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Eliminating the Suffering and Death Due to Cancer

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NIH Conference on Tobacco Use Identifies Research Gaps

An NIH State-of-the-Science Conference on "Tobacco Use: Prevention, Cessation, and Control" issued a draft statement at the conclusion of its June 12–14 meeting that identifies the research, programs, and policies necessary to achieve further progress in reducing the individual and societal burdens of tobacco-related illnesses.

Dr. Mark Clanton, NCI deputy director and deputy director for Cancer Care Delivery Systems, stated, "We're here for this important and timely conference because tobacco prevention, treatment, and control research are so important to improving the nation's health. The purpose is to facilitate an objective review of the evidence: to clarify what is known and to identify what research gaps remain."

Panel Chairman Dr. David F. Ransohoff, of the University of North Carolina at Chapel Hill, stated that tobacco use remains the nation's leading preventable cause of premature death and that cigarette smoking alone is responsible for more than 30 percent of cancer deaths annually. Despite declines in tobacco use in recent decades, Dr. Ransohoff noted

(continued on page 2)

Director's Update

Using NCI's Expertise to Prepare for Avian Flu

Avian flu strain H5N1 represents a potentially devastating threat to public health in the United States, and preparation for its arrival on our shores is one of our nation's utmost priorities.

Responding to a potential public health threat from a virus is nothing new for NCI. Twenty-five years ago with the emergence of HIV/AIDS, the viral oncology expertise within NCI was mobilized, resulting in the successful development of therapies that have had global health impact on people living with HIV/AIDS.

As with HIV/AIDS, an avian flu pandemic could be particularly catastrophic for some of the most vulnerable populations, including cancer patients, who constitute the largest segment of immunocompromised patients in the country and would be most susceptible to this deadly strain. In addition, the impact of a pandemic would be felt for decades to come, as it could compromise many clinical trials and render useless the resources devoted to those trials.

At my urging, NCI's Center for Cancer Research (CCR) has recognized this threat and developed an excellent preparedness and response plan. The

(continued on page 2)

(Tobacco Use continued from page 1)
that "it is unlikely that the Healthy People 2010 objectives of reducing smoking prevalence to 12 percent or less in adults and 16 percent or less in youth will be reached on schedule."

About 70 percent of the nation's 44.5 million adult smokers want to quit, but fewer than 5 percent succeed in a given year. "Despite strong evidence that a variety of pharmacologic and behavioral interventions are effective for tobacco cessation, only a small proportion of tobacco users receive them," the draft report notes. "This gap represents a major national quality-of-care problem."

The conference panel addressed several key questions, including: "What are the effective strategies for increasing the implementation of proven, population-level, tobacco-use cessation strategies, particularly by health care systems and communities?" Evidence suggests that media campaigns, telephone-counseling programs (quitlines), and increases in tobacco pricing and taxation are effective.

"Although some approaches are promising, considerable heterogeneity exists within each approach type," the draft report notes. "For example, telephone counseling programs vary in intensity, referral sources, and inclusion of pharmacotherapy." The panel recommended research to examine the effectiveness of different components of telephone-based counseling, including "population quitlines vs. provider-associated programs, self-referral vs. provider referral to telephone-based counseling, and bundling of services within programs."

The panel also addressed the question, "What research is needed to make the most progress and greatest public health gains nationally and internationally?" Their recommendations include determining the effectiveness of incorporating social context in interventions and evaluating approaches to reduce tobacco use in populations that "are particularly vulnerable or where tobacco has a disproportionately adverse effect, including people who have co-occurring conditions."

Dr. Clanton commented, "While tobacco use is decreasing in developed countries like the United States, it is increasing in developing countries. A better understanding of how effective strategies for tobacco prevention and treatment can be developed and implemented across diverse populations, as well as better methods to reduce health disparities, is crucial to accelerate progress to reduce tobacco use both in the United States and worldwide." ◆

By Bill Robinson

(Director's Update continued from page 1)
plan draws on the impressive breadth of knowledge and know-how of CCR scientists, outlining the role CCR could play, in general, in responding to an avian flu pandemic, but more specifically in aiding cancer patients and oncology care professionals.

Among the vital activities CCR scientists would perform in the case of a pandemic is the development of high-throughput molecular assays for diagnosing flu strains and detecting genotypes of the flu that are resistant to antiviral agents.

Advanced testing technologies already available in CCR laboratories for use in HIV-related research can be quickly adapted to highly sensitive tests for the H5N1 strain. Accurate testing will be extremely important in the case of an avian flu pandemic. The availability of effective antiviral agents would likely be limited, thus accurate tests that can ensure that such drugs are not used in people with nonvirulent influenza strains or strains that are resistant to those agents are imperative.

In view of their expertise in conducting phase I and II trials, CCR researchers also are well positioned to rapidly perform trials of newer antiviral agents, such as oseltamivir (Tamiflu) in pediatric and adult patients.

Also, because we cannot predict the exact strain of an avian flu pandemic, vaccines that elicit broad immunity will be critical. The specialized skills of CCR researchers in developing vaccines designed to work in immunocompromised individuals will be of paramount importance in these efforts.

Beyond research, CCR would have an important role in training oncologists and oncology nurses to diagnose, prevent, and treat avian flu infections in their patients. Under this plan, the more than 125 physicians and clinical associates in CCR could be trained in activities such as vaccine administration, managing vaccine and antiviral stockpiles, and using and interpreting rapid diagnostic tests; they could then become part of rapid response teams sent around the country to combat the pandemic.

I'd like to offer my sincere congratulations to CCR Director Dr. Bob Wiltrout and all of the CCR staff who helped to develop this plan. I'm hopeful that it will be one that we'll never need to act on, but, if we do, I'm confident in NCI's ability to help soften the impact of an avian flu pandemic. ◆

Dr. John E. Niederhuber
Acting Director
National Cancer Institute

Spotlight

Of Dogs and Men: Lessons on the Fight Against Cancer

In a story featured early last year, the *NCI Cancer Bulletin* highlighted a program, then just getting underway, that helps answer human clinical research questions through studies that include pet dogs that have developed naturally occurring cancers. Now the program has convened a Comparative Oncology Trials Consortium (COTC), led by Dr. Chand Khanna of NCI's Center for Cancer Research (CCR), and several of the participating institutions are nearing the end of their first trial.

"CCR has added value to cancer research by taking on this responsibility, bringing people from the pharmaceutical industry, the federal government, and the veterinary community together," says Dr. Khanna. "I think this is quite important. It's one of the ways the intramural program at NCI is valuable. We can respond quickly and coordinate large projects successfully."

COTC includes 14 veterinary teaching hospitals across the country. All members have met strict staffing criteria and have MRI and CT imaging equipment, a dedicated clinical trial coordinator, tissue banking capability, onsite radiation therapy, and experience in electronic data reporting.

"Our clinical trials are monitored and reported on the same bioinformatics backbone that exists for human clinical trials," says Dr. Khanna. He notes that the technological platforms they use all comply with NCI technology initiatives, such as caBIG™, and that a parallel program, the Canine Comparative Oncology and Genomics Consortium, is guiding their tissue-banking efforts so that the potential of tissues collected in these trials can be maximized.

COTC's inaugural study is testing the targeted delivery of the cytokine TNF-alpha to tumor blood vessels in dogs. The TNF-alpha gene is delivered through viruses that are labeled with arginine-glycine-aspartic acid, a combination of amino acids that "sticks" to proteins found prominently in tumor vasculature. COTC investigators at the veterinary schools of the University of Tennessee, Colorado State University, the University of Missouri, and the University of Pennsylvania are participanting in this first canine clinical trial.

Dr. Steven K. Libutti, head of CCR's Tumor Angiogenesis Section in the Surgery Branch, developed the biological rationale for the study. He says that there are early indications that the targeted vector is reaching its desired destination and is not causing toxicity in the dogs. Full results will likely be published before the end of this year. "If we can confirm tumor targeting, this will make the vector extremely interesting to us for use in human clinical trials," he says.

There are distinct advantages to studies that evaluate novel human clinical agents in canines. Dogs are genetically more similar to humans than are mice, and because of their large body size, their physiology lends itself to human comparison. Also, dogs naturally develop many of the same cancers that people develop, while lab mice must be genetically engineered or triggered to develop these diseases.

Naturally occurring tumors consist of cells that are genetically diverse. The consequences of this diversity include disease recurrence and emergent resistance to therapy, problems frequently encountered in human cancer patients. Another result is metastasis, which occurs naturally in dogs with cancer, as it does in humans.

In addition to the comparable complexity of their tumor biology, an advantage of testing clinical interventions in dogs is that investigators can perform serial biopsies before and after treatment to see how a new agent is affecting the tumor over time—something that's difficult to do in human trials.

"We have some really exciting opportunities as a result of this initiative," says Dr. Khanna. He notes that the consortium is engaged in conversations with the Food and Drug Administration (FDA) about how data from the COTC trials could be included in the drug development pathway for new human drugs.

"One aspect of this discussion is when it's appropriate for canine trials to be conducted, and when it is not," says Dr. Khanna. "Our goal is to determine how these complex, relatively expensive, large-animal studies can complement mouse and other

(continued on page 5)

Cancer Research Highlights

GM Conference Highlights Advances in Cancer Genomics

In his keynote speech last week at "Genomics and Cancer," the 2006 General Motors Cancer Research Foundation's Annual Scientific Conference on the NIH campus, Dr. Eric Lander, director of the Broad Institute, noted some of the significant advances that have resulted from the mapping of the human genome, referring to it as "biology's first great community-building infrastructure."

The conference featured some of the world's leading scientists in the field of genomics and cancer research, including Dr. Napoleone Ferrara of Genentech, Inc., who was the Research Award winner for his discovery and cloning of *VEGF* and his role in developing bevacizumab, and Dr. Victor Velculescu of Johns Hopkins University, who described the genetic alterations in *PIK3CA*, one of the most highly mutated oncogenes in human cancer.

The completed genome sequence, Dr. Lander stressed, has "lit the fires of imagination" among many researchers, resulting in tools that have fundamentally altered the way in which they work.

He outlined six major goals that must be reached to fulfill the promise of genomics. Among these, he argued, is the need to fully describe, at the molecular and cellular level, all functional elements encoded in the genome and all human genetic variation. By mapping the cancer genome, through projects such as The Cancer Genome Atlas, he added, researchers will continue to break cancer down into distinct diseases and subtypes, and map out that part of the human genome relevant to each.

He also highlighted the need to develop genetic signatures of cellular response, singling out the "connectivity map" being proposed and developed by Dr. Todd Golub and colleagues that "allows researchers to essentially 'Google'" a cell signature they are working on, and get possible matches for drugs and pathway mechanisms they might never have considered. Video of the conference is available at http://videocast.nih.gov/PastEvents.asp?c=1.

New Drugs Benefit Patients with Chronic Myeloid Leukemia

Two experimental drugs are expanding treatment options for patients with chronic myeloid leukemia (CML) who cannot tolerate imatinib (Gleevec), the primary treatment. The drugs, dasatinib (Sprycel) and nilotinib, were designed to overcome imatinib resistance, and results from clinical trials suggest that the medicines can be used to treat cases of CML when imatinib fails or is not tolerated.

Dasatinib is expected to be approved in the coming weeks by the FDA based on the recent recommendation of an advisory panel, which reviewed results from early-stage clinical trials. The complete results from a phase I dasatinib trial, led by Dr. Charles Sawyers of UCLA's Jonsson Comprehensive Cancer Center, appear in the June 15 *New England Journal of Medicine* along with results from a phase I trial involving nilotinib.

The two trials provide "immediate hope for patients" whose CML cells no longer respond to imatinib, says Dr. Brian Druker of Oregon Health & Science University Cancer Institute, who led the development of imatinib, in an accompanying editorial. The results, he says, demonstrate the clinical value of understanding the molecular changes that result in imatinib resistance because this knowledge led to the development of the new drugs at an "impressively rapid" pace.

Dasatinib, manufactured by Bristol-Meyers Squibb, targets nearly all the genetic mutations that cause resistance to imatinib. To create nilotinib, chemists at Novartis modified imatinib so that the drug binds more tightly to its target, the ABL protein. Both drugs, which are pills, are more potent inhibitors of the ABL protein than is imatinib; the drugs inhibited all tested imatinib-resistant mutations except one, called T315I.

Dr. Hagop Kantarjian of the University of Texas M. D. Anderson Cancer Center, who led the nilotinib trial, says that imatinib should remain the standard of care for now because most CML patients respond to imatinib and 93 percent of them are doing well after 5 years of treatment. Phase II studies of the drug are ongoing. Like dasatinib, nilotinib has side effects, and patients should have their heart function monitored, the researchers said.

The editorial suggests that the drugs might be useful at earlier stages of CML, and clinical trials are being planned. "The good news for patients

(continued on page 5)

(Highlights continued from page 4)

with CML is that the long-term prospects for control of the disease are excellent," writes Dr. Druker.

Melanosomes Contribute to Multidrug Resistance in Melanoma

Melanoma, the most deadly of skin cancers, is resistant to radiation therapy and to many chemotherapeutic drugs, making adjuvant treatment difficult. Currently, the cellular mechanisms behind the multidrug resistance of melanoma are not well understood. A new study from researchers in NCI's CCR, published online June 15 in the *Proceedings of the National Academy of Sciences,* has identified an important role in resistance to chemotherapy for melanosomes—the organelles within pigment-producing skin cells that protect them from the toxic byproducts of pigment synthesis.

The investigators, led by Dr. Michael Gottesman, administered fluorescently labeled cisplatin to both melanoma cells and control cells from a non-melanoma skin cancer line. The labeled drug was found in the cytoplasm of melanoma cells but not in the nuclei, where it would exert its cytotoxic effect. In contrast, the drug was found in both the cytoplasm and nuclei of control cells. In melanoma cells, cisplatin found near the plasma membrane colocalized with a melanosome marker, suggesting that it was trapped inside the organelles.

Further *in vitro* experiments indicated that treating melanoma cells with cisplatin caused an increased production of the pigment melanin and a corresponding increase in the number of melanosomes. The melanoma cells then exported the melanosomes containing the cytotoxic drug out of the nucleus through a mechanism called melanosome transfer.

"The components that regulate the dynamics of melanosomes (i.e., melanosome numbers, melanosomal trapping, and export) are likely involved in drug resistance," wrote the authors. "In principle, the components of the entire melanogenic pathway could be molecular targets for the therapy of melanomas."

AHRQ Study Details Effectiveness of Anemia Drugs

A study released in May by the Agency for Healthcare Research and Quality (AHRQ) finds there is no clinically significant difference in the medical effectiveness of epoetin and darbepoetin, the two drugs commonly used for managing anemia in cancer patients who are undergoing chemotherapy or radiation treatment. The drugs showed no clinically significant difference in improving hemoglobin concentration and reducing the need for transfusion, according to AHRQ's latest comparative effectiveness review.

The review found that both drugs reduce the need for transfusion. But, it did not find evidence that they improved survival when added to cancer treatment. The report also found that many other significant questions remain unanswered about the safety and best use of both drugs.

The report, *Comparative Effectiveness of Epoetin and Darbepoetin for Managing Anemia in Patients Undergoing Cancer Treatment*, was produced by AHRQ's Effective Health Care Program, the first federal program designed to compare alternative treatments for significant health conditions and make the findings public.

Anemia occurs in 13 to 78 percent of patients with solid tumors and 30 to 40 percent of lymphoma patients. Blood transfusion can restore a low hemoglobin concentration, and adverse transfusion-related events are uncommon.

Drugs that mimic the actions of erythropoietin can be used to correct anemia and reduce the need for transfusions. Two drugs are commercially available in the United States—epoetin alfa (Epogen and Procrit) and darbepoetin alfa (Aranesp), a newer, longer acting drug that requires fewer injections.

The review compared the drugs' effectiveness and safety. In particular, it sought to determine whether darbepoetin differed from epoetin in its ability to achieve key treatment goals. The evidence showed that the drugs did not differ significantly in reducing transfusion need; it was uncertain whether either drug had a meaningful effect in improving quality of life. ◆

(Spotlight continued from page 3)

preclinical models and optimize the drug development process."

In the current trial, Dr. Libutti notes that if it demonstrates targeting of spontaneous tumors in dogs, "we can potentially study the activity of a wide variety of agents that have the potential to be active in the local tumor microenvironment. Such therapies may be beneficial both to the pet animals with tumors, as well as to our patients.

"It's an excellent example of how dogs can truly be man's best friend," he says. "In this case, both man and dog have the potential to benefit." ◆

By Brittany Moya del Pino

Funding Opportunities

Development of Advanced Genomic Characterization Technologies

Announcement Number: RFA-CA-07-021
Letter of Intent Receipt Date: July 24, 2006
Application Receipt Date: Aug. 24, 2006

This funding opportunity will use the R21 award mechanism. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3491. Inquiries: Dr. Daniela S. Gerhard—gerhardd@mail.nih.gov

Development of Advanced Genomic Characterization Technologies

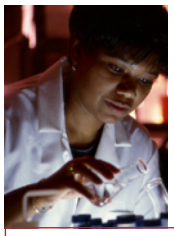
Announcement Number: RFA-CA-07-029
Letter of Intent Receipt Date: July 24, 2006
Application Receipt Date: Aug. 24, 2006

This funding opportunity will use the R43 and R44 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3492. Inquiries: Dr. Daniela S. Gerhard—gerhardd@mail.nih.gov

Development of Advanced Genomic Characterization Technologies

Announcement Number: RFA-CA-07-030
Letter of Intent Receipt Date: July 24, 2006
Application Receipt Date: Aug. 24, 2006

This funding opportunity will use the R41 and R42 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3493. Inquiries: Dr. Daniela S. Gerhard—gerhardd@mail.nih.gov ◆



Featured Clinical Trial

Targeted Therapy for Metastatic Prostate Cancer

Name of the Trial
Phase II Study of Docetaxel, Bevacizumab, Thalidomide, and Prednisone in Patients with Metastatic Androgen-Independent Adenocarcinoma of the Prostate (NCI-04-C-0257). See the protocol summary at http://cancer.gov/clinicaltrials/NCI-04-C-0257.

Principal Investigator
Dr. William Dahut, NCI CCR

Why This Trial Is Important
Hormonal therapy for prostate cancer removes or blocks the action of hormones (androgens) that trigger prostate cancer cell growth. In most patients, prostate cancer that has spread (metastasized) to other parts of the body responds dramatically to hormonal therapy. However, over time, prostate tumors acquire the ability to grow without the help of hormones. This is called androgen-independent prostate cancer.

Clinical trials have shown that chemotherapy with the drug docetaxel improves the survival of men with metastatic, androgen-independent prostate cancer. Currently, the combination of docetaxel and prednisone, a steroid drug, is approved by the FDA for treatment of androgen-independent prostate cancer.

This trial is evaluating the addition of two targeted therapies, bevacizumab and thalidomide, to chemotherapy with docetaxel and prednisone. Bevacizumab and thalidomide both interfere with the formation of new blood vessels in tumors, which is required for tumor growth and survival. These targeted therapies inhibit different cell-signaling pathways used by tumors to make new blood vessels and should, therefore, be more effective when given together than when either is given alone.

Dr. William Dahut

The preliminary results of this trial have been promising. "Of the 26 patients we've enrolled so far, only one patient has come off the trial for progression of disease," said Dr. Dahut. "The trial has been open for about a year, and the median survival of these patients with androgen-independent prostate cancer is about 15 months. That patients are still responding after a year is encouraging."

Who Can Join This Trial
Researchers seek to enroll 33 to 60 patients aged 18 or over who have metastatic prostate cancer that has progressed despite hormone-suppressing therapy. See the list of eligibility criteria at http://cancer.gov/clinicaltrials/NCI-04-C-0257.

Study Site and Contact Information
The study is taking place at the NIH Clinical Center in Bethesda, Md. For more information, call the NCI Clinical Studies Support Center at 1-888-NCI-1937. The toll-free call is completely confidential. ◆

An archive of "Featured Clinical Trial" columns is available at http://cancer.gov/clinicaltrials/ft-all-featured-trials.

Notes

A Lion in the House to Air on PBS

On June 21 and 22, *A Lion in the House*, a two-part documentary about childhood cancer, will air on the "Independent Lens" series on most public television stations across the country. The 4-hour documentary details 6 years in the lives of five young people aged 6 to 19—and their families—as they undergo cancer treatment at Cincinnati Children's Hospital. In a review of the film, *The Lancet* called it a "fascinating tale of bravery and hope."

At the Children's Inn at NIH last week, representatives from the national media heard the inside story of the making of *A Lion in the House.* The discussion touched on many psychosocial issues that emerge in families of children with cancer and was moderated by Susan Dentzler, a medical reporter from the Public Broadcasting Service (PBS). NCI participants included Drs. Crystal Mackall, acting chief of the Pediatric Oncology Branch; Lori Weiner, coordinator of the Pediatric Psychosocial Support and Research Program; and Steve Channock, head of the Genomic Variation Section in NCI's CCR. They emphasized the crucial role of the health care team in supporting the family. "You're simply not a good doctor if you can't communicate with that family, which starts with hearing their story as they see it, so that you can meet them where they are," said Dr. Mackall.

For more information about the film and air times on local PBS stations, go to http://www.pbs.org/previews/itvs_lioninthehouse.

New Monograph Available

A new NCI monograph, *Cancer Epidemiology in Older Adolescents and Young Adults 15 to 29 Years of Age, Including SEER Incidence and Survival: 1975-2000*, is the first to provide detailed information about cancer incidence and outcomes in adolescents and young adults, a group in which there are unique patterns of cancer incidence.

A collaborative effort between NCI's Surveillance, Epidemiology, and End Results (SEER) program and the NCI-funded Children's Oncology Group, the monograph gathered population-based incidence, mortality, and survival data specific to cancers in the older adolescent and young adult population, along with epidemiological data and risk factors for the development of age-specific cancers.

The monograph is intended to educate medical providers and the public about cancer incidence and survival among those aged 15 to 29, and provide the impetus for further research to improve the survival and the quality of life in this population. The monograph can be viewed and downloaded at http://seer.cancer.gov/publications/aya.

caBIG™ Wins Computerworld Award

On June 5, NCI's Cancer Biomedical Informatics Grid (caBIG™) received the 21st Century Achievement Award, the top honor in the Science category, from the Computerworld Honors Program. The program "commemorates the contributions people and organizations have made to the betterment of society through the exceptional—if not heroic—use of information technology." For more information about the award, go to http://www.cwhonors.org. For more information on caBIG™, go to https://cabig.nci.nih.gov/.

NCAB Meeting Held

The National Cancer Advisory Board (NCAB) held its most recent meeting on June 14. A copy of the agenda can be found at http://deainfo.nci.nih.gov/advisory/ncab/138_0606/agenda.pdf. A videocast of the meeting can be found at http://videocast.nih.gov/PastEvents.asp?c=998.

NCI-Frederick Redesigns Web Site

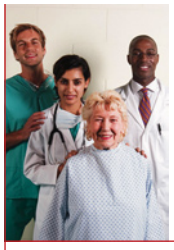
In response to a range of suggestions, NCI-Frederick has redesigned its Web site: http://web.ncifcrf.gov. The new site includes enhanced navigation and search capacity, a news center, a listing of the most used links, and a daily events calendar. ◆

CCR Grand Rounds

June 27
Dan Ihde Memorial Lecture
Dr. Paul A. Bunn, Jr., Professor and Director, University of Colorado Cancer Center, Grohne/Stapp Chair in Cancer Research, University of Colorado. "EGFR Tyrosine Kinase Inhibitor for Lung Cancer: Patient Selection and Methods to Overcome Primary Resistance."

July 4
No lecture; Federal holiday

CCR Grand Rounds are held 8:30 to 9:30 a.m. at the NIH campus in Bethesda, Md., in the Clinical Center's Lipsett Amphitheater. ◆



Cancer Center Profile

University of North Carolina (UNC) Lineberger Comprehensive Cancer Center

Director: Dr. H. Shelton Earp • CB# 7295 Chapel Hill, NC 27599-7295
Phone: 919-966-3036 • Web site: http://unclineberger.org

Background

UNC Lineberger Comprehensive Cancer Center is a cancer center at one of the nation's premier public universities. The center, led by founding director Dr. Joseph S. Pagano, achieved NCI designation in 1975 and was awarded comprehensive status in 1990. Now under the direction Dr. Shelton Earp, the center is the organizing structure for cancer care and research conducted by faculty in the College of Arts and Sciences and 12 professional schools, including Schools of Public Health and Medicine. Consequently, the 260 members come from and interact with diverse disciplines including psychology, physics, computer science, fundamental biology, genetics, and chemistry, as well as population, behavioral, statistical, and the clinical sciences. In this multifaceted environment, members hold over $170 million in annual research and training grants, including $48 million in NCI funding.

Patient Care

UNC Lineberger offers treatment for a wide range of cancers using a multidisciplinary team approach to patient care. The 13 multidisciplinary programs include all major adult and pediatric solid and hematologic malignancies. About 2,500 new cancer patients are diagnosed each year. Patients from all 100 North Carolina counties make 95,000 outpatient visits annually. Patients have access to a wide range of support services including a resource center, patient counselors, and support groups. Construction is underway on the NC Cancer Hospital, funded by a $180 million bond issue provided by the North Carolina Legislature. With an estimated completion date of 2009, the new facility will greatly enhance all facets of patient care and clinical research, including prevention activities for patients' family members.

Research Activities

UNC Lineberger's mission is to reduce cancer incidence, morbidity, and mortality in North Carolina and the nation through research, treatment, training, and outreach. The Center emphasizes interdisciplinary basic, clinical, and translational cancer research and a population sciences program spanning epidemiology, early detection, prevention, and behavioral science. An emphasis on clinical research faculty recruitment across multiple departments has led to a wide range of investigator-initiated clinical trials.

Other Notable Programs

UNC Lineberger holds Specialized Programs of Research Excellence in breast and gastrointestinal cancers, is a Department of Defense Prostate Cancer Center of Excellence, and was recently awarded a Center for Cancer Nanotechnology Excellence grant. Cancer Center faculty also direct the CDC coordinating center for the Cancer Prevention and Control Research Network, large population-based case-control studies, and 14 P01 grants.

UNC Lineberger outreach activities extend across North Carolina to increase cancer prevention and screening activities through partnerships with community leaders, businesses, and government agencies. The Center has special research expertise in medically underserved populations and health disparities, as well as an emerging strength in molecular studies of racial differences in breast, colon, and prostate cancers. ◆

The *NCI Cancer Bulletin* is produced by the National Cancer Institute (NCI). NCI, which was established in 1937, leads the national effort to eliminate the suffering and death due to cancer. Through basic, clinical, and population-based biomedical research and training, NCI conducts and supports research that will lead to a future in which we can identify the environmental and genetic causes of cancer, prevent cancer before it starts, identify cancers that do develop at the earliest stage, eliminate cancers through innovative treatment interventions, and biologically control those cancers that we cannot eliminate so they become manageable, chronic diseases.

For more information on cancer, call 1-800-4-CANCER or visit http://www.cancer.gov. Contact the *NCI Cancer Bulletin* staff at ncicancerbulletin@mail.nih.gov.