected by this disease."

–Lawrence Donehower, Ph.D.

Dr. O'Malley's Progress Update: Dr. O'Malley originally applied to traditional sources for funding to discover chemical inhibitors of SRC-3. The National Institutes of Health (NIH) and pharmaceutical companies turned him down because his project was considered to be too risky. No inhibitor of this type of molecule had ever been discovered. However, Dr. O'Malley received a CPRIT grant, and with the CPRIT money he was able to initiate the project, and indeed has come up with some new and surprising chemical inhibitors of this oncogene over just the first year of the program. The results to date indicate that the project is feasible. Now, NIH is interested in helping, and will do large scale screening for more chemical inhibitors of SRC-3 in their facility at the Scripps Institute. Also, Eli Lilly Pharmaceutical Co. has seen the data and is in the process of instituting a formal collaboration with the O'Malley lab and Baylor College of Medicine to search for drugs on a large scale that will regulate coactivators, especially for cancer. This project represents a new pharmacology, involving drugs to control a class of regulator molecules (coactivators) that has only recently been discovered and for which no drugs exist at present. The project has major implications for a new type of therapy for cancers.

Lawrence Donehower Ph.D., Baylor College of Medicine, Co-Primary Investigator for a $3.6 million Multi-Investigator research award announced June 18, 2010

RP101335; *Utilization of Novel Mouse Models to Provide Insights into Molecular Mechanisms of Metastatic Osteosarcoma [Targeted Therapies for Metastatic Osteosarcoma]*

Dr. Donehower's Project Overview: "The goal of our multi-investigator translational research program is to improve the lives of patients with metastatic osteosarcoma (OS) through the development of novel targeted therapies. Metastatic OS is one of the most difficult pediatric solid tumors to treat. The outcome of patients with metastatic OS has not changed over the last two decades, and most patients will die of their disease. Thus there is a great need to develop new therapies, based on a better understanding of the biology and metastatic behavior of OS. Our research program meets this challenge by integrating researchers in Texas who represent a diverse group of clinicians and scientists with expertise in pediatric oncology, molecular biology, genomics, proteomics, immunotherapy, and animal cancer models. The funded research program consists of three projects. The first project aims to better understand which genes and pathways are involved in the metastatic behavior of OS. The second project will develop tests which can be used to identify metastatic OS patients at an early stage so that they can be treated more aggressively. The third project proposes to develop an effective immunotherapy for metastatic OS by genetically re-engineering the patient's own immune system to fight the specific cancer. These projects are supported by Research Cores, which will facilitate close interactions and collaborations between all investigators. The structure of this program will allow for a "bench to bedside" approach to developing novel therapies and has the potential to advance the field of OS research and improve the lives of teenagers and young adults affected by this disease."

Dr. Donehower's Progress Update: "We have developed mouse models of osteogenic sarcoma based on either deletion of an important tumor suppressor gene (p53) or activation of a mutant copy of the gene only in osteoblasts of the mouse. The mice usually develop either localized non-metastatic osteosarcomas or metastatic osteosarcomas, depending on the gene change that was made. It is very useful to be able to compare gene expression in metastatic versus non-metastatic OS because the single most important prognostic marker for OS in humans is whether it is localized or metastatic at first presentation. With this approach we have already identified several novel metastases suppressor genes for osteosarcoma, which are part of a signaling pathway which may be druggable and lead to successful therapeutic interventions for metastatic osteosarcoma."

"The structure of this program will allow for a "bench to bedside" approach to developing novel therapies and has the potential to advance the field of OS research and improve the lives of teenagers and young adults affected by this disease."

–Lawrence Donehower, Ph.D.

CPRIT RESEARCH PROGRAM SPOTLIGHT

CPRIT Scholars in Cancer Research — Establishing a Legacy of Talent

To conduct the best science, Texas needs the best scientists. Consistent with its mission to augment the state's cancer research superiority, CPRIT has started an ambitious program to attract top talent to Texas in both the academic and private industry sectors. The *CPRIT Scholars in Cancer Research* program recruits exceptional scientists and practitioners from outside the state to join Texas universities and cancer research institutions.

CPRIT successfully recruited ten scholars who are the best in their field to Texas from preeminent institutions such as the University of Chicago, Harvard University, Massachusetts Institute of Technology, Duke University, Stanford University, Vanderbilt University, and Johns Hopkins University. The presence of these preeminent researchers in Texas will also serve to attract other scientists and industry eager to collaborate with others working on the cutting edge of cancer research. It is estimated that these ten CPRIT Scholars will attract an additional $20 million in extramural funding to the state each year throughout their careers in Texas.

Similarly, the Institute created a program to recruit industry partners with a proven record of commercialization in the field of cancer. The goal of this program is to encourage the creation of new Texas-based companies and to persuade out-of-state companies to relocate to Texas. By targeting exceptionally qualified companies, the Institute advances both economic development and cancer care efforts in the state. Stimulating the development of a strong bioscience industry in Texas will also increase the number of high-quality jobs statewide.

The Institute supports the development and training of the next generation of highly qualified cancer biology researchers through its CPRIT Research Training grant awards. In its first year, the Institute awarded grants to seven training programs at institutions across the state. These training programs are instrumental in ensuring that a diverse pool of exceptionally trained scientists is available to continue the important work in emerging cancer research fields. CPRIT's Research Training awards include a special focus on underrepresented racial and ethnic groups, individuals with disabilities, and individuals from disadvantaged backgrounds.

CPRIT is Committed to Recruiting and Training Top Talent in Texas

- 10 *CPRIT Scholars in Cancer Research* recruited to 6 Texas institutions
- CPRIT Scholars projected to attract $20 million in additional funding to Texas each year
- 7 Cancer Research Training Programs created or supported across the state

CPRIT SCHOLAR IN CANCER RESEARCH GRANT RECIPIENT HIGHLIGHTS

Ralf Kittler, Ph.D., UT Southwestern Medical Center at Dallas, recipient of a $2 million First-Time, Tenure Track recruitment award announced November 18, 2009

Dr. Ralf Kittler received his Ph.D. degree from the Dresden University of Technology and the Max Planck Institute for Molecular Cell Biology and Genetics in Germany before completing a postdoctoral fellowship in genomics and cancer biology at the Institute for Genomics and Systems Biology of the University of Chicago. He joined the UT Southwestern Medical Center faculty early in 2010 as an Assistant Professor in the Eugene McDermott Center for Human Growth and Development.

His scientific interests and expertise focus on defining regulatory pathways contributing to the development and maintenance of tumors, particularly hormonally-responsive tumors such as breast cancer and prostate cancer. As a graduate student at the Max Planck Institute, Dr. Kittler worked in the laboratory of Dr. Frank Buchholz. In the Buchholz laboratory, Dr. Kittler developed a specific and highly efficient method (using RNA interference) to inactivate genes in cultured human cells. He used this technique to identify new genes and pathways that are essential for progression through the cell division cycle. This work was recognized by the Max Plank Society with the Otto Hahn Medal. He then moved to the laboratory of Dr. Kevin White at the University of Chicago. As a postdoctoral fellow his goal was to identify genes that were activated in response to hormonal signaling in breast cancer cells. To this end, he generated a genome-wide map of the binding sites for 24 nuclear hormone receptors; these hormones and their receptors act by altering the expression of critical genes. He found that vitamin A derivatives inhibited the stimulatory effects of estrogen on breast cancer cell growth.

Now that he has moved to UT Southwestern Medical Center, Dr. Kittler's goal is to discover new targets that can be used for the detection, staging and treatment of prostate cancer. He is taking advantage of a recent discovery that fusion of genes that control gene expression (by encoding transcription factors) are common in prostate cancer, and he will identify the transcriptional targets of these factors and modulators of their activity. In addition to this project, he will collaborate with Drs. John Minna and David Mangelsdorf to characterize the nuclear hormone transcription profile in lung cancer, with a goal of developing new strategies to detect and treat this common and deadly disease.

Dmitri Ivanov, Ph.D., University of Texas Health Science Center at San Antonio, recipient of a $2 million First-Time, Tenure Track recruitment award announced January 20, 2010

Dr. Dmitri Ivanov is a structural biochemist whose work on physical interactions at protein interfaces has already had a significant influence on our thinking about therapeutic approaches to two of the deadliest problems facing mankind — AIDS and cancer. He was recruited from Harvard Medical School in early 2010 to the Department of Biochemistry at The University of Texas Health Science Center at San Antonio (UTHSCSA). Dr. Ivanov, a native of Russia, began his undergraduate education in Physics at St. Petersburg State University. However, his strong affinity for understanding biological processes led him to complete his Bachelor's studies at Northeastern University in Boston, where he conducted research on carbon monoxide binding to myoglobin in the laboratory of Dr. Paul Champion. He subsequently earned his Ph.D. at Brandeis University in the laboratory of one of the pioneers of nuclear magnetic resonance (NMR) and a member of the National Academy of Sciences, Dr. Alfred Redfield. At Brandeis, Dmitri utilized his exceptional training in Physics to develop a novel "field-cycling" NMR method to study previously inaccessible quadrupolar nuclei (such as Zn, Mg, O and B) in biological macromolecules. He then built an instrument to use this technique to investigate the binding of a specific class of protease inhibitors containing boron, the birth of his ongoing interest in developing new drug therapies.

As a postdoctoral fellow in the laboratory of Dr. Gerhard Wagner at Harvard Medical School, Dr. Ivanov turned his attention to one of the pre-eminent health problems at the time — HIV infection and AIDS. His research shed light on the enigmatic function of the major homology region — the most conserved sequence element within the retroviral Gag polyprotein that forms the virus coat — and suggested a "domain swapping" model for coat assembly. Defining the structural basis of this assembly offers a unique avenue for the development of HIV therapies that may avoid the tendency of this virus to mutate. At Harvard, Dr. Ivanov's research achievements were recognized by a scholar award from the Harvard Center for AIDS Research and two individual grants from the National Institutes of Health.

Dr. Ivanov's research program at the UTHSCSA will use his expertise in protein-protein and protein-small molecule interactions to address one of the major challenges and opportunities of molecular pharmacology: inhibition of protein-protein interactions for therapeutic purposes. Particular emphasis will be on the identification, characterization, and targeting of critical macromolecular interactions involved in DNA damage sensing and repair. Inhibitors of DNA repair may expand the therapeutic window of very widely used anti-cancer drugs like cisplatin that work by causing DNA damage in rapidly dividing cells of tumors. The utility of these drugs is limited both by their toxicity to normal cells and by acquired resistance as cancer cells develop more effective DNA repair machinery. Targeting the assembly of the repair machinery at the outset should dramatically enhance the efficacy of these drugs. The structural and biophysical characterization of the key protein interactions in DNA repair in Dr. Ivanov's lab should identify how they could potentially be disrupted by pharmacological means.

CPRIT RESEARCH PROGRAM GRANT RECIPIENT SPOTLIGHT

CTNeT

STATEWIDE CLINICAL TRIALS NETWORK OF TEXAS

CTNeT received CPRIT's largest award to date, a $25 million Multi-Investigator research award announced June 18, 2010.

CTNeT's Vision and Mission Statement

Participation in clinical research inevitably improves the standard of care for all patients. An Institute of Medicine (IOM) report issued in April, 2010 concluded that the infrastructure supporting cooperative NCI-funded research is wrought with inefficiencies and delays hampering its ability to rapidly test new ideas and innovative research strategies. The Statewide Clinical Research Trials Network (CTNeT) is a non-profit oncology research initiative that will be responsive to the vision and overarching recommendations of the IOM to guide improvements to a cancer clinical trials model that will deliver an effective system across the state of Texas. Our vision is that every Texan living with cancer will one day be able to gain local access to cutting edge and personalized cancer treatments without barriers of geography, language, ethnicity or finance. We recognize that these goals are not insignificant and success will take an unparalleled commitment.

CTNeT's Key Objectives

- Establish governance, oversight, advisory boards and committees enabling Texas' academic institutions and community-based practices to work together to develop and conduct new therapeutic studies, focused on broader and more representative accrual of patients.
- Conduct tissue-based, biomarker-driven studies with novel targeted agents and innovative statistical designs. CTNeT's focus on personalized medicine and biomarker-driven studies will be significantly enhanced by close interactions with the CPRIT-funded specimen biorepository, directed by Dr. Richard Gibbs, and the creation of a new, CLIA certified, Cancer Genetics Laboratory (CGL), directed by Dr. Art Beaudet; both the biorepostiory and CGL are housed at the Baylor College of Medicine (BCM) and will have grant sub-awards.
- Develop a Coordinating Center to provide essential and centralized administrative, regulatory, legal, financial, pharmacy, and informatics components.
- Provide for an expedited protocol review process that enables rapid feedback on solicited clinical trial concepts, centralize Institutional Review Board review to eliminate redundant reviews at each institution and utilize standard "master" clinical trial contractual agreements and protocol templates.
- Define a near- and long-term informatics strategy to establish a unified technology platform for performing trials, collecting data and intergroup communication.
- Create a metric-driven decision-support system that reviews, reports and refines the efficiency and effectiveness of the model.

CTNeT Founding Institutions and Organizations

- Baylor College of Medicine - Dan L. Duncan Cancer Center (Houston)
- The Cancer Therapy & Research Center at The University of Texas Health Science Center at San Antonio (San Antonio)
- The Center for Cancer and Blood Disorders (Fort Worth)
- Mary Crowley Cancer Research Center (Dallas)
- The START Center for Cancer Care (San Antonio)
- Texas A&M/Scott & White Hospital System (Temple)
- Texas Children's Cancer Center (Houston)
- Texas Oncology (Austin, Fort Worth, and Tyler)
- Texas Society of Medical Oncology — Oncology Consultants (Houston sites)
- Texas Tech University Health Sciences Center School of Medicine Cancer Center (Lubbock)
- The University of Texas MD Anderson Cancer Center (Houston)
- The University of Texas Southwestern Medical Center (Dallas)

CPRIT'S COMMERCIALIZATION INITIATIVE

Accelerating Drug Development, Creating Jobs, Returning Investment to Texas

Because groundbreaking science is most valuable when it can be translated into products that are available to patients, a crucial component of CPRIT's mission is to create and support programs that accelerate the progression of new cancer drugs, diagnostics, and therapies from the laboratory to the patient. The Institute's ability to promote commercialization pathways distinguishes it from more traditional cancer research funding sources.

Commercializing cancer research benefits Texans in a variety of ways, including the introduction of new products; the creation of new, highly skilled jobs; increased economic activity; enhanced state revenues; and reduced health care costs and lost productivity. CPRIT dedicates personnel and operational funding to major commercial initiatives like the creation of the Commercialization Review Council and the recruitment of a virtual management company.

In its first year of operations, CPRIT invested $32 million in cancer research and commercialization projects at seven Texas-based companies. The CPRIT company projects include promising drugs, diagnostics, and devices specifically targeting certain cancers. The seven CPRIT company projects are expected to create 210 highly-skilled jobs in Texas. By engaging the business community in CPRIT's commercialization efforts, Texas will see a return on its invested cancer research dollars, while also enhancing opportunities for breakthrough cancer-related technologies.

These CPRIT-funded company projects were selected from a field of more than 100 company applicants based upon scientific merit and significant commercialization potential. In addition to the peer review process all CPRIT applications undergo, successful company cancer research proposals are subjected to a thorough due diligence analysis to determine whether there is a viable commercial path for the prospective discovery. The commercialization review ensures that CPRIT is investing in research with strong scientific merit that has the highest probability of reaching and benefiting people and producing a return on Texas' investment.

CPRIT will judge the success of its commercialization operations plan by its ability to generate commercialization opportunities from academic research and private sector company proposals, to proactively engage industry — both internal and external to Texas — and to support large collaborative projects like a state-based clinical trials network, biorepository, and a drug development network. These are ambitious goals, but the State of Texas is perfectly positioned to take on this challenge. CPRIT will continue to seek the input of all stakeholders in order to ensure that Texas implements the best policy for initiatives like increasing efficiency in drug development, improving drug efficacy and enabling clinical trials focused on personalized medicine.

"Texans should expect to receive a return on the substantial outlay for cancer research, both through increased economic development and a direct revenue stream from the commercial activities of CPRIT-funded research."

–CPRIT

CPRIT Commercialization Milestones

- More than 100 company applications for CPRIT funding
- $32 million invested
- 7 Texas-based companies
- 2010 investments projected to create 210 jobs in Texas
- Potential return on 2010 investment is $40 million

CPRIT'S COMMERCIALIZATION INITIATIVE CONTINUED

"By engaging the business community in CPRIT's commercialization efforts, Texas will see a return on its invested cancer research dollars, while also enhancing opportunities for breakthrough cancer-related technologies." –CPRIT

CPRIT'S CANCER COMMERCIALIZATION AWARDS

CPRIT's commercialization awards are designed to find and fund innovative companies already in the state or willing to relocate to Texas to develop promising new therapies and to build and sustain the state's life sciences infrastructure. Eligible stages of development for these commercialization awards include translational research, proof-of-concept studies, preclinical studies, and Phase I or Phase II clinical trials. By exception, Phase III clinical trials and later stage commercialization projects will be considered where circumstances warrant CPRIT investment.

- Company Commercialization awards support development of commercially-oriented products or services (e.g. therapeutics like small molecules and biologics, diagnostics, devices, and potential breakthrough technologies, including software and research discovery techniques) that will eventually be approved for the diagnosis, prevention, or treatment of cancer. These companies must be Texas-based or be willing to relocate to and remain in Texas for a specified period upon funding. No limit on amount; funding is milestone driven.
- Company Relocation awards were created to attract industry partners in the field of cancer care to advance economic development and cancer care efforts in the state by recruiting to Texas companies with proven management teams who are focused on exceptional product opportunities to improve cancer care. To be eligible for the award, company applicants must presently be domiciled outside Texas, and the majority of the staff, including C-level executives, must be willing to relocate to and remain in Texas for a specified period upon funding. This is a three-year funding program with an opportunity for renewal after the term expires. No limit on amount; funding is milestone driven.
- Company Formation awards help fund the formation and establishment of new start-up companies (no previous rounds of professional institutional investment) in Texas that will develop products to significantly impact cancer care. These companies must be Texas-based or be willing to relocate to and remain in Texas for a specified period upon funding and must commit to headquartering and registration in Texas with the majority of staff residing in Texas. This is a three-year funding program with an opportunity for renewal after the term expires. No limit on amount; funding is milestone driven.

CPRIT's Return on Investment — Intellectual Property and Revenue Sharing

Every CPRIT award includes an intellectual property agreement that specifies the revenue return to the state resulting from the successful development of the CPRIT-funded drug, device, diagnostic or service. CPRIT's intellectual property agreement is designed to promote the efficient and diligent commercialization of diagnostics and therapeutics into new products that benefit Texans. Highlights of the intellectual property/revenue sharing agreement include:

- CPRIT's revenue sharing standards balance a return on Texas' investment without impeding the ability to attract future commercial ventures.
- CPRIT can leverage its unique position by designing a fully-developed commercialization product development plan for exceptional CPRIT-funded projects.
- CPRIT has a seat at the table. Like any interested investor, CPRIT is an engaged partner in commercialization efforts to transition discoveries into commercially-available products, prevention measures, diagnostics, and treatments. CPRIT can help bridge the gap between early stage discoveries and product development with additional resources.
- Commercialization planning and prompt reporting facilitates accountability. As part of its responsibilities as owner of the intellectual property, the recipient must plan for commercialization opportunities and regularly update CPRIT on the progress being made related to important milestones.
- CPRIT research will serve as the catalyst for future scientific breakthroughs and commercial efforts. The state's investment in cancer research will continue to pay dividends through additional breakthroughs and commercial efforts for activities that are not directly funded by CPRIT.

CPRIT's Company Commercialization Program Spotlight

Apollo Endosurgery – $5 Million award announced June 18, 2010
Company location: Austin
Product Description: Device
Focus: Colorectal cancer

Project Overview: The CPRIT award will fund the commercialization of Apollo's SuMO™ System comprised of flexible surgery devices focused on cancers of the gastrointestinal tract. These cancers represent the second most common cause of cancer death in the United States. SuMO, which stands for Sub-Mucosal Operation, was developed through a partnership between Apollo Endosurgery and the Mayo Clinic, Johns Hopkins University, the Medical University of South Carolina, and The University of Texas Medical Branch at Galveston. The SuMO system utilizes a flexible endoscope to deliver specialized surgical tools to suspected lesions in the gastrointestinal tract via natural orifices, avoiding the trauma and pain associated with standard surgery. In preclinical proof-of-concept studies, gastrointestinal tissue up to seven centimeters in diameter has been removed en bloc endoscopically.

Why CPRIT Funding is Important: This CPRIT award speaks to the exciting potential of Apollo's flexible surgical tools to significantly improve therapy for cancers of the gastrointestinal tract. More importantly, the CPRIT funding will enable this exciting technology to move from the research lab to the bedside, to the benefit of Texans and patients worldwide.

SuMO represents a huge leap in therapeutic options for cancers of the gastrointestinal tract. The ability to easily remove neoplasms endoscopically will significantly improve the treatment options for these patients.

Apollo Endosurgery, Inc. is dedicated to revolutionizing patient care through the development of flexible surgery, which is emerging from the convergence of laparoscopic surgery and therapeutic gastroenterology. Flexible surgery minimizes the trauma of surgical access by taking advantage of natural orifices to deliver surgical tools to targeted areas.

Apollo Endosurgery was cofounded with the Apollo Group, a unique collaboration of physicians from the Mayo Clinic, Johns Hopkins University, Medical University of South Carolina, The University of Texas Medical Branch at Galveston and the Chinese University of Hong Kong.

"These commercialization awards provided by CPRIT clearly establish Texas as the top state to start and grow new companies in the field of cancer therapy and diagnostics."

–Dennis McWilliams, CEO and President, Apollo Endosurgery

Mirna Therapeutics, Inc. – $10.3 million company commercialization award announced June 18, 2010
Company Location: Austin
Product Description: Drug
Area of Interest: Tumors in lung, breast, prostate and colon cancer

"We are trying to bring back a critical activity that cancer cells are missing and by doing that — stop cancer from growing and from developing and metastasizing."

–Paul Lammers, M.D.

Project Overview: Mirna Therapeutics, Inc. (Mirna) is a discovery-stage biotechnology research and development company focused on microRNA-directed oncology therapies. MicroRNAs (miRNAs) are approximately 21 nucleotides long and affect gene expression by interacting with messenger RNAs. Misregulation of miRNAs appears to play a fundamental role in many cancers and unique miRNA profiles have been identified that are useful for diagnosis of certain cancer types. Mirna's lead cancer programs feature "MicroRNA Replacement Therapy" which involves introducing tumor suppressor miRNAs into cancer cells to induce cell death and tumor shrinkage. The company has a substantial body of pending intellectual property around miRNAs developed by its own scientists as well as in-licensed from other institutions. Oncology-directed miRNAs include those that are key tumor suppressors in cancer, such as miR-34 and let-7 that have proven to block tumor growth in a number of different pre-clinical animal studies. Mirna has entered into an exclusive license agreement with Yale University for the therapeutic use of let-7, and its intellectual property portfolio contains more than 300 miRNAs with applications in oncology and other diseases, including, but not limited to, inflammatory, cardiovascular, ophthalmic, metabolic, neurological and infectious diseases. In addition, Mirna has active collaborations with both the The University of Texas M.D. Anderson Cancer Center and UT Austin in the microRNA therapeutics field. Mirna currently has eight lead microRNA candidates directed against the treatment of tumors in lung, breast, prostate and colon cancers.

Why CPRIT Funding is Important: With the CPRIT investment, Mirna will, upon further optimization of its microRNA candidates and their systemic delivery, begin Phase 1 clinical trials. Mirna currently has 12 full time employees with a target of expanding to 20 technical and support employees by fall 2011.

"We are pleased to have been recommended for a significant $10.3 million award from CPRIT for advancing our strong microRNA mimic discovery platform and a pipeline with several very promising drug candidates for the treatment of cancer. We are especially pleased to receive this notice given the rigorous review of the science and business opportunity by the CPRIT Commercialization Review Council whose members have substantial scientific, venture capital, and commercial expertise."

–Paul Lammers, M.D., President and CEO, Mirna Therapeutics

Rules-Based Medicine – $3 million company commercialization award announced June 18, 2010
Location: Austin
Product Description: Cancer Diagnostic
Area of Interest: Profiling oncological immunoassays and biomarkers

Project Overview: Rules-Based Medicine® (RBM), the world's leading multiplexed biomarker testing laboratory, provides comprehensive protein biomarker products and services based on its Multi-Analyte Profiling (MAP) technology platform. RBM's biomarker testing service provides pre-clinical and clinical researchers with reproducible, quantitative, multiplexed immunoassay data for hundreds of proteins in a cost-effective manner, from a small sample volume and from multiple species. RBM is CLIA certified and supports GLP studies.

Most diseases and drug effects manifest themselves in abnormal levels of specific biomarkers found in the peripheral blood. By providing multiplexed, quantitative, and reproducible tests for hundreds of biomarkers, RBM enables research that historically was not available due to sample volume requirements and associated costs. Use of our testing services can help determine the sources of both the positive and negative effects of drugs during pre-clinical research and clinical trials. Biomarker testing results identify patients most likely to respond to a given therapy and the biochemical reason for that response, making clinical trials more successful and effective.

Why CPRIT Funding is Important: Over the next few years, RBM will use CPRIT funding to expand OncologyMAP by over 150 new cancer-related biomarker assays. RBM's OncologyMAP™ program results from the collaboration with the Proteomics Initiative of the National Cancer Institute. The first version of OncologyMAP, released in the fall of 2010, contains 102 quantitative immunoassays for "cancer-related" bloodbased biomarkers. It is the only available method to quickly, accurately, and cost-effectively quantify all of these important oncology biomarkers from a small amount of biological material. Biomarker patterns discovered in the blood or tissue can serve as diagnostic tests for early detection of tumors when therapeutic intervention is more successful or as prognostic tests that provide physicians with information to design treatment protocols. Biomarker patterns can also serve as companion diagnostics, distinguishing those who will benefit most from a specific therapy regimen. RBM also performs custom assay development, participates in co-sponsored research programs, and pursues in-licensing of novel high-value assays. RBM employs over 145 people at three facilities in Austin (Corporate headquarters and CLIA-certified biomarker testing laboratory), Lake Placid, New York, and Reutlingen, Germany.

"The activity of protein biomarkers in the blood can hopefully be a significant part in the breaking the code on some of these cancers."

–Craig Benson, President and CEO of Rules-Based Medicine

"Better cancer outcomes begin with more accurate and earlier detection."

–Karri Ballard, Ph.D., Director of Diagnostics Initiatives, Rules-Based Medicine

Damascus Pharmaceuticals, Inc.,
$11 million company formation award announced June 18, 2010
Location: Dallas
Product Description: Drug Development
Area of Interest: Becoming leading oncology company

Company Overview: Damascus aims to become a leading oncology company through the discovery and development of superior therapeutics, delivering extraordinary value to its employees, investors, and ultimately, cancer patients.

The Company will initiate efforts with three cutting edge small molecule discovery programs, sourced from top investigators at The University of Texas Southwestern Medical Center, including Dr. Steven McKnight, a world-recognized leader in the area of gene regulation. Each of these programs represents a unique approach to cancer therapy, from blocking the tumor's critical need for adaptation to a limited oxygen supply to poisoning its ability to self-renew and proliferate by shutting off key metabolic pathways and cancer stem cell compartments.

Despite the promise of these approaches, the challenge of drug discovery necessitates a multiple "shots-on-goal" approach. To that end, Damascus will continually replenish its discovery pipeline by in-licensing one or more compelling new programs each year from the UT Southwestern Medical Center and other leading institutions. This approach enables pipeline building and diversification without the delay, cost, and technology risk associated with more "conventional" biotech platforms. Furthermore, the Company will focus its resources on medicinal chemistry, rigorous pharmacology, IND-enabling pre-clinical toxicology, and eventual clinical development, leveraging the expertise in biology and high throughout screening capabilities of academic scientists.

Damascus plans to initiate research efforts in 2011 with two or more "founding" programs in oncology. Current program candidates include: (1) Inhibitors of Hypoxia-inducible Factor; (2) Wnt and Hedgehog (Hh) pathway antagonists; and (3) a platform for the identification of novel drug-target combinations aimed at unique molecular vulnerabilities in non-small cell lung cancer. Several additional programs at an earlier stage of discovery are also being evaluated, comprising a project "bullpen" for the company.

CPRIT'S PREVENTION INITIATIVE

Saving Lives, Saving Money, Reaching Texans

Ten percent of the total amount of money CPRIT awards each year is specifically devoted to supporting cancer prevention programs and services in Texas. CPRIT's prevention grant awards make it possible for proven cancer prevention strategies and early detection services to reach many more Texans and ultimately decrease the personal and economic burden of cancer statewide.

To tackle the diverse and often complex cancer prevention and control needs of the state, CPRIT-funded initiatives must be results oriented, evidence-based, non-duplicative, and innovative in delivery. Since September 2009, CPRIT has invested $32.8 million in 66 prevention projects in Texas that will have a measurable impact on public health in areas of the state in greatest need. The prevention grants program addresses all areas of the cancer prevention continuum, including:

- Primary prevention efforts, such as vaccine-conferred immunity, healthy lifestyle and anti-obesity initiatives, tobacco control, and sun protection; and
- Early detection, screening, and diagnostic services for cancers that we know can be prevented or detected early, with a priority for screening breast, cervical, and colorectal cancers; and
- Survivorship issues, including physical rehabilitation and therapy, psychosocial interventions, navigation services, and palliative care.

There is no question that we know how to prevent some cancers (*e.g.,* through smoking prevention and cessation and vaccinating against Human Papillomavirus) and how to reduce the risk of getting others. We also know that early detection, through recommended cancer screenings, can save lives. The ability to reduce cancer death rates in the state depends in part on applying some of these current approaches more broadly. There are effective evidence-based strategies available now that are not reaching all Texans. Through its prevention grants program, CPRIT invests in building and improving the capacity of communities to deliver effective interventions so that new technologies and services are made available to more Texans.

CPRIT Prevention Milestones

- 66 Prevention Projects
- $32.8 million in prevention awards
- 37 Texas political subdivisions, institutions, and organizations received CPRIT prevention awards
- 85% of Texas counties directly impacted by region-specific prevention programs
- Reaching more than two million Texans with current prevention efforts
- Thousands of Texans screened for breast, cervical and colorectal cancers

Committed to Funding Only the Best of the Best

CPRIT's prevention grants program does not allocate fractions of its budget for a specific award mechanism or cancer type. Rather, expert review panels have been established that are capable of reviewing a wide range of proposals and only the best, most promising prevention programs are recommended for CPRIT funding. CPRIT's selection process for prevention awards is distinctive because of the collective expertise of the superior public health professionals and cancer patient advocates who serve on the CPRIT's prevention peer review committees.

The prevention peer review committees are chaired by Dr. Lawrence Green, Professor of Epidemiology and Biostatistics in the School of Medicine and Co-Leader of the Society, Diversity and Disparities Program in the Comprehensive Cancer Center at the University of California at San Francisco, and Dr. Nancy Lee,

a private consultant with over 22 years of experience in epidemiology with the Centers for Disease Control and Prevention (CDC). Drs. Green and Lee serve as members of CPRIT's Prevention Review Council, which is led by Dr. Stephen Wyatt, Dean of the College of Public Health at the University of Kentucky, and formerly the director of the Division of Cancer Prevention and Control at the CDC. The Prevention Review Council assesses the evaluations completed by the prevention peer review committees and creates a final list of proposals recommended for CPRIT grant awards.

CPRIT is funding projects that will ensure Texans receive accurate information and referral services to reduce their risk of developing cancer, as well as education and training programs for healthcare professionals to augment their knowledge and skills, ultimately improving the health of their patients. CPRIT's projects are already having an impact — Texans are being screened for cancer (some for the first time) and making healthier lifestyle choices that will help reduce the risk of developing some cancers. Still, there is much left to accomplish — we have work to do as long as Texans are going unscreened and untreated for cancer due to economic status, lack of health insurance, or inadequate education and awareness.

CPRIT'S CANCER PREVENTION AWARDS

CPRIT's prevention awards support projects that will have a measurable impact on public health in areas of the state in greatest need. Award mechanisms cover all areas of the cancer prevention continuum and support comprehensive, cross-cutting strategies such at public education, outreach and access to care, clinical service delivery, professional training, and policy and systems change.

- Cancer Prevention Microgrant awards are designed for programs addressing tobacco prevention and control and for programs that increase the delivery of primary preventive services for all cancers and screening services for breast, cervical and colorectal cancers. Applicants may request up to a maximum of $150,000 in total funding over a maximum of 24 months.
- Evidence-Based Cancer Prevention Services awards support the delivery of evidence-based services in at least one of the following cancer prevention and control areas: 1) Primary cancer prevention (e.g. vaccine-conferred immunity, healthy diet, avoidance of alcohol misuse, physical activity, sun protection); 2) Secondary prevention (e.g., screening/early detection for breast, cervical, and/or colorectal cancer); or 3) Tertiary prevention (e.g., survivorship services such as physical rehabilitation/therapy, psychosocial interventions, navigation services, palliative care). Applicants may request up to $3 million over a maximum of three years, depending on the type of service delivered.
- Health Behavior Change Through Public and Professional Education and Training awards fund health promotion, education, and public outreach for cancer prevention, early detection, and survivorship and health care professional education and training that, if successful, would improve the practice and performance of health care practitioners and increase the number of persons who improve their health behaviors related to the prevention of cancer, obtain recommended cancer screening tests, have cancers detected at earlier stages, and improve their quality of life if they are survivors of cancer. Applicants may request up to $300,000 if addressing one audience or up to $600,000 if addressing both audiences with a coordinated message. Awards are for a maximum of two years.
- Texans Conquer Cancer Patient Support Services awards underwrite programs that provide support services for cancer patients such as transportation to and from treatment, food, and lodging. Successful applicants are eligible for a grant award of up to approximately $2,500. Grant funds for this award mechanism are made available from the sale of the Texans Conquer Cancer specialty license plate.

CPRIT PREVENTION GRANT RECIPIENT PROGRAM HIGHLIGHTS

The Rose: *Empower Her to Care,*
recipient of a $1 million Evidence-Based Prevention Program and Services prevention award announced
March 10, 2010
Program Director: Dorothy Westin Gibbons

The Rose: ***Empower Her to Care Project Overview*** — The Rose, a Houston-based organization that provides breast cancer screening, diagnostic, and access to care services, is one of CPRIT's first prevention award recipients. With its CPRIT award, the Rose is expanding its service area to reach more women in need, with particular focus on reaching women who do not have insurance, have never received a mammogram, or have not received a mammogram in over 5 years.

Program Update: Dorothy Westin Gibbons, CEO and co-founder of the Rose reports, "In our first two months we were able to connect with 200 women. We found 12 cancers. I guarantee you if it hadn't been for the CPRIT money we wouldn't have found these."

Patricia Stoll, an *Empower Her to Care* client, was uninsured when she first noticed a lump in her breast. She had not had a mammogram since 2002. With CPRIT support, the Rose was able to provide Patricia with mammography and diagnostic services that detected her cancer. The Rose then used its patient navigation program to help Patricia get into treatment.

Why CPRIT Funding Makes a Difference: Ms. Stroll explains, "When I was diagnosed, I didn't have the insurance and I didn't have the money available to get the testing done. The funding from the Rose…probably saved my life. I don't know what I would have done without it."

"When I was diagnosed, I didn't have the insurance and I didn't have the money available to get the testing done. The funding from the Rose… probably saved my life. I don't know what I would have done without it."

–Patricia Stroll, *Empower Her To Care* client

Dallas Cancer Disparities Community Coalition: Breast Cancer Prevention Education at the University of North Texas Health Science Center at Fort Worth, recipient of $300,000 Health Promotion, Public Education, and Outreach Programs grant award
Program Director: Dr. Kathryn Cardarelli

Program Overview: This CPRIT-funded education and outreach project provides 8-week education sessions promoting breast cancer screening and healthy lifestyle behaviors to women at high risk living in South Dallas. Women living in South Dallas have a high proportion of initial Stage III and IV diagnoses compared to Dallas County averages.

Reducing breast cancer disparities in South Dallas will be accomplished using a community-based participatory approach, which aims to bridge the gap between knowledge produced through research and community health practices. The University of North Texas Health Science Center and community partners are collaborating through the Dallas Cancer Disparities Community Coalition to implement a community-based breast cancer prevention education intervention program.

Through the program, 280 women living in zip codes 75210, 75215, and 75223 will participate in an intensive breast health education program intended to provide information regarding early detection and to increase the number of women receiving breast cancer screening uptake. The women in the CPRIT-funded program will receive comprehensive health education through group classes and in-home visits, and 200 women will receive a mammogram. Additionally, the Health Coordinator will act as a navigator for those who need follow-up care.

Program Update: Following completion of the project's first education series, results show that participants are taking action, adopting healthy lifestyle choices, and getting screened through a partnership initiated with a local hospital. Many of these women had never had a mammogram, and are now sharing the important message of early detection with others.

"Being a part of the program meant a lot to me because… breast cancer was a fear I had, but these breast cancer awareness classes helped me not to be fearful and to open up, listen and learn…and I learned a lot," said Estella S. "I'm excited… to share this information with other people, especially those that don't know anything about breast cancer."

"'Yes, lives will be saved,' I thought, when I heard we had been awarded this grant."

–Dr. Marjorie Jenkins, Executive Director, Texas Tech University Health Sciences Center's Laura W. Bush Institute for Women's Health

Access to Breast Care for West Texas (ABC4WT) at Texas Tech University Health Sciences Center and the Laura Bush Institute for Women's Health, recipient of a $1.7 million Community Collaborative Prevention Programs and Services for Breast, Cervical and Colorectal Cancers grant
Program Director: Dr. Marjorie Jenkins

Access to Breast Care for West Texas (ABC4WT) Program Overview — The ABC4WT project aims to increase breast cancer screening rates and preventive care in the underserved populations of West Texas. Women living in West Texas often fail to receive the necessary mammography and other screening services due to barriers such as finances, geography, lack of childcare, or means to travel to screening locations. Hispanic, rural, and other medically underserved women in West Texas experience a higher incidence of advanced breast cancers. ABC4WT will "close the gap" between screening, diagnosis and treatment by helping women navigate the healthcare system to access breast screening and diagnostic services.

Program Update: During the first three months of its CPRIT-funded grant, ABC4WT has connected with more than 350 women, providing information, screening and diagnostic work-ups. ABC4WT also educates community health workers and health professionals throughout the Panhandle regarding mammography services available through the CPRIT-funded program.

Why CPRIT Funding Makes a Difference: According to ABC4WT Program Director, Dr. Marjorie Jenkins, in the first three months of CPRIT-funding, "Twenty-one women who otherwise would not have funds nor access to mammograms have been screened, with two of these being identified as needing follow-up in six months. Without this CPRIT program, these two ladies would not have been seen.

There would be no follow-up. The consequences could be tragic, but because of these funds, quality care is being provided."

Helen M., who lives in Amarillo with her son, attended Hablando de la Salud de la Mujer, a health symposium that allowed ABC4WT to connect with community members. She speaks no English, but through her son she expressed concerns that she had never had a mammogram and fears about breast cancer. With CPRIT support, ABC4WT was able to provide a screening mammogram for her, which resulted in a follow-up diagnostic and biopsy. Thankfully the biopsy was benign. Helen was very grateful to have walked into Hablando and asked about mammograms.

Dr. Jenkins explains, "CPRIT is changing the landscape of cancer prevention and research throughout the state of Texas. Through CPRIT, the state of Texas is leading the way for a future filled with successful cancer prevention programs and research discoveries to benefit Texas and our nation."

The City of Laredo Health Department: Taking Screening to the Streets, recipient of a $2.5 million Community Collaborative Prevention Programs and Services for Breast, Cervical and Colorectal Cancers grant award
Program Director: Dr. Hector Gonzalez

Taking Screening to the Streets Program Overview: Early detection and health education for cancer diagnosis and treatment is critically important for prevention. However awareness and health care access for many is still a barrier, especially for underserved and medically indigent communities along the Texas/Mexico Border where many still lack appropriate and adequate access to care and prevention. As the population ages, chronic disease and early detection are even more important. Yet today there is already a significant disparity in breast, cervical and colorectal cancer in this primarily Mexican American/Latino population.

"These resources will have a direct impact in Laredo and will possibly save many lives in our community to promote the early detection as a preventive measure against cancer."

–State Representative Richard P. Raymond

Through education outreach by community lay health workers, the project will increase cancer early detection awareness as well as link the community to healthier lifestyles (exercise, nutrition and smoking cessation). With increased awareness to seek cancer screening services, the enhanced network of community points of entry will serve as a safety net to augment access, especially for those most at risk and who are least likely to seek or afford services. Through the CPRIT-funded program, the Health Department (Buena Vida/La Familia) and other community health centers provide the screening services for colorectal, cervical, and breast cancers as well as HPV vaccines to prevent cervical cancer, and health education regarding cancer prevention.

Program Update: In just over three months, the City of Laredo Health Department and its partners (including cancer centers, non-profit clinics, community clinics, and other providers) have enhanced their service capabilities related to cancer prevention and early detection. The project has screened over 2,000 patients for breast, cervical and/or colorectal cancer; and is offering targeted wellness

screenings for topics such as smoking prevention, nutrition, and exercise. Patients are becoming aware of wellness and prevention as a means to reduce cancer risk factors and are complying with timely early detection recommendations.

Dr. Gonzalez reports on one client, a 52-year-old woman, whose CPRIT-funded breast cancer screening mammogram detected intraductal carcinoma. She received surgery in San Antonio in January 2011 through the Texas Wings program and will receive six weeks of radiation treatment. The CPRIT-funded screening was her very first mammogram.

DEVELOPING AND IMPLEMENTING THE TEXAS CANCER PLAN

The *Texas Cancer Plan* aims to reduce the cancer burden across the state and improve the lives of Texans. By state statute, CPRIT is charged with the responsibility of facilitating the development of the *Plan* and supporting its implementation. As the statewide blueprint for cancer prevention and control, the *Plan* identifies the challenges and issues that affect our state and presents a set of goals, objectives, and strategies to help inform and guide communities in the fight against cancer.

The *Texas Cancer Plan* is developed with input provided by organizations and institutions, community leaders, planners, coalition members, cancer survivors, and family and friends affected by cancer from across the state. The overall outcome and success of the *Plan* will depend on the cooperation, collaboration and resources of the many stakeholders that cover our great state. CPRIT's strategic direction and funding opportunities will align with the *Plan* but will, by necessity, be a subset of the *Plan*.

With the next revision to the *Texas Cancer Plan* currently underway, CPRIT looks forward to active participation from work group members and statewide partners to ensure the Texas Cancer *Plan* delivers on its promise to better the lives of Texans. The next revision to the *Plan* is slated to be finalized in early 2012. The 2005 Texas Cancer *Plan* is available at www.cprit.state.tx.us.

CPRIT'S OUTREACH INITIATIVES

Although its primary purpose is to award money for cancer research and prevention, CPRIT will continue to be a magnet for attracting the best and brightest minds to the state and providing a forum to share that expertise.

CPRIT's *Innovations in Cancer Research and Prevention Conference*

CPRIT hosted the inaugural *Innovations in Cancer Research and Prevention Conference* on November 17-19, 2010. More than 850 attendees, representing the best minds in the field of cancer research and prevention, gathered in Austin in celebration of CPRIT's early achievements and as a call to action to work quickly toward research, prevention and treatment. Conference plenary sessions addressed topics such as cancer genetics, targeting "undruggable" cancers, future directions in cancer prevention and control, breakthroughs in drug development, and applying for CPRIT grants. We were honored to have the Honorable Susan Combs, Texas Comptroller of Public Accounts, and Dr. Phil Sharp, Koch Institute of Integrative Medicine at the Massachusetts Institute of Technology, as keynote speakers. Lance Armstrong, Barbara Canales, and Tom Sellers shared their stories regarding cancer survivorship as part of panel presentation moderated by Evan Smith. Nearly 400 conference abstracts were presented in poster sessions at the conference, with 24 oral abstract presentations made as part of the conference program.

The 2010 conference was the first of many opportunities for colleagues and scientists from all over the country to gather and share the latest in cancer research and prevention. CPRIT's second annual conference will be held in Austin November 15 – 17, 2011.

CPRIT's Second Annual *Breakthrough Policy Roundtable*

To kick off its Innovations in *Cancer Research and Prevention Conference,* CPRIT convened its second annual *Breakthrough Policy Roundtable* in Austin on November 16, 2010. CPRIT's Policy Roundtable is an exclusive, high level discussion among thought-leaders in the industry about a pertinent issue in the cancer field as it can be applied to CPRIT's initiatives. This year, the CPRIT Policy Roundtable panelists tackled how the newly formed Statewide Clinical Trial Network of Texas (CTNeT) can add quality, speed and value to the current cancer clinical trials system. We were honored to have 16 nationally-recognized panelists participate in the CPRIT Policy Roundtable, including three Nobel Prize winners, The University of Texas M.D. Anderson Cancer Center President Dr. John Mendelsohn, and the Director of the National Cancer Institute, as well as senior leadership from the pharmaceutical industry and a representative for community oncology groups in Texas. A press briefing prior to the CPRIT Policy Roundtable drew statewide and national media attention.

KEY CONCEPTS FROM BREAKTHROUGH POLICY ROUNDTABLE

- Texas does not need "just another" clinical trials network. The country has ten. We must have networks that cut through multi-layered bureaucracy comprised of well-intentioned people who do not themselves participate in clinical trials.
- Essential elements for CTNeT trials include prospective high-standard biobanking, coupled with advanced molecular diagnostics and DNA sequencing. We must take advantage of existing biomarkers and discover new ones to guide selection of patients for trials and therapies. The technological advances of the past decade have moved the bar substantially for the first time. We now must implement the technologies broadly to bring new information to the treatment of individual patients and to further greatly our knowledge of individual cancers and what drugs can be used or developed to control them.
- We need new trial designs (adaptive trials and sophisticated biostatistical methods for evaluation) coupled with interactions with the FDA to ensure that such trials can lead to new drug approvals. However, no matter what the design, we cannot expect or promise much if we do not start with a good drug that hits an important target in the individual patient's tumor.
- We need immediate methods for evaluation of responses to therapies. It is inadequate to look for tumor shrinkage well into a course of therapy. (This has been compared to examining the flight recorder after the plane has crashed.) We must emphasize development and testing of methods to know if a tumor "feels" a drug after the first few hours or, at most, days of treatment.
- There must be more focus on mechanisms of secondary resistance to therapy. There must be molecular characterization of biopsy material obtained from tumors that have become resistant.
- We should encourage efforts to discover genetic determinants/signatures of primary resistance to available therapeutic agents.
- All results of all trials must be accessible in an open-access form, coupled with requirements for simplified recording and reporting of all end points. This must be a requirement of all who have received state support for their work.
- Build it and they will come: the five to ten year goal is for every patient who walks through the door to be a candidate for a clinical trial based on a well-defined and valuable set of criteria and a well-defined and valuable set of measurements of responses.
- Community oncologists are ready, willing, and fully capable of participation in even the most scientifically driven trials.
- We must not lose sight of the need to engage patients in ways that offer them something tangible and immediate. Without this, there is little incentive to participate. There is inconvenience and likely pain. We cannot take patients for granted; we must pay close attention to their needs and motivation.
- Patients must be co-investigators of their own cancer. CPRIT and CTNeT can play an important role in patient education: on the nature and great variability of cancer, the need to understand each cancer, and the need for trials to find the answers. Many patients get very engaged in the scientific underpinnings of their disease and treatment. It gives them at least a sense of control that can be very important.
- There would be significant value in establishing a "safe-haven" where combinations of experimental drugs from different companies could be tested — a safe haven for pre-competitive or knowingly competitive investigation.
- We should consider combinations of biologics (especially antibodies) at the earliest phases of clinical investigation. Antibodies are often free of off-target toxicities. Rational combinations might be tested in phase 1 and then moved on quickly to phase 2. Use of such combinations can offer significant benefit in avoidance of acquired resistance.
- Cooperative groups should foster communication between basic, translational, and clinical scientists. Solutions will not come from isolated lab work or by handing a drug to a physician and saying "try this".
- There is a novel opportunity to combine adult and pediatric trials where there is a shared target — even in disparate disease. There is inadequate numbers of pediatric patients for many trials.

CPRIT'S ADVISORY COMMITTEES

In carrying out CPRIT's mission, the Oversight Committee benefits from advice and input from four standing committees that are external to the governing body. These committees meet at least semi-annually and report to the CPRIT executive director and Oversight Committee executive leadership. Committee updates and reports are presented to the Oversight Committee at its quarterly meetings.

Advisory Committee on Childhood Cancers

The Advisory Committee on Childhood Cancers (ACCC) was created by statute to provide input and advice to CPRIT regarding the prevention, control and cure of childhood cancers. ACCC membership includes childhood cancer advocates and scientists whose research focus targets issues in pediatric oncology.

Commercialization Strategy Committee

The Commercialization Strategy Committee was created by the Oversight Committee to provide tactical advice regarding CPRIT's commercialization efforts and enhancing Texas' ability to move innovative products from the laboratory bench to the patient bedside.

Scientific and Prevention Advisory Committee

The Scientific and Prevention Advisory Committee (SPAC) was created by the Oversight Committee to provide advice and support services to the Oversight Committee. The 22 SPAC members represent cancer-related fields including research, clinical trials, health care delivery, prevention programs, advocacy and cancer survivorship.

University Advisory Committee

The University Advisory Committee was created by statute to advise the Oversight Committee regarding the role of institutions of higher education in cancer research.

Membership is comprised of representation from the following university systems:

- University of Texas
- Texas A&M University
- Texas Tech University
- University of Houston
- Texas State University
- University of North Texas
- Baylor College of Medicine
- Rice University

CANCER PREVENTION AND RESEARCH INSTITUTE OF TEXAS FINANCIAL SUMMARY (UNAUDITED) For the Year Ended August 31, 2010	
REVENUES	
Legislative Appropriations	$ 225,233,094
License, fees and permits	14,239
Interest income	377
Other	74,276
Total Revenues	**$ 225,321,986**
EXPENSES	
Salaries and Wages	$ 1,809,009
Other Personnel Costs	318,925
Professional Fees and Services	4,402,949
Consumable Supplies	18,097
Utilities	23,860
Travel	79,470
Rent - Building	384,485
Rent-Machine and Other	22,328
Other Operating Expenses	140,732
Grant	217,038,477
Capital Expenditures	228,060
Total Expenses	**$ 224,466,392**
EXCESS OF REVENUES OVER EXPENSES	**$ 855,594**

Financial Position of the Cancer Prevention and Research Institute of Texas

Management of the Cancer Prevention and Research Institute of Texas (CPRIT) is responsible for establishing and maintaining adequate internal control over financial reporting and compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters.

Clifton Gunderson LLP, an independent public accounting firm, has audited CPRIT's internal control over financial reporting and compliance for the year ended August 31, 2010. As a result of the audit, Clifton Gunderson LLP has ascertained that the financial statement of CPRIT "present fairly, in all material respects, the respective financial position of the governmental activities and governmental funds of CPRIT as of August 31, 2010, and the respective changes in financial position and the discretely presented component unit for the year then ended in conformity with accounting principles generally accepted in the United States of America."

CPRIT'S PERSONNEL

Executive Leadership

Bill Gimson
Executive Director

Alfred Gilman, M.D., Ph.D.
Chief Scientific Officer

Rebecca Garcia, Ph.D.
Chief Prevention Officer

Jerry Cobbs
Chief Investment Officer

Heidi McConnell
Chief Operating Officer

Kristen Doyle
General Counsel

Sandra Balderrama
Senior Advisor to the Executive Director

Staff

Laurie Baker
Receptionist

Andy Birdwell
Reimbursement Specialist

JoAnn Eckert
Director of Scientific Review

Michelle Frerich
Prevention Program Manager

Michelle Huddleston
Accountant

Yvette Jimenez
Administrative Assistant

Ramona Magid
Prevention Program Director

Lisa Nelson
Operations Manager

Ellen Read
Information Specialist

Sandra Reyes
Executive Assistant

Alfonso Royal
Finance Manager

Therry Simien
Information Technology Officer

"Texas continues to be on the forefront of cancer research and treatment thanks to the dedicated work of our medical and research communities and the overwhelming support of voters who approved the creation and funding of CPRIT in 2007. The groundbreaking ideas created as a result of these investments will bring us one step closer to finding a cure for this indiscriminate killer."

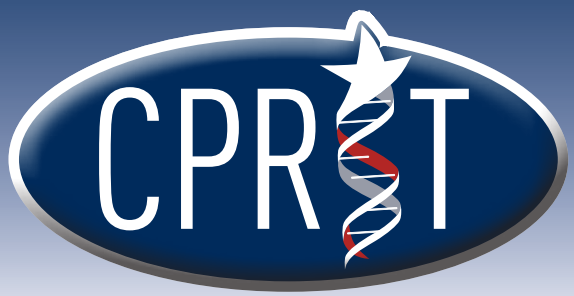
–Texas Governor Rick Perry

"Virtually every Texas family has felt the devastation cancer can cause; that's why I'm so hopeful the investment the state is making in the Cancer Prevention and Research Institute will result in life-saving preventions and cures for this horrible disease. That's also why it's vital that every taxpayer dollar spent by CPRIT is spent wisely and efficiently in this effort to beat cancer."

–Lt. Governor David Dewhurst

"Texas is now at the forefront of the fight against cancer. I support the efforts of the Cancer Prevention and Research Institute of Texas and look forward to the innovations and discoveries these funds will achieve."

–Speaker of the Texas House of Representatives Joe Straus



CANCER PREVENTION &
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