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Virus Selectively Kills Cancer Cells, Study Indicates

A common, benign virus may be a more powerful foe of some cancer cells than previously thought. Research has indicated that the virus, adeno-associated virus type 2 (AAV2), can inhibit the growth of some cancer cells and, in some cases, cause cell death (apoptosis). But researchers from Penn State University recently reported at the annual meeting of the American Society for Virology that, in laboratory cultures, AAV2 entirely wiped out cancer cells of four different types: cervical, squamous cell, breast, and prostate, while leaving healthy epidermal cells intact.

Only single cell lines of breast, squamous cell, and prostate cancer were studied. Not so for human papillomavirus (HPV)-related cervical cancer, explains Dr. Craig Meyers, professor of microbiology and immunology at the Penn State College of Medicine and the lead investigator on the study.

"We did the experiment 30 or 40 times with all different types of [HPV-related] cervical cancer lines: preneoplastic, ...invasive carcinoma, HPV16, HPV18, HPV31," he says. "Every single time, they died at 6 days, like clockwork." The 6-day time frame for cell death held true for all four cell types studied.

AAV2, which is estimated to have infected 80 to 90 percent of the U.S.

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Director's Update

Guest Update by Dr. Robert Croyle

Strengthening the Evidence Base for Quality Cancer Care

One of the most significant challenges in cancer research is connecting the discovery and development of proven cancer therapies with their optimal dissemination and implementation in general clinical practice. Research on cancer care delivery in the community, and the impact of that care on both patients' quality of life and survival, is a critical complement to randomized clinical trials. Evidence concerning delivery can tell us whether clinical trial findings are being applied appropriately in everyday practice and whether cancer patients are receiving the highest possible quality of care—from initial diagnosis through the end of life.

Dr. Robert Croyle
Director, NCI Division of Cancer Control and Populations Sciences

In order to strengthen the evidence base for what constitutes high-quality cancer care, the National Cancer Institute (NCI) launched the 5-year, $34 million Cancer Care Outcomes

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(Virus continued from page 1)

population, appears to recognize the cancer cells as being abnormal, the researchers contend, although they still don't know how or why it takes 6 days before apoptosis sets in.

"With the cervical cancer lines, AAV2 doesn't care if it's preneoplastic or invasive," Dr. Meyers continues. "So it has to be something that happens early in the carcinogenic process. But whatever it is, it remains into the invasive stage."

AAV2, says Dr. Selvarangan Ponnazhagan, an associate professor of pathology at the University of Alabama at Birmingham, is considered to be "replication incompetent," meaning that even after it has infected a cell and integrated into its genome, it needs the assistance of another virus, such as HPV, to replicate and invade its next cellular target.

In terms of AAV2's therapeutic potential, Dr. Ponnazhagan says, "One of the limitations you need to overcome is the ability of the virus to penetrate a good proportion of the tumor cells to have a killing effect."

In this study, however, AAV2 worked without another virus' help, Dr. Meyers notes. His lab has done other work with healthy cells showing the virus can replicate on its own.

Engineered, or recombinant, versions of AAV are increasingly being used as a delivery vehicle for gene therapy approaches to cancer and other diseases. But whether the wild-type (naturally occurring) version of AAV2 could be transformed into a therapeutic presents a number of unanswered questions, says Dr. Peter Beard, a senior scientist at the Swiss Institute for Experimental Cancer Research who has closely studied the virus. Chief among those is just how much virus would be required to have a therapeutic effect *in vivo*.

In addition, says Dr. Doug Lowy, chief of the NCI Laboratory of Cellular Oncology, it's possible that preexisting AAV antibodies or antibodies generated by the introduction of the therapeutic virus might limit its oncolytic activity. Nevertheless, he says, "It's certainly a provocative observation that's in line with previous observations on AAV."

The study results have generated significant interest, says Dr. Meyers. His intent is to conduct further investigations into the intracellular signaling pathways affected by AAV2. He is also working with colleagues at Penn State "to figure out what we need to do to get from the lab to clinical trials," he says. "That's a major goal right now." ◆

(Director's Update continued from page 1)

Research and Surveillance Consortium (CanCORS) project. With an expected enrollment of 11,000 patients with newly diagnosed lung or colorectal cancer, CanCORS is structured to collect data that reflect the entire span of care from diagnosis through end-of-life care, capturing data from patients, their physicians (surveys and medical records from specialists and nonspecialists), and their informal caregivers who provide care during their treatment. Our aim is to determine the factors that influence the interventions that cancer patients actually receive, and then to evaluate the effects of that care on patients' survival, quality of life, and satisfaction with care.

CanCORS includes eight research teams, and a geographically and demographically diverse patient population. Data are being collected from intensive patient interviews, medical records, physician surveys, caregiver surveys, linkages to Medicare claims, and other sources. Although this is an NCI initiative, led by the Applied Research Program in the Division of Cancer Control and Population Sciences, we have many important partners, including the Department of Veterans Affairs and the Centers for Disease Control and Prevention. An external expert panel also has provided valuable advice to the funders and investigators.

CanCORS' power lies in its large sample size, diverse population-based patient sample, and ability to triangulate a rich set of relevant information from multiple sources, such as biological characteristics, treatment details, comorbidities, patient and physician preferences and attitudes, sociodemographic characteristics, and many other potential explanatory factors. This wealth of information provides a unique opportunity to test numerous hypotheses regarding treatment decisions and patient outcomes.

Looking beyond CanCORS, we are developing ideas for moving our knowledge about cancer care quality into promising new areas. For example, future projects could track recently developed therapies, including the integration of molecular studies with quality-of-care studies to predict and assess outcomes. Such efforts would address a high-priority goal at NCI: the integration of molecular biology and population science.

Another critical objective of CanCORS is to uncover the reasons for disparities in cancer care delivery, such as those associated with age and race/ethnicity. Better evidence concerning the reasons for disparities is urgently needed to inform policies and programs designed to reduce them.

We believe CanCORS has the potential to improve the delivery of cancer care by identifying, in a scientifically rigorous manner, the key factors in usual clinical practice associated with high-quality care. For more information about this initiative, visit http://healthservices.cancer.gov/cancors/. ◆

Spotlight

Complementary and Alternative Medicine:
Expanding Approaches to Cancer Treatment

While NCI's Office of Cancer Complementary and Alternative Medicine (OCCAM) is only 6 years old, it embodies a spirit of struggle with cancer that goes back to the early days of NIH in the 1940s, and ultimately to traditions in China and other cultures. NCI is not alone in pursuing the many possibilities of nutritional approaches, botanicals, herbal products, and interventions, such as yoga and acupuncture for the treatment of cancer symptoms and side effects of treatment.

Many of the major cancer centers in the United States have a formal program or center in CAM, which is also known as integrative medicine. Partnerships with and program funding for integrative research centers, at the University of Texas M. D. Anderson Cancer Center, Memorial Sloan-Kettering Cancer Center, and the Dana-Farber Cancer Institute, for example, illustrate that good medicine yields meaningful clinical results.

"NCI created OCCAM in 1998," says Dr. Jeffrey White, director of OCCAM. "We have a big job to do, but fortunately we have many partners. We work with several other NCI programs to expand NCI's ability to extend its search for effective therapies into areas outside the mainstream of conventional biomedical research."

"We also support research and information products which explore the potential value of integrating aspects of general health promotion, such as diet and exercise, into the therapeutic prescription for cancer patients," continued Dr. White.

A recent example is NCI's Selenium and Vitamin E Cancer Prevention Trial (SELECT), the largest study ever conducted on prostate cancer prevention. NCI dollars are being invested to study specific nutritional therapies which appear to reduce risk by as much as 60 percent (selenium) and 30 percent (Vitamin E). Also, only a large clinical trial like SELECT can provide the kind of data that individuals from both the East and the West respect.

From less than $30 million in FY 1998, NCI's CAM research portfolio has grown to $129 million in FY 2004, which goes to more than 400 projects in the form of intramural projects, grants, cooperative agreements, supplements, or contracts. Recently, several aspiring CAM researchers attended a workshop in Bethesda, Md., to learn how to win such support for their own projects.

Dr. Wendy B. Smith, OCCAM's deputy director, noted that CAM cuts across disease types and has a role in cancer prevention, diagnosis, and treatment, as well as in managing the side effects of conventional cancer treatments and enhancing the quality of life of cancer survivors.

Dr. Smith also serves as director of the office's Research Development and Support Program. "Emphasizing methodology is crucial because it can provide a solid foundation for the field. CAM research can be just as rigorous as any other," she explained. "Unfortunately, the debates often revolve around methods, not results."

Dr. Lorenzo Cohen, who directs the Integrative Medicine Program at M.D. Anderson, agrees. He works with faculty from multiple departments there and collaborates with other Texas institutions. Recently, he led an OCCAM-supported project to create the International Center of Traditional Chinese Medicine for Cancer, a partnership between M.D. Anderson and the Cancer Hospital at Fudan University in China. "Many of our drugs come from the Chinese pharmacopeia," said Dr. Cohen, "and we hope open communication and exchange of ideas will allow Western practitioners to learn about concepts of traditional medicine while exposing Chinese practitioners to our approach to clinical research."

Another of OCCAM's areas of interest is the mind-body connection. Dr. David Rosenthal, past president of the American Cancer Society (ACS), became the first medical director of Dana-Farber's Leonard P. Zakim Center for Integrated Therapies. "There's no question that the mind-body programs increase a person's sense of well-being and relaxation, thus making them better able to tolerate and accept their therapy," he said.

Dr. Rosenthal became an advocate for CAM, and his involvement accelerated while at the helm of ACS. He continues to advocate for the inclusion of evidence-based CAM into U.S. medical practice in his current position as president of the Society for Integrative Oncology.

For more information on NCI's activities in CAM, funding opportunities, and upcoming workshops, see http://www.cancer.gov/cam. ◆

Cancer Research Highlights

PLCO Publishes Sigmoidoscopy Results

Some 23 percent of the participants aged 55 to 74 in NCI's Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial have at least one polyp or mass in their lower colons, according to results from the largest study to date of flexible sigmoidoscopy. The study, published in the July 6 *Journal of the National Cancer Institute*, also found that 83 percent of participants who were offered sigmoidoscopy agreed to the procedure, which the authors characterize as a high rate of acceptance.

Starting in 1993, some 155,000 people enrolled in the PLCO Trial, which is being conducted at 10 centers nationwide. Half of the participants were offered screening sigmoidoscopy, and the other half maintained usual care with their own physicians. After the screening, patients with polyps or masses were referred to their primary physicians for follow-up. Twenty-eight percent of men were referred for follow-up visits, compared with 18 percent of women.

One year after the initial screening, 1.8 per 1,000 women and 2.9 per 1,000 men had been diagnosed with colorectal cancer, usually after colonoscopy and biopsy.

Women turned down sigmoidoscopy more often than men, with women older than 70 having the highest rejection rate.

Dr. Paul Pinsky, of NCI's Division of Cancer Prevention, said that the figures establish a benchmark for what could be expected if a large-scale flexible sigmoidoscopy screening program was undertaken in the United States. He said the study's large population and broad geographic catchment area, as well as the fact that diagnostic follow-up was carried out by independent health care providers not associated with the trial, make it more representative of actual practice than most other screening trials. However, he noted that the study population was somewhat less diverse and more educated than the U.S. population as a whole.

The PLCO Trial will eventually show whether screening reduces the death rate from the four cancers being studied.

Women's Health Study Finds No Anticancer Benefit of Aspirin and Vitamin E

Taking low doses of aspirin every other day for 10 years did not protect women against cancer, the largest clinical trial of aspirin in cancer prevention has found. The dose was 100 mg every other day. Higher doses of aspirin may have protective effects, the researchers say, but increasing the dose could potentially lead to side effects in some individuals.

"The results at this time do not support the use of low-dose aspirin for cancer prevention," says Dr. Nancy Cook of the Brigham and Women's Hospital in Boston, lead author of the study published online in the July 6 *Journal of the American Medical Association (JAMA)*.

The findings are from the Women's Health Study, a randomized trial that evaluated the protective effects of aspirin and vitamin E on cancer and cardiovascular disease among 40,000 women aged 45 and over. Participants were free of cancer and cardiovascular disease at the start of the study.

No benefit was detected for the cancers examined, including breast and colon, but the researchers cannot rule out the possibility that aspirin may protect against lung cancer. Two studies in men have reported similar findings, but "the evidence for such an effect remains uncertain," the researchers write.

A companion report in *JAMA* from the Women's Health Study found no evidence that taking 600 IU of vitamin E every other day for 10 years protects women against cancer. "The best recommendation for the prevention of cancer and cardiovascular disease is to follow a healthy lifestyle," notes Dr. Cook.

"Freckling" Gene Associated with Melanoma Risk in Italian Population

A new study reports that certain variants of a gene involved in regulating pigmentation are associated with an increased risk of melanoma in an Italian population, as they are among lighter-skinned populations in Northern Europe. The variants were strongly associated with melanoma risk in both the familial and noninherited, or sporadic, forms of the disease in the Italian population.

The melanocortin-1 receptor *(MC1R)* gene, also known as the "freckling" gene, comes in dozens of forms. Some variants, like those typically found in people with red hair, have been linked to the risk of melanoma, but this was the first study to test associations between the variants and melanoma in a Mediterranean population.

After the researchers took into account known risk factors, such as hair

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color, tanning ability, and the presence of moles, some unexplained risk remained. In fact, the risk of melanoma tended to be higher among individuals with fewer known risk factors, according to findings in the July 6 *Journal of the National Cancer Institute*.

"*MC1R* is a very interesting gene," says Dr. Maria Teresa Landi, of NCI's Division of Cancer Epidemiology and Genetics, who led the research. "We believe it is important for pigmentation, but its effects on the risk of melanoma extend beyond pigmentation. We and others are trying to understand these effects."

The *MC1R* variants were also associated with the thickness of melanoma, which is an indicator of disease progression. In contrast, the researchers found no association in this population between melanoma risk and a variant of the Agouti Signaling Protein gene, which is also involved in pigmentation. The study included 276 melanoma patients and 382 people without the disease in northeastern Italy.

During Pregnancy, Chemotherapy for Breast Cancer Is Safe

During the second and third trimesters of pregnancy, chemotherapy can be given to women who have breast cancer with minimal risk of peripartum complications or serious adverse effects on the fetus. These are the results of a retrospective study published in the June 20 *Journal of Clinical Oncology*.

The study included 28 women who had been treated for breast cancer with chemotherapy during pregnancy at any of five London hospitals between 1986 and 2003. Sixteen of the women received anthracycline-based chemotherapy during treatment, while the remaining 12 received cyclophosphamide, methotrexate, and fluorouracil.

One woman who was treated during the first trimester of her pregnancy miscarried. Among the remaining women, 22 were in their second trimester and 5 were in their third trimester. Analysis showed a median gestational age at delivery of 37 weeks; the infants were within normal birthweights and had no significant fetal abnormalities.

Based on similar studies—one of which included long-term follow-up data showing no malignancies in the children of women who underwent chemotherapy during pregnancy—the authors suggest that chemotherapy during the second and third trimesters of pregnancy could also be safe for babies in the long term. But they note that large prospective studies are needed to confirm this trend. "Nonetheless," they write, "on the basis of the current evidence, women should not be denied the potential benefits of chemotherapy because they are pregnant at the time of diagnosis of breast cancer."

Adjuvant Capecitabine Effective Against Colon Cancer

The standard adjuvant treatment for metastatic colon cancer is a combination of the drugs fluorouracil plus leucovorin. But depending on how the drugs are administered, side effects can include diarrhea, a weakened immune system, and inflammation of the mucous tissue in the mouth. To see whether capecitabine (Xeloda), an established first-line treatment for metastatic disease, could be used as an alternative adjuvant treatment with fewer negative side effects, an international coalition of researchers recruited 1,987 patients with resected stage III colon cancer to the X-ACT clinical trial. Their results are published in the June 30 *New England Journal of Medicine*.

After 24 weeks of treatment and a median follow-up period of 3.8 years, patients in the capecitabine group showed disease-free survival that was at least equivalent to those in the fluorouracil-plus-leucovorin group. They also showed longer relapse-free survival, with 65.5 percent of the patients remaining relapse free after 3 years, compared with 61.9 percent of those in the fluorouracil-plus-leucovorin group.

In addition, patients in the capecitabine group had fewer treatment-related side effects, including nausea, diarrhea, vomiting, hair loss, and a weakened immune system. There was one exception: incidence of grade 3 hand-and-foot syndrome—a condition where the skin on patients' palms and soles of their feet becomes red and tender, and may peel—was significantly higher in the capecitabine group.

"Our results support capecitabine as an alternative to fluorouracil plus leucovorin in the adjuvant treatment of colon cancer," the authors write. "Capecitabine or oxaliplatin-based therapy should be considered for all patients requiring adjuvant therapy for colon cancer."

Incidence of Inflammatory Breast Cancer May Be Rising, Study Suggests

A relatively rare and aggressive form of breast cancer called inflammatory breast cancer (IBC) may be slightly more common among women in the United States today than it was 15 years ago, according to an analysis of more than 180,000 breast cancer cases diagnosed between 1988 and 2000. This form of breast cancer is characterized by redness, warmth, and swelling, often without an underlying palpable mass.

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(Highlights continued from page 5)

The incidence of IBC increased from 2 cases per 100,000 to 2.5 cases per 100,000 between 1988 and 1999, according to findings in the July 6 *Journal of the National Cancer Institute*. (By comparison, during the same period, the incidence of more common forms of breast cancer decreased from 108 cases per 100,000 to 101 cases per 100,000.)

The reasons for the apparent increase are unclear, but it will be important to determine whether the incidence is actually rising, or whether IBC is simply better recognized today than in the past, comments Dr. Paul Levine, of the George Washington University Cancer Institute, who led the study with Dr. Kenneth Hance of NCI's Division of Cancer Prevention.

The true incidence of IBC has long been unclear. In this study, the researchers developed a "case definition" of the distinct clinical and pathological characteristics of IBC. They then surveyed the Surveillance, Epidemiology, and End Results (SEER) Program database and determined that 2 percent of breast cancer cases appeared to be IBC. Despite modest improvements in IBC survival throughout the 1990s, the authors observed significant racial disparities in which the incidence was higher and survival was worse among African American compared with Caucasian IBC patients.

Improved methods of recognizing IBC will help researchers classify patients, identify subtypes of disease, and discover molecular "signatures" for diagnostic and prognostic purposes. "Getting a molecular handle on the tumor is very important," notes Dr. Levine, who has developed an IBC registry and tissue repository. ◆

Featured Clinical Trial

Chemotherapy and Biological Therapy for Advanced Mesothelioma

Name of the Trial

Phase II Randomized Study of Gemcitabine and Cisplatin with or without Bevacizumab in Patients with Malignant Mesothelioma (UCCRC-11046A). See the protocol summary at http://cancer.gov/clinicaltrials/UCCRC-11046A.

Principal Investigator

Dr. Hedy Kindler, University of Chicago Cancer Research Center

Dr. Hedy Kindler

Why Is This Trial Important?

Malignant mesothelioma is a rare cancer of the lining of the lungs, the heart, or the abdomen (the pleura, pericardium, or peritoneum). If diagnosed at the earliest stage, mesothelioma can be cured by surgery and treatment with chemotherapy or radiation therapy. However, advanced mesothelioma is usually inoperable and is rarely curable.

In this study, researchers are adding a biological agent called bevacizumab (Avastin) to chemotherapy to see if it can help delay the progression of mesothelioma in patients with advanced disease. Bevacizumab is a monoclonal antibody that blocks the action of a protein called vascular endothelial growth factor (VEGF). In mesothelioma, VEGF may stimulate both tumor cell growth and the formation of tumor blood vessels.

"Bevacizumab has shown promise in several other types of cancer, and we hope that it will be particularly effective against mesothelioma because VEGF plays such a prominent role in the growth of this disease," said Dr. Kindler. "Additionally, bevacizumab works synergistically with chemotherapy, so combining these treatments may yield better results than either chemotherapy or biological therapy alone."

"Because mesothelioma is an orphan disease, there often isn't the incentive to pursue new therapies for it, so we are very pleased that NCI is supporting such a study," Dr. Kindler added.

Who Can Join This Trial?

Researchers seek to enroll 106 patients aged 18 and over with malignant mesothelioma that cannot be removed by surgery. See the list of eligibility criteria for this trial at http://cancer.gov/clinicaltrials/UCCRC-11046A.

Where Is This Trial Taking Place?

Multiple study sites in the United States are recruiting patients for this trial. See the list of study sites at http://cancer.gov/clinicaltrials/UCCRC-11046A.

Contact Information

See the list of study contacts at http://cancer.gov/clinicaltrials/UCCRC-11046A or call the NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237). The call is toll free and completely confidential. ◆

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

Notes

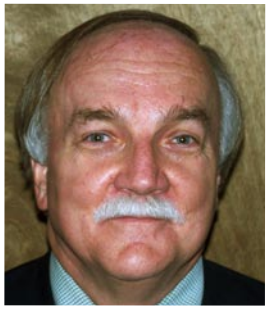
NCI Staff Present at PACHA Meeting

On June 20, Dr. James Goedert of DCEG and Dr. Robert Yarchoan of the Center for Cancer Research presented information about cancer in individuals with HIV/AIDS to the Presidential Advisory Council on HIV/AIDS (PACHA).

Dr. Goedert noted that the outbreak of Kaposi's sarcoma (KS) among homosexual men in New York and California began in 1981. In 1996, the introduction of highly active antiretroviral therapy (HAART) increased the lifespan of HIV-infected patients. At the same time, the development of HAART contributed to an increase in the number of people living with AIDS. Currently 1 million HIV-positive individuals reside in the United States; half of them have AIDS. HAART is also affecting the spectrum of malignancies in HIV-positive patients. Data from the AIDS Cancer Match Registry, which currently links 465,000 people with HIV/AIDS to population-based cancer registries in 6 metropolitan areas and 7 states, indicate that the incidence of KS and some types of non-Hodgkin's lymphoma has decreased, but the risk remains substantially elevated. Emerging malignancies, including Hodgkin's lymphoma and anal, liver, and lung cancer are on the rise.

Dr. Yarchoan described the difficulties and opportunities in developing appropriate treatments for cancer in the context of HIV infection and HAART therapy. He noted that such patients have two complex life-threatening disorders, and this poses substantial challenges in developing, assessing, and delivering optimal therapy. The genesis of cancer in this population represents potential opportunities to study those factors in carcinogenesis, while changes in the treatment of HIV will require new therapeutic considerations. Most AIDS-associated malignancies are caused by oncogenic viruses, which present unique opportunities for targeted therapies. These approaches may also prove useful in treating viral-induced tumors arising in immune-competent patients.

Tomaszewski Named Deputy Director of DCTD



Dr. Joseph E. Tomaszewski has been named deputy director of NCI's Division of Cancer Treatment and Diagnosis (DCTD). Since May 2004, he has served as the acting associate director of DCTD's Developmental Therapeutics Program while simultaneously overseeing the Toxicology and Pharmacology Branch, where he served as chief for the past 14 years.

"As the division advances its efforts to lead the development of novel cancer therapies nationally, Dr. Tomaszewski will play a critical role in helping DCTD move these new compounds forward seamlessly and quickly," said Dr. James Doroshow, director of DCTD. "His broad expertise in therapeutics development will be essential in this process."

Retiring BSA Members Honored

Four retiring members of NCI's Board of Scientific Advisors (BSA) were honored at the meeting on June 27 by NCI Director Dr. Andrew C. von Eschenbach and BSA Chair Dr. Robert Young of Fox Chase Cancer Center.

Drs. Neil J. Clendeninn, a clinical pharmacology consultant; Thomas Curran of St. Jude Children's Research Hospital; William G. Kaelin, Jr., of Dana-Farber Cancer Institute; and Christine A. Miaskowski of the University of California, San Francisco concluded their 4-year BSA terms at this meeting. Dr. Young praised their commitment to excellence in cancer research, as well as their contributions to BSA during their terms. ◆

Special Issue on Cancer Communications

Next week, the *NCI Cancer Bulletin* will publish its second special issue of 2005. The issue will highlight NCI's communications history, research, and initiatives, and will provide helpful communications resource links for the media, educators, physicians, advocates, and scientists.

NCI Cancer Bulletin special issues have traditionally been the most popular among our readership. Past special issues have focused on the NIH Clinical Center, NCI's Office of International Affairs, and the NCI Cancer Centers Program.

Special issues planned for the future include:

- Community Clinical Oncology Programs (CCOPs)
- NCI Training Programs and Opportunities

Community Update

Cancer.gov Unveils New User-Friendly Drug Dictionary

The latest enhancement to NCI's award-winning Web site is the NCI Drug Dictionary (www.cancer.gov/drugdictionary). Approximately 500 drugs and biologic agents currently being used in cancer clinical trials are listed in the dictionary. The dictionary will soon grow to include additional categories of drugs and agents.

The NCI Drug Dictionary provides brief, accurate descriptions of cancer-related drugs and biologic agents, including information about chemical class and mechanism of action. "Although this dictionary is designed for health professionals, we hope that others who are either involved in or have an interest in cancer therapeutics, including patients, will find it useful," said Dr. Richard Manrow, associate director of the Office of Cancer Content Management in NCI's Office of Communications. Dr. Manrow also commented that NCI's Office of Communications plans to greatly expand the amount of drug information for lay readers on NCI's Web site. "Drugs as a category are second only to types of cancer in searches performed on NCI's Web site," Dr. Manrow said.

A link to the NCI Drug Dictionary is located in the Quick Links box on the left side of most Web pages on www.cancer.gov, as well as on drug information pages.

The NCI Drug Dictionary contains several useful features:

- Flexible search options—In addition to a standard "starts with" search option, users can also enter only a part of a word or term, and use a "contains" option. Users can also search by generic name, brand name, chemical structure name, FDA Investigational New Drug name, or Cancer Chemotherapy National Service Center number, which is NCI's internal drug identification number.
- Browsing functionality—Users who want to browse the dictionary can select a letter of the alphabet and browse drug or agent names (generic and U.S. brand names) that begin with that letter.
- Links to clinical trials—Many drug entries in the dictionary include links to current clinical trials listed in NCI's Physician Data Query (PDQ®) cancer clinical trials registry in which those drugs are being used. This cross-indexing of NCI Drug Dictionary and PDQ clinical trial entries will become much more comprehensive in the future.

Each entry in the NCI Drug Dictionary draws on and provides a link to more detailed information available in the NCI Thesaurus™, which also contains information on relationships to specific cancers, molecular targets, and other drugs, as well as links to other drug information resources. The NCI Thesaurus also contains information on more than 3,000 other cancer-related drugs and agents. The Thesaurus is developed and maintained by NCI Enterprise Vocabulary Services, a joint effort by NCI's Office of Communications and Center for Bioinformatics to help meet the terminology needs of NCI and its partners. ◆

Featured Meetings and Events

A calendar of scientific meetings and events sponsored by the National Institutes of Health is available at http://calendar.nih.gov/cgi-bin/calendar ◆

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.

NCI Cancer Bulletin staff can be reached at ncicancerbulletin@mail.nih.gov.