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Genome Survey Links Many Genes to Breast, Colon Cancers

Last week, researchers reported the results of the first attempt to identify the genetic alterations involved in two common cancers using the tools developed to sequence the human genome.

They identified 189 mutated genes in tumors from patients with breast or colon cancers. The vast majority of genes had not been linked to cancer previously.

The team, led by researchers at the Johns Hopkins Kimmel Cancer Center, analyzed 13,000 genes in 11 colon tumors and 11 breast tumors. Each tumor had 90 genetic mutations on average, of which 11 to 17 mutations may have been critical in causing cancer.

Different sets of genes were mutated in colon tumors and breast tumors; the types of mutations were also different. Patients with the same cancer also tended to have different types of mutations, the researchers reported online September 7 in *Science*.

"These results may explain the clinical diversity that physicians have been talking about for a long time," says co-leader Dr. Victor Velculescu of Johns Hopkins. "The genetic diversity of cancer may underlie the clinical diversity." *(continued on page 2)*

Director's Update

Unique Program Fosters Technology Development

Last week, more than 100 NCI-sponsored investigators met in Bethesda, Md., to discuss their projects and share ideas about the best ways to develop the technologies of the future. With just a glance at the agenda, you can see that this 2-day session echoed many of the exciting themes of today's cancer research: biomarkers, proteomics, signal transduction pathways, cellular imaging, and identification of cancer stem cells.

It is becoming clearer every day that technology development will both integrate and drive the chemical, physical, and biological sciences.

NCI's Innovative Molecular Analysis Technologies (IMAT) program, which hosted last week's event, is aimed squarely at devising and developing novel and emerging technologies in the support of cancer research, treatment, diagnosis, and prevention. In other words, technology is fueling the engines of discovery and translation.

Launched in 1998 under the NCI leadership of Dr. Richard Klausner, the IMAT program was, in many ways, a response to what NCI leaders correctly saw as the forthcoming genomics revolution. But Dr. Klausner and his *(continued on page 2)*

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But the genetic diversity may not be as great as it now appears, he adds, because some of the mutated genes may participate in the same cellular processes, or pathways.

If this can be confirmed in follow-up studies, the hope is that drugs could be designed to intervene at a point in the pathway that may benefit patients with various related mutations.

Drs. Bert Vogelstein and Kenneth Kinzler of Johns Hopkins co-led the study, which cost about $5 million and was funded in part by NCI. In recent years, their laboratories have screened families of genes linked to cancer, and the new study expands the scope.

"We realized from our earlier work that to find cancer genes you really have to look for them in an unbiased way," says Dr. Velculescu. A genome-wide screen makes no assumptions about which genes are important and often yields surprises.

Mutations that were identified in the initial set of 22 tumors were subsequently assessed in 48 additional tumors. Mutations that occurred frequently were scrutinized for possible roles in cancer.

The 13,000 genes are the best-studied of the roughly 20,000 genes in the human genome. As with all genome projects, the results represent a beginning rather than an end.

"To make the findings most useful, we need to integrate them with other types of data, such as epigenetic changes and chromosomal anomalies," says co-author Dr. Will Parsons of Johns Hopkins.

The results, he adds, "show how much remains to be learned about cancer and also the importance of doing these types of studies for different cancers."

The sequences of cancer genomes are ultimately obtainable, the researchers conclude. The methods, they note, will improve as more sequencing data are accumulated through The Cancer Genome Atlas (TCGA) Pilot Project and other efforts now under way.

Leaders of TCGA said last week in a statement that the *Science* paper was "proof of principle" of the potential benefits of large-scale mutational screens for cancer.

"The strategy works," says Dr. Sanford Markowitz of Case Western Reserve University, a leader of the *Science* study and longtime collaborator with the Hopkins group. "But I wouldn't want anyone to think we have finished with breast cancer and colon cancer.

"There is still very important work to been done on these diseases and on the cancer genome," he says. ◆

By Edward R. Winstead

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staff also realized that, because of their high-risk nature, technology-related grant applications traditionally did not fare well in the R01 grant review process, the principal means of funding for individual investigators. Thus, a successful program was born.

Today, IMAT cuts across nearly all of NCI's extramural divisions, working to develop technologies that will, for example, detect alterations and instabilities in DNA, accurately measure gene expression, detect and analyze proteins and their functions, and generate novel systems of drug delivery through nanobiology. IMAT funds high-risk, high-reward projects, which are often at a conceptual stage, with little available experimental data. Grant applications are typically in proof-of-concept form.

Among the technology tools developed through the program are gene expression arrays, ultra-high-throughput molecular detection platforms, photo-stable molecular labels, and specific methods and technologies for clinical specimen preservation.

The success of the IMAT program stems, in part, from its structure. The program utilizes a staged approach, in which an exploratory or pilot project precedes a more advanced developmental or implementation phase. The exploratory/pilot requires the creation and use of quantitative milestones that address specificity, sensitivity, speed, and other performance parameters. The technology developed from the program is disseminated via collaboration, publication, licensing, and commercialization.

NCI has committed approximately $10.5 million each year in the 2005 and 2006 fiscal years to the IMAT program. These dollars go toward soliciting and funding highly innovative, high-risk, cancer-relevant technology development projects ($3 million); developing emerging technologies within an appropriate biological or clinical cancer-relevant context or setting ($3 million); and developing sample preparation techniques and methodologies that are essential for effective research, technology development, and validation toward clinical application ($1 million). In addition, approximately $3 million in SBIR funds are used to support highly innovative technologies in private-sector company projects.

The IMAT program has made more than 300 awards since its inception, and both the number and quality of applications have steadily risen. Currently, the program is funding approximately 50 awards per year. About a third of the program's awards are made to small business concerns. Another attribute

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Cancer Research Highlights

Paclitaxel Fails as Ongoing Treatment for Metastatic Breast Cancer

Taxane drugs, such as paclitaxel, have shown effectiveness in helping to stabilize metastatic breast cancer and prolong the time to disease progression. However, whether chemotherapy should be continued once disease stabilization has been achieved is controversial. A new study from Italy, the Maintenance Paclitaxel 1 (MANTA1) study, has now shown that continuing paclitaxel treatment as maintenance therapy in patients whose cancer has been stabilized does not improve progression-free survival.

In the study, 238 patients with metastatic breast cancer and no evidence of disease progression after chemotherapy with paclitaxel and doxorubicin or epirubicin were randomly assigned to receive eight additional doses of paclitaxel, given once every 3 weeks, or no additional treatment. The study was stopped in 2002 when it became clear that there was no difference in progression-free survival or overall survival between the two patient groups. Some patients treated with paclitaxel experienced severe side effects from the drug, including a loss of white blood cells and nerve damage.

Lead author Dr. Alessandra Gennari of the National Cancer Research Institute in Genoa, Italy, and colleagues concluded in the August 20 *Journal of Clinical Oncology* that the policy of prolonging treatment after aggressive modern combination chemotherapy cannot be recommended for women with metastatic breast cancer.

Since the beginning of this study in 1998, administration of paclitaxel maintenance therapy has increased to once a week. Therefore, a possible benefit from more aggressive maintenance therapy cannot be ruled out.

New Treatment Pays Dividends in Pediatric Medulloblastoma

Significantly altering how both radiation and chemotherapy are used to treat children with medulloblastoma can significantly improve survival for patients with high-risk disease, according to clinical trial results released early online September 7 in *Lancet Oncology*.

Led by researchers from St. Jude Children's Research Hospital, the 134-patient study entailed giving patients with high-risk disease higher doses of radiation therapy and all patients a more "dose-intensive" chemotherapy regimen—that is, higher than usual doses for 4 months, instead of lower doses over 12 months, which is the current standard of care.

The 5-year event-free and overall survival rate for high-risk patients (metastatic disease or a tumor larger than 1.5 cm^2 after surgery) was 70 percent compared with historical rates of 30 to 40 percent. High-risk patients with metastatic disease (who made up 85 percent of that group) had an overall survival rate of 66 percent.

"Meticulous staging and careful attention to detail during radiotherapy planning and treatment are essential to obtaining similar outcomes," said the study's lead author, Dr. Amar Gajjar, who directs the Division of Neuro-Oncology at St. Jude.

Among average-risk patients, 5-year event-free survival was 83 percent, on par with outcomes following standard chemotherapy regimens. The use of dose-intensive chemotherapy in average-risk patients, cautioned Dr. Howard Fine, chief of the NCI Neuro-Oncology Branch, may increase their chances of greater short-term and/or long-term toxicity "with no apparent benefit compared to historical controls." But a shorter overall length of treatment in the new dose-intense regimen also could reduce long-term morbidity, he continued, noting that future comparative trials will have to study these issues closely.

Finally, the results of a regimen tested in only a few select pediatric brain tumor centers of excellence may not be comparable to the historical data obtained from the often poorer outcomes seen when such treatment regimens are expanded to larger multi-institutional trials, Dr. Fine added.

Analyses of tumor samples, the study authors reported, confirmed earlier suggestions that patients whose tumor samples had activating mutations in the CTNNB1 gene are more likely to have superior outcomes.

70-Gene Signature for Breast Cancer Risk Validated

Researchers have independently validated a 70-gene signature created in 2002 to assess the risk of recurrence of breast cancer among certain women with node-negative disease. The signature, developed at the Netherlands Cancer Institute, has been used experimentally to identify patients who do not need adjuvant chemotherapy because the risk of recurrence is so low that withholding chemotherapy would not compro-

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mise long-term health.

The study to validate the 70-gene signature, or classifier, included 307 women with node-negative cancers and certain types of tumors. The classifier was more predictive of the risk of recurrence, the risk of distant metastatic recurrence, and death from any cause than were several standard clinical prognostic methods, the researchers reported in the September 6 *Journal of the National Cancer Institute* (*JNCI*).

"We believe the results justify proceeding to a prospective study," wrote Dr. Marc Buyse of the International Drug Development Institute in Brussels, and his colleagues in the TRANSBIG Consortium.

The validation study in *JNCI*, noted Dr. Richard Simon of NCI's Division of Cancer Treatment and Diagnosis in an accompanying editorial, did not evaluate the clinical utility of the classifier. According to Dr. Simon, this can only be accomplished by randomly assigning a defined group of patients to have their treatment determined on the basis of either 1) the gene classifier or 2) standard practice guidelines. If the patients in the first group have better outcomes than those in the second, then clinical utility is established.

ERCC1 Expression in Lung Cancer May Predict Survival Benefit from Cisplatin

A new substudy from the International Adjuvant Lung Cancer Trial (IALT)—the IALT Bio study—has identified lack of expression of the DNA-repair protein ERCC1 as a possible predictor of increased survival after cisplatin-based chemotherapy. The results, published in the September 7 *New England Journal of Medicine*, showed that patients whose tumors lacked ERCC1 expression derived a significant survival benefit from adjuvant cisplatin-based chemotherapy, but patients with ERCC1-positive tumors did not.

The IALT Bio investigators used immunostaining to evaluate ERCC1 expression in tumor and control tissue taken from 761 patients who participated in the IALT trial; 389 had received adjuvant cisplatin-based chemotherapy, and 372 were followed without further treatment after surgery. The investigators then compared overall survival within the chemotherapy and control groups based on ERCC1 status.

Expression of ERCC1 correlated with age, tumor histology, and whether the tumor had spread into the pleura. For patients with ERCC1-negative tumors, the addition of chemotherapy significantly improved 5-year overall survival, which was 47 percent in the chemotherapy group and 39 percent in the control group. The addition of chemotherapy did not significantly improve survival for patients with ERCC1-positive tumors.

"Our results suggest that determination of ERCC1 expression in non-small-cell lung cancer cells before chemotherapy can make a contribution as an independent predictor of the effect of adjuvant chemotherapy," stated the authors. The next question for researchers, explained Dr. Eddie Reed of the Centers for Disease Control and Prevention in an accompanying editorial, "is whether this information can be used prospectively."

Intervention Increases Mammography Rates Among Triracial Women

Lay health advisor (LHA) intervention improved mammography utilization and knowledge among rural, low-income white, African American, and Native American women in Robeson County, N.C., according to study results in the September 6 *JNCI*. Minority women and women of low socioeconomic status have lower rates of breast cancer screening and higher rates of breast cancer mortality.

The study, conducted from February 1998 through January 2002, included 851 women who were randomly assigned to the LHA intervention group or comparison group. Prior to group assignment, researchers conducted baseline interviews to gather information on breast cancer screening, cancer history, and social support, as well as knowledge of, beliefs on, and barriers to mammograms. The 9- to 12-month LHA intervention consisted of three in-person visits with a trained LHA who provided information about cancer risk and overcoming barriers to mammograms, and follow-up phone calls and mailings to encourage women to get a mammogram. The comparison group received a letter on getting a mammogram and an NCI brochure on cancer and mammography 3 and 6 months after random assignment. Both groups completed a follow-up survey at the study's culmination.

Researchers found that 42.5 percent of the women in the LHA intervention group and 27.3 percent in the comparison group received a mammogram in the 12 months before the follow-up assessment. In addition, women in the LHA intervention group showed an increase in knowledge about breast cancer screening and a reduced risk of reporting barriers to getting a mammogram, such as lack of encouragement, time, and cost of a mammogram.

The study's authors concluded that "Future research should examine cost-effective ways to disseminate such interventions. These strategies are needed to reduce the disparate burden of disease among underserved populations." ◆

Spotlight

Report to the Nation: U.S. Latinos and Cancer

The overall decline in cancer death rates in the United States, a trend first reported in the early 1990s, continued through 2003, according to the *Annual Report to the Nation on the Status of Cancer*, published online September 6 in *Cancer*.

The report provides updated statistics on cancer rates and trends from 1975 through 2003. It features a special section on cancer among Hispanic/Latino populations living in the United States.

Overall cancer incidence rates (the rates at which new cancers are diagnosed) have been stable for both sexes and all races combined from 1992 through 2003.

For men, the overall incidence rates were stable from 1992 through 2003, but the same rates for women increased from 1979 through 2003, due in part to small but persistent increases in lung cancer. This year, however, there was some apparent good news.

"The rate of new cases of female lung cancer is still increasing, but the rates of increase are slowing down," says lead researcher Dr. Holly L. Howe of the North American Association of Central Cancer Registries, Inc. (NAACCR).

Another change is that incidence rates for breast cancer have stabilized, ending a rise that began in the 1980s. The researchers will not know for several years whether this indication of a changing trend is a true reversal or a random fluctuation.

The incidence rate of thyroid cancer among women has doubled several times since 1981. The increases may reflect improvements in the detection of the disease, but changes in risk factors may also play a role, the researchers say.

In contrast, many cancer types have declining death and incidence rates, which the researchers attribute in part to successful cancer prevention efforts to reduce exposure to tobacco and other cancer risk factors.

"The statistics for cervical cancer are remarkable, in that both incidence and death rates have been decreasing for all racial and ethnic groups since 1975," the researchers write.

Improvements in screening have "had a measurable impact on this disease," but not all women have benefited equally, the report notes. In fact, disparities prevail among women of different socioeconomic backgrounds.

Disparities are a focus of the report's special section, which is the most comprehensive collection of cancer information about the nation's rapidly growing Hispanic/Latino populations.

"The report covers almost all of the Latino population in the U.S. and is really the first of its kind," says Dr. Howe.

Latinos had lower incidence rates for most cancers from 1999 to 2003 compared with non-Latino white populations, but had higher rates for myeloma (in females) and cancers of the stomach, liver, kidney, and cervix.

The report, which will appear in print in the October 15 *Cancer*, confirms previous findings that cancer is frequently discovered late in Latinos.

"Latino patients are often diagnosed in the later stages of disease, when there are fewer treatment options," says co-author Dr. Amelie Ramirez of Baylor College of Medicine.

Many of the cancers with higher incidence rates in Latinos have infectious origins, including cervical cancer (human papillomavirus virus, or HPV) and stomach cancer (*Helicobacter pylori*).

On the other hand, U.S. Latinos have low rates of several cancers that are common in affluent, industrialized countries where smoking, obesity, and physical inactivity are prevalent.

The report emphasizes that not all Latino populations are alike. The findings suggest that it may not be possible to compare studies on Latino populations if the populations do not share the same origins, cultural traditions, and immigration status.

By 2050, Latino populations will have contributed significantly to the growth of the U.S. population. In order to develop national strategies for controlling cancer, accurate information about the disease in these groups is needed, the researchers conclude.

The report covers 100 percent of the U.S. population for mortality, 10 percent for long-incidence trends, 73 percent for the most recent 8-year incidence trends, and 82 percent for current-

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Funding Opportunities

Following are newly released NCI research funding opportunities:

Membrane Protein Production and Structure Determination

Announcement Number: RFA-RM-07-003
Letter of Intent Receipt Date: Sep. 27, 2006
Application Receipt Date: Oct. 27, 2006

This funding opportunity will use the R01 award mechanism. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3534. Inquiries: Dr. John C. Norvell—norvellj@nigms.nih.gov

Networks and Pathways Collaborative Research Projects

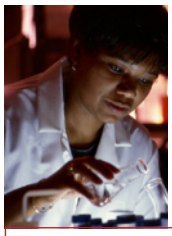
Announcement Number: PA-06-522
New Application Receipt Dates: Oct. 1, 2006; Feb. 1, June 1, and Oct. 1, 2007; Feb. 1, June 1, and Oct. 1, 2008; Feb. 1 and June 1, 2009

This funding opportunity will use the R01 award mechanism. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3524. Inquiries: Dr. Karl E. Krueger—kruegerk@mail.nih.gov

Functional Links between the Immune System, Brain Function and Behavior

Announcement Number: PA-06-533
New Application Receipt Dates: Oct. 1, 2006; Feb. 1, June 1, and Oct. 1, 2007; Feb. 1 and June 1, 2008

This is a renewal of PA-05-054 and will use the R21 award mechanism. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3528. Inquiries: Dr. Paige McDonald—mcdonalp@mail.nih.gov ◆



Featured Clinical Trial

Treating Malignant Peripheral Nerve Sheath Tumors

Name of the Trial
Phase II Study of Neoadjuvant Chemotherapy Comprising Doxorubicin Hydrochloride and Ifosfamide Followed by Etoposide and Ifosfamide in Patients with Sporadic or Neurofibromatosis Type 1-Associated High-Grade Unresectable Stage III or IV Malignant Peripheral Nerve Sheath Tumors (NCI-06-C-0043). See the protocol summary at http://cancer.gov/clinicaltrials/NCI-06-C-0043.

Principal Investigator
Dr. Brigitte Widemann, NCI Center for Cancer Research

Dr. Brigitte Widemann

Why This Trial Is Important
Malignant peripheral nerve sheath tumors (MPNSTs) are soft tissue sarcomas that form in the outer layers of peripheral nerves (nerves outside the brain and spinal cord). About half of MPNSTs are found in individuals with a hereditary condition called neurofibromatosis type 1 (NF1). Surgery is the only curative treatment for MPNSTs. The prognosis for patients with unresectable tumors (tumors that cannot be surgically removed) is poor.

In this trial, patients with unresectable MPNSTs will be treated with neoadjuvant chemotherapy followed by surgery and/or radiation therapy and more chemotherapy. Neoadjuvant chemotherapy is given to reduce the size of the MPNSTs prior to the administration of definitive local therapy (surgery and/or radiation therapy). The choice of treatment following neoadjuvant chemotherapy will be based on tumor location and tumor response to the chemotherapy.

"We hope MPNSTs shrink in response to neoadjuvant chemotherapy with doxorubicin, ifosfamide, and etoposide, which are standard agents with proven activity in other pediatric and adult sarcomas," said Dr. Widemann.

"Furthermore, because outcomes for NF1-associated MPNSTs have been reported to be worse compared with sporadic tumors," Dr. Widemann said, "we will evaluate outcomes in the two groups treated with identical therapy to determine if patients with NF1-associated MPNSTs face a worse prognosis."

Who Can Join This Trial
Researchers will recruit 74 patients with newly diagnosed sporadic or NF1-associated high-grade stage III or IV MPNSTs. See the list of eligibility criteria at http://cancer.gov/clinicaltrials/NCI-06-C-0043.

Study Sites and Contact Information
Study sites in the United States are recruiting patients for this trial. See the list of study contacts at http://www.cancer.gov/clinicaltrials/NCI-06-C-0043, or call NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237) for more information. The toll-free call is confidential. ◆

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

Notes

Office of Liaison Activities Redesigns Web Site

NCI's Office of Liaison Activities (OLA) recently launched a newly redesigned Web site at http://ola.cancer.gov. OLA administers several programs for advocates at NCI including the Director's Consumer Liaison Group, the Consumer Advocates in Research and Related Activities program, the Advocacy Outreach program, and NCI Listens and Learns. To sign up for the OLA listserv or to receive OLA's bimonthly newsletter, the *NCI Nealon Digest,* go to http://ola.cancer.gov/programs/advocacy/subscribe.

Presidential Proclamations for Cancer Awareness in September

The White House has issued presidential proclamations designating September as National Ovarian Cancer Awareness Month and National Prostate Cancer Awareness Month. For information on these cancers, go to the following NCI Web sites:

Ovarian Cancer: http://www.cancer.gov/cancertopics/types/ovarian

Prostate Cancer: http://www.cancer.gov/cancertopics/types/prostate

Conference on Interleukin-15 Scheduled for October

The Center of Excellence in Immunology in NCI's CCR and the NIH Cytokine Interest Group are cosponsoring a 1-day symposium, "IL-15: Basic Research and Clinical Applications," from 8:45 a.m. to 4:00 p.m. on October 30. It will be held in Lipsett Ampitheater in Building 10 on the NIH campus. The meeting will feature leaders in this field and discussions of approaches to move IL-15 from bench to bedside. Drs. Tom Waldmann and Howard Young are chairing the meeting, and speakers include Drs. Michael Caligiuri, Averil Ma, Cliff Lane, Jay Berzofsky, David Weiner, Nick Restifo, and Bana Jabri.

Online registration is available at http://web.ncifcrf.gov/events/IL15, and there is no registration fee. Seating is limited, so early registration is encouraged. For additional information, contact Karen Kochersberger at kkochersberger@ncifcrf.gov or 301-228-4027.

"Understanding NCI" Teleconference Slated This Month

Members of cancer advocacy organizations, cancer survivors, family, and friends are encouraged to participate in NCI's OLA's "Fall 2006 Understanding NCI Teleconference Series" to learn more about the institute's cancer research programs and advocate involvement.

The first teleconference, "Update for the Advocacy Community from NCI Director," features NCI Acting Director Dr. John Niederhuber and NCI Director's Consumer Liaison Group Chair Doug Ulman, and is scheduled for September 19 at 1:00 p.m. (EDT). To participate, call 1-800-857-6584 and use the passcode "NCI." The call is toll free, no registration is required, and callers will have the opportunity to ask questions. The toll-free playback can be heard at 1-866-372-3809 through October 19.

For more information on the teleconference series, including previous calls, go to http://ola.cancer.gov/activities/teleconferences. ◆

(Director's Update continued from page 2)
of the program is that about 15 to 20 percent of the awards each year are to new investigators.

Technologies supported through IMAT enable groundbreaking science across NCI. Those tools will allow for more accurate analysis of molecular pathways involved in different cancers, and they will reduce the cost of doing research through smaller sample sizes and the ability to simultaneously analyze multiple intracellular activities.

And, as the work being funded by IMAT so clearly demonstrates, innovative technologies will be essential to our continued progress against cancer.

Dr. John E. Niederhuber
Acting Director
National Cancer Institute

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incidence rates. The data are analyzed by racial and ethnic categories.

The researchers combined information from cancer registries throughout the U.S. that also participate in NCI's Surveillance, Epidemiology, and End Results (SEER) Program and/or the National Program of Cancer Registries, supported by the Centers for Disease Control and Prevention (CDC).

First published in 1998, the report is produced by the American Cancer Society, CDC, NAACCR, and NCI.

"This report pulls together a tremendous amount of information, and it should be viewed as a reference document where people can go to find the latest information on cancer," says co-author Dr. Brenda K. Edwards of NCI's Division of Cancer Control and Population Sciences. ◆

By Edward R. Winstead

Community Update

Cancer Center Directors Report on Accelerating Successes Against Cancer

At the September 7 meeting of the National Cancer Advisory Board, the working group of directors of the NCI-designated Cancer Centers presented its recommendations for "Accelerating Successes Against Cancer."

"Never has there been such opportunity and promise for improving outcomes for patients with cancer," said Dr. John Mendelsohn, president of the University of Texas M.D. Anderson Cancer Center and chair of the group. "Most of the nation's NCI-designated Cancer Centers are imbedded in academic medical centers. Thus, the nation's Cancer Centers are uniquely positioned to both lead in cancer research and lead in the dissemination process."

The recommendations are the result of a November 2005 meeting of NCI's director and the Cancer Center directors. At a follow-up meeting last May, the group presented its preliminary recommendations, which are subdivided into six goal areas for the Cancer Centers to pursue:

Prevention: The recommendations of the National Cancer Policy Board on cancer prevention and early detection, focusing on evidence-based interventions in lifestyle and behavior, should be implemented, as well as scientifically established medical strategies. Research in personalized medicine and behavioral sciences should be increased.

Early detection: Large-scale, collaborative clinical trials should be designed to identify potential markers, followed by clinical trials validating these markers' capacity to predict cancer. Partnerships between cancer centers, government, health care agencies, and advocacy groups should be forged to expand the use of validated screening methods, extend access, and disseminate information.

Treatment: The recommendations of the Clinical Trials Working Group to improve NCI's capacity to coordinate and support innovative clinical research should be implemented, making support of clinical investigators and infrastructure a top priority. Collaborations between cancer centers to design and perform trials and share specialized core services should be increased.

Survivorship: Cancer Centers should collaborate with NCI's Office of Cancer Survivorship to establish a data warehouse of clinical information, research protocols, educational materials, and outreach activities. Centers should also collaborate with the American Society of Clinical Oncology to develop clinical practice guidelines for survivors.

Collaborations: Collaboration between companies and academic institutions should be facilitated by developing shared licensing agreements to speed contract negotiations. Expertise and resources of Cancer Centers should be brought together for collaborative chemoprevention trials.

Dissemination: The medical and financial benefits of cancer control best practices should be demonstrated by establishing projects in regions served by Cancer Centers, funded by the Centers for Medicare and Medicaid Services, and led by the Cancer Centers. Cancer care and control guidelines should be disseminated in collaboration with other agencies.

NCI Acting Director and former Cancer Center Director Dr. John Niederhuber thanked the working group for developing the recommendations. "I applaud the Cancer Center directors for taking the time and putting in the effort to produce this thoughtful report. It now falls on NCI to carefully consider its recommendations and turn them into a plan for action," he noted. ◆

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.