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Eliminating the Suffering and Death Due to Cancer

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Study Shows Link Between Antibiotic Use and Increased Risk of Breast Cancer

A study published this week in the *Journal of the American Medical Association (JAMA)* provides evidence that use of antibiotics is associated with an increased risk of breast cancer. The authors concluded that the more antibiotics the women in the study used, the higher their risk of breast cancer.

The results of this study do not mean that antibiotics cause breast cancer. They only show that there is an association between the two. Additional studies must be conducted to determine whether there is a direct cause-and-effect relationship.

The authors of the study found that women who took antibiotics for more than 500 days or had more than 25 prescriptions over an average period of 17 years, had more than twice the risk of breast cancer as women who had taken no antibiotics. The risk was smaller for women who took antibiotics for fewer days.

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Director's Update

National Survey Data Released for Analysis: How Americans Seek and Use Cancer Information

The continuing expansion and development of information delivery systems has given people access to cancer information from numerous sources, each varying substantially in quality and reliability. We know that people's prior knowledge, beliefs, and experiences influence the way they interpret and use health information and that America's increasing cultural diversity challenges health communication activities. Yet, until now, we've known little about how people seek cancer information or how to bridge the substantial gaps between the information they want and need, and what they receive.

Today, NCI unveils the first dataset from our Health Information National Trends Survey (HINTS). The first survey of its kind, HINTS collects nationally representative data on the American public's need for, access to, and use of cancer information. The

Dr. Robert T. Croyle, Director of NCI's Division of Cancer Control and Population Sciences

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However, even women who had between 1 and 25 prescriptions had an increased risk; they were about 1.5 times more likely to be diagnosed with breast cancer than women who didn't take any antibiotics. The authors found an increased risk across all classes of antibiotics that they studied.

To gather the necessary data, the researchers used computerized pharmacy and breast cancer screening databases at Group Health Cooperative (GHC), a large, nonprofit health plan in Washington state. They compared the antibiotic use of 2,266 women with breast cancer to similar information from 7,953 women without breast cancer. All the women in the study were aged 20 and older, and the researchers examined a wide variety of the most frequently prescribed antibiotic medications.

The authors offered a few possible explanations for the observed association between antibiotic use and increased breast cancer risk. Antibiotics can affect bacteria in the intestine, which may impact how certain foods that might prevent cancer are broken down in the body. Another hypothesis focuses on antibiotics' effects on the body's immune response and response to inflammation, which could also be related to the development of cancer. It is also possible that the underlying conditions that led to the antibiotics prescriptions caused the increased risk, or that a weakened immune system—either alone, or in combination with the use of antibiotics—is the cause of this association.

The results of the study are consistent with an earlier Finnish study of almost 10,000 women. Further studies must be conducted, however, to understand why the researchers saw this increased risk with antibiotic use. Studies are also necessary to clarify whether specific indications for antibiotic use, such as respiratory or urinary tract infection, or times of use, such as adolescence or menopause, are associated with increased breast cancer risk. Additionally, breast cancer risks could differ between women who take low-dose antibiotics for a long period of time and women who take high-dose antibiotics only once in a while.

Antibiotics are regularly prescribed for conditions such as respiratory infections and acne, in addition to a wide range of other conditions or illnesses. In the *JAMA* study, for example, more than 70 percent of women had used between 1 and 25 prescriptions for antibiotics to treat various conditions over an average 17-year period, and only 18 percent of women in the study had not filled any antibiotic prescriptions during their enrollment in the health plan.

Over the past decade, overuse of antibiotics has become a serious problem. According to the Centers for Disease Control and Prevention, tens of millions of antibiotics are prescribed for viral infections that are not treatable with antibiotics, contributing to the alarming growth of antibiotic resistance.

"Until we understand more about the association between antibiotics and cancer," said co-author Dr. Stephen H. Taplin of NCI's Division of Cancer Control and Population Sciences and formerly of GHC, "people should take into account the substantial benefits that antibiotics can have, but should continue to use these medicines wisely." ◆

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data identify changing communication trends and practices; provide updates on changing information patterns, needs, and opportunities; assess cancer information access and usage; and provide insight about how cancer risks are perceived. The survey began in 2001 and is conducted every two years.

Over the last several months, NCI behavioral and communication scientists have taken a first look at the HINTS dataset and are exploring several important questions that will better equip us to achieve NCI's goal of reducing the suffering and death due to cancer by 2015. They are investigating issues such as the perceived credibility of information sources, perceptions of cancer risks, information factors influencing screening practices, fatalism about cancer prevention, and factors that influence awareness of NCI's Cancer Information Service.

We invite members of our research community to delve into the data and help us learn how people seek and use cancer information. Visit http://cancer.gov/hints to register, download, and use the data.

While this message conveys our excitement about the HINTS data release, we understand that data analyses are only a first step in using the survey to its fullest potential. We look forward to helping communication practitioners learn more about what HINTS tells us about information-seeking behaviors and how together we can use that knowledge to inform our activities. In both research and practice, cancer communications remains a high priority at NCI. ◆

This guest editorial was written by Dr. Robert T. Croyle, Director, Division of Cancer Control and Population Sciences, NCI

Cancer Research Highlights

NCI Scientists Elucidate Key Proteins Involved in Metastasis

In the Jan. 4 advance online publication of *Nature Medicine*, two NCI research groups reported their identification of two important proteins involved in metastasis.

In the first study, NCI's Dr. Yanlin Yu, Dr. Javed Khan, and colleagues used microarray-based expression profiling of highly and poorly metastatic rhabdomyosarcoma cell lines. This analysis identified two genes, ezrin and the developmental transcription factor Six-1, as playing central roles in metastasis. Ezrin links the cell membrane with the actin cytoskeleton, thereby allowing a cell to interact with its microenvironment. It had previously been implicated in metastasis based on its role in signal transduction. Six-1 had previously been reported as a cell cycle regulator.

The researchers verified their findings *in vivo* by injecting cells that overexpress ezrin and Six-1 into nude mice. Though Six-1 was shown to increase tumor cell proliferation and invasiveness *in vitro*, the pathway by which it influences metastasis remains to be elucidated.

In the second study, led by Dr. Chand Khanna of NCI, ezrin was found to be necessary for osteosarcoma metastasis as well. The authors' findings were based on studies in mouse and dog models, as well as examination of tissue from pediatric osteosarcoma patients. The researchers suggested that ezrin played multiple roles in early metastasis and might therefore be a potential target for future antimetastatic therapies.

Guidelines for Diagnosis of Lynch Syndrome (HNPCC) Revised

A revision of the criteria for diagnosing individuals with Lynch syndrome, also known as hereditary nonpolyposis colorectal cancer (HNPCC), will be announced in the Feb. 18 issue of the *Journal of the National Cancer Institute* (*JNCI*). HNPCC is an autosomal dominant—only one parent must have an abnormal gene on one of the autosomal chromosomes in order for the child to inherit the disease—type of cancer predisposition syndrome that is characterized by early onset (typically before age 45 years), the development of neoplastic lesions in a variety of tissues, and microsatellite instability (MSI), a term used to describe mutations in short repetitive sequences of DNA.

The update of the guidelines is based on findings presented at an international workshop on Lynch syndrome (HNPCC) and MSI held at NCI in 2002. The recommendations for determining populations that should be screened by MSI testing were based on factors including age, familial history, genetic analysis, and the biochemical nature of detected tumors. MSI in colorectal cancers is caused by mutations in DNA repair genes, and it has been estimated that 15 percent of all colorectal cancers have MSI.

The guidelines are a revision of those developed at a meeting in Bethesda in 1996. These guidelines include criteria for identifying colorectal tumors that should be tested for mutations in one of the DNA mismatch repair genes. This testing provided information on the performance, specificity, and sensitivity of the guidelines, which was then used to form the revised Bethesda Guidelines. "With recent advances in biochemistry and genome sequencing, it became obvious to us that we had to revisit the Bethesda Guidelines," explained Dr. Asad Umar of NCI's Division of Cancer Prevention, organizer and first author of the *JNCI* report. "Now that we know the nature of the genes involved in microsatellite instability, our next step is to focus more on understanding the actual molecular defects involved in these processes."

Founder Mutation Identified in Patients with HNPCC

Researchers from Creighton University reported last week that they identified a hereditary genetic mutation that "may turn out to account for a significant proportion" of cases of HNPCC in the United States. In the NCI-funded study, published in the Feb. 11 *Journal of the American Medical Association*, the research team analyzed the genealogical history of nine families with a history of HNPCC from distinct geographic areas of the United States. They identified 61 family members from 14 states with an identical mutation in the MSH2 gene. The mutation is the first HNPCC "founder mutation" in a large, outbred population in the United States, said study co-author Stephanie M. Coronel.

Of the approximately 950,000 new cases of colorectal cancer worldwide each year, 10 percent are estimated to be hereditary. HNPCC is the most common form of hereditary colorectal cancer, and individuals with HNPCC are also at extremely high risk of a number of other cancers, including endometrial and ovarian.

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In a person with a founder mutation, his or her offspring have a 50 percent chance of inheriting the mutation. Cases of breast cancer among Ashkenazi Jews, for example, are the result of founder mutations in the BRCA1 and BRCA2 genes. Although genetic screening "is becoming a standard of care" in people from families with a history of HNPCC, the researchers explained that, in this study, the standard genetic sequencing "and other commonly used genetic testing methods" performed poorly in detecting the mutations identified in the 61 individuals.

"An assay for this specific mutation should be added to routine MSH2 testing in the United States," the researchers concluded. "Previously tested families with HNPCC for which no mutation was found should be retested for this specific mutation."

In related news, researchers from the NCI Division of Cancer Prevention and the NCI Center for Cancer Research have published an overview of revised Bethesda Guidelines for testing HNPCC in the Feb. 18 issue of the *Journal of the National Cancer Institute (JNCI)*.

FDA Approves Erbitux for Refractory Metastatic Colon Cancer

The Food and Drug Administration (FDA) last Thursday approved cetuximab (Erbitux®) for use in conjunction with irinotecan-based chemotherapy to treat patients with refractory metastatic colon cancer. The approval is primarily based on the results of clinical trial data that showed treatment with cetuximab and irinotecan shrank tumors in more patients and delayed tumor progression longer than cetuximab alone. Cetuximab is a monoclonal antibody that targets epidermal

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Special Report

Sarcoma PRG Report Calls for Aggressive Action

The final report and recommendations of the Sarcoma Progress Review Group (PRG) released late last month, calls for the formation of a Sarcoma Research Consortium (SRC) that will serve as a guide for sarcoma clinical trials and related basic and clinical research. The SRC would also enhance the network of investigators and cancer centers committed to sarcoma research.

Although the report recommends specific actions in six priority areas, the PRG decided that the formation of an SRC is paramount to success and effectively outweighs the other priorities. The need to create the SRC served as "a unifying theme" of the recommendations, the report states. "Implicit in the creation of the SRC is the notion that specialized expertise in sarcoma patient care and/or sarcoma research is required to move the field forward," the report continues. "The intent is not, however, to create a structure that is exclusive. Rather, the SRC represents an organizational umbrella that can accommodate and, indeed, welcomes participation by any investigator or center committed to sarcoma research."

The establishment of the SRC, the report states, would 1) assemble a national, multidisciplinary group of investigators to provide leadership for sarcoma research, 2) establish centers of excellence for sarcoma research, and 3) provide a common infrastructure to support and accelerate research (by establishing a centralized sarcoma and tissue repository, for example).

The PRG was co-chaired by Dr. Karen Antman of the Herbert Irving Comprehensive Cancer Center at Columbia University (see "A Conversation with..." page 5), Dr. Todd Golub of the Dana-Farber Cancer Institute, and Dr. Lee Helman, Chief, Pediatric Oncology Branch, Center for Cancer Research, NCI.

Although sarcomas—cancers that form in connective tissues like blood vessels, bones, and cartilage—account for about 1 percent of adult malignancies, they are more common in children, representing about 15 percent of pediatric malignancies. Because of misdiagnoses, they are probably undercounted. The misdiagnosis problem has been exacerbated by the current diagnostic coding systems, the report states, which categorize cancers by their location in the body, something that does not work well for sarcomas. The report cites, for example, a form of sarcoma called gastrointestinal stromal tumor (GIST), which was once thought to be rare. A recent review of 1,500 intra-abdominal tumors for a GIST genetic marker turned up 400 cases. Of these 400, only 100 cases initially had been diagnosed as GIST, with the remainder diagnosed as other sarcoma subtypes.

In addition to misdiagnoses, improvements in treatment also have been plagued by late diagnoses, a

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poor understanding of risk factors for sarcomas, and limited effectiveness of currently available therapies. Sarcoma diagnosis, for instance, "is delayed in many patients by the lack of experience of primary physicians, who often attribute the initial mass to common benign lesions," the report explains. There is also no uniform standard of care for sarcomas, which has yielded "wide variations" both in treatment and outcomes.

Other priority areas identified by the PRG include:

- Funding and fostering research in specific areas of sarcoma biology that are most likely to yield needed advances or where there are significant knowledge gaps, such as the developmental biology of mesenchymal tissues.
- Developing sarcoma-specific animal model systems.
- Funding and fostering comprehensive approaches to sarcoma profiling and target discovery.
- Developing a centrally available toolkit of core reagents and access to important technology platforms (e.g., cell lines, biomarkers).
- More strategically designed clinical trials.

As with past PRGs (11 have been convened over the past 7 years), the Sarcoma PRG solicited extensive input from the research and advocacy communities to examine NCI's research portfolio as well as research funded by other institutes and organizations. NCI will now review the recommendations—available at http://prg.nci.nih.gov/pdfprgreports/2004sarcoma.pdf—and, with guidance from internal working groups, implement initiatives that respond to them.

Additional information about and reports from each of the PRGs may be found at http://prg.nci.nih.gov. ◆

A Conversation with Dr. Karen Antman

Dr. Karen Antman, director of Columbia University Medical Center's Herbert Irving Comprehensive Cancer Center and chief of the division of medical oncology, co-chaired the recent Sarcoma Progress Review Group (PRG), which released its recommendations for advancing diagnosis and treatment of sarcomas on Jan. 23 (see Special Report, page 4). Dr. Antman shares her thoughts on the report with the *NCI Cancer Bulletin*.

Dr. Karen Antman
Co-chair, Sarcoma Progress Review Group

The recommendation to create a Sarcoma Research Consortium (SRC) was singled out as the top priority among the six priority areas you identified. Why is this so important, in your mind?

Sarcoma research in the United States is extremely fragmented at the moment. The establishment of a Sarcoma Research Consortium is essential to ensuring that there is greater coordination of sarcoma research and greater collaboration among sarcoma researchers.

There were five other priorities identified in addition to the consortium. Are there any that, if implemented, will "bear fruit" more quickly?

More strategically designed clinical trials would most likely have the most immediate impact, with accrual from all of the United States and perhaps Canada. Developing better tissue resources and a central tool kit, so that researchers have access to these and don't have to accumulate resources, would also be of immediate help. Certainly just getting accurate numbers for sarcoma incidence and mortality would be very beneficial.

The process for conducting a PRG appears to be quite robust and rigorous. In the case of the Sarcoma PRG, a 3-day, 112-participant roundtable helped identify and develop the priority areas. What are the benefits of having this issue addressed through such a process, as opposed to a review by a smaller, less inclusive group?

We purposely included some people with expertise in areas such as communication, epidemiology, and animal models who were not known for their sarcoma work but were respected as thoughtful and creative. This is an advantage of including a wider group. After the discussions, some of these people may even develop an interest in sarcomas. Not enough has been done in sarcoma epidemiology, outcomes, or imaging, so we also had group members with these backgrounds to accelerate discussion in these areas. ◆

Featured Clinical Trial

Antiangiogenic Therapy for High-Grade, Recurrent Brain Tumors

Name of the Trial

Phase II Study of LY317615 in Patients with Recurrent High-Grade Gliomas (NCI-03-C-0018). See the protocol summary at http://cancer.gov/clinicaltrials/NCI-03-C-0018.

Principal Investigator

Dr. Howard A. Fine, chief of the Neuro-Oncology Branch at NCI's Center for Cancer Research.

Dr. Howard A. Fine
Principal Investigator

Why Is This Trial Important?

Glioma, a type of brain cancer, is the most common primary tumor of the central nervous system. Surgery is often used to treat gliomas. Sometimes, however, surgery fails to cure the disease. In these cases, doctors may turn to radiation or chemotherapy.

A chemotherapy drug known as LY317615 may stop the growth of gliomas by halting blood flow to the tumor, a process called antiangiogenesis. This trial seeks to establish the tumor-fighting ability of LY317615 in patients with high-grade, recurrent gliomas and assess the side effects the drug may have on patients.

"Recurrent malignant glioma is a desperate disease for which there are very few adequate treatments," said Dr. Fine. "This drug could be a highly potent therapy, though, because preclinical studies show that it may have both an indirect antiangiogenic effect as well as a direct cancer-killing effect on gliomas. Early results have already demonstrated the ability of LY317615 to stop the growth and shrink the tumor in some patients.

"Additionally, the trials of LY317615 to date have shown that the agent has minimal side effects," he said.

Who Can Join This Trial?

This trial seeks to enroll 110 patients aged 18 and over with high-grade, recurrent gliomas. See the full list of eligibility criteria for this trial at http://cancer.gov/clinicaltrials/NCI-03-C-0018.

Where Is This Trial Taking Place?

The study is taking place at the National Institutes of Health (NIH) Warren G. Magnuson Clinical Center in Bethesda, MD.

Who to Contact

For more information about this study, visit the Neuro-Oncology Branch Web site at http://home.ccr.cancer.gov/nob or call the NCI Clinical Studies Support Center at 1-888-NCI-1937. This call is toll-free and confidential. ◆

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growth factor receptor (EGFR), a protein on the surface of cancer cells that promotes tumor growth.

"Cetuximab has now been shown to benefit patients who have not responded to irinotecan-based chemotherapy. The FDA should be commended for moving decisively to get this drug to market," said NCI Director Dr. Andrew C. von Eschenbach.

According to an FDA news release, Erbitux was approved under the FDA's accelerated approval program, which allows the FDA to approve products for cancer and other serious or life-threatening diseases based on early evidence of a product's effectiveness.

In a 329-patient phase II clinical trial for metastatic colorectal cancer presented last June at the American Society of Clinical Oncology meeting, the combination therapy shrank tumors in 22.9 percent of patients who had not responded to chemotheraphy, while cetuximab alone shrank tumors in 10.8 percent of patients. Tumor progression occurred at a median of 4.1 months in the combination therapy group, compared to 1.5 months in the group receiving cetuximab alone. The trial found a statistically insignificant increase in survival time, and severe side effects were more frequent among patients receiving the combination therapy.

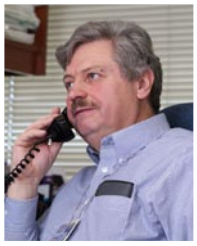
The NCI Cancer Therapy Evaluation Program is currently sponsoring a series of trials to assess cetuximab's effectiveness for other indications, including a phase III trial for patients with newly diagnosed metastatic colorectal cancer and several early trials combining cetuximab with other investigational agents.

The FDA also is currently reviewing the potential use of the monoclonal antibody bevacizumab (Avastin®) as a first-line treatment in patients with advanced colorectal cancer. ◆

Notes

Bouville Honored by National Academies

Dr. Andre Bouville, of NCI's Radiation Epidemiology Branch (REB), has been designated a National Associate by the National Academies. This lifetime honor is given in recognition of extraordinary service to the National Academies, which serve as advisor to the nation in matters of science, engineering, and medicine. Over the past 10 years, Dr. Bouville has made significant contributions to the National Research Council in evaluating the health effects from radioactive fallout. Dr. Bouville also received the Presidential Rank Award, a prestigious honor given to senior career government employees with a sustained record of professional and/or scientific achievement that is recognized on a national and international level.



New Online: *Cancer Progress Report–2003 Update*

Cancer Progress Report–2003 Update is the second in a series of reports describing the nation's progress against cancer. Structured in an easy-to-use format and written in plain language, the report can be used by the public to better understand the nature and results of strategies to fight cancer. Researchers, clinicians, and public health providers can focus on the opportunities and gaps identified, paving the way toward future progress; and policymakers can use the report to evaluate progress relative to our investment in cancer research discovery, program development, and service delivery.

Included are key measures of progress along the cancer continuum in the areas of prevention, early detection, diagnosis, treatment, life after cancer, and end of life. Where possible, the report shows changes in data over time, and most of the measures are identical to cancer-related targets in *Healthy People 2010*, a national health promotion and disease prevention initiative of the Department of Health and Human Services and its partners. Interactive features include three formats of dynamically generated graphs and links to their data files. The graphs can be saved for use in reports and presentations. The report is based on the most recent data from NCI, the Centers for Disease Control and Prevention, other federal agencies, the American Cancer Society, professional groups, and cancer researchers. The report is available online at http://progressreport.cancer.gov.

Funding Opportunities in Symptom Management and Palliative Care

NCI Program Directors Dr. Ann O'Mara and Dr. Mike Stefanek will present information on funding opportunities for symptom management and palliative care research at the upcoming conference, Mechanisms and Treatment of Cancer-Related Symptoms, at The University of Texas M. D. Anderson Cancer Center in Houston, Feb. 20-22.

Symptom management and palliative care research encompass the primary and tertiary prevention of both prevention- and treatment-associated morbidities. This includes research on the management of acute symptoms related to cancer and its active treatment from diagnosis through the end of life and is critical for NCI's challenge goal of eliminating the suffering and death due to cancer.

In addition, Dr. O'Mara will give a presentation on similar funding opportunities for the pediatric population at the Children's Oncology Group's Pediatric Oncology Nursing State of the Science II meeting in Washington, D.C. on Feb. 27. Dr. O'Mara can be reached at omaraa@mail.nih.gov for more information.

Taxol® Study Samples Available for Microarray Analysis

The NCI Cancer Diagnosis Program (CDP), through a partnership with a national clinical cooperative group, is offering a new tissue microarray resource to scientists interested in evaluating candidate predictive markers of Taxol® response and resistance in patients with breast cancer.

The tissue microarray set contains specimens from all 2,000 cases enrolled in a clinical trial that assessed the benefit of including Taxol® with the standard doxorubicin-cyclophosphamide regimen in the treatment of axillary lymph node-positive breast cancer. The randomized trial, called B-28, was conducted by the National Adjuvant Surgical Breast and Bowel Project (NASBP). The NASBP is one of nine clinical cooperative groups funded by NCI to organize and direct large clinical cancer treatment studies. Tissue microarrays consist of material obtained from biopsies or surgical procedures embedded in paraffin and give investigators a more accurate way to determine responses to the Taxol® drug regimen.

There is enough tissue in the microarrays to provide up to 50 researchers with the complete specimen set from the trial along with clinical and outcome data. Investigators with specific, sensitive, and reproducible assays for candidate biomarkers should submit a request for the tissue microarrays to CDP by June 1, 2004. NCI also has tissue microarray specimens available for evaluation of diagnostic markers for prostate cancer, along with those for breast cancer. Additional sets will be available soon for research on bladder, ovarian, and colorectal cancers. ◆

Featured Meetings

This is a list of selected scientific meetings sponsored by NCI and other organizations. For locations and times and a more complete list of scientific meetings, including NCI's weekly seminars and presentations open to the public, see the NCI Calendar of Scientific Meetings at http://calendar.cancer.gov.

2004 NCI Advisory Committee Upcoming Meetings February-March

Date	Advisory Committee
Feb 18-19	National Cancer Advisory Board
Mar 15-16	Clinical Sciences and Epidemiology—Subcommittee 1, Board of Scientific Counselors, NCI
Mar 15-16	Basic Sciences—Subcommittee 2, Board of Scientific Counselors, NCI
Mar 15-16	NCI Board of Scientific Advisors

Selected Upcoming Meetings of Interest

Date	Meeting	NCI Speaker
Feb 23-26	International Conference on Drug Development	Dr. Andrew C. von Eschenbach, Director
Feb 25-26	Central Florida Health Care Coalition's 11th Annual National Conference	Dr. Ellen Feigal, Acting Director, Division of Cancer Treatment and Diagnosis
Feb 26-28	The Last Miles of the Way Home: National Conference to Improve End-of-Life Care for African Americans	Dr. Harold P. Freeman, Director, Center to Reduce Cancer Health Disparities
Feb 27-Mar 3	25th High Country Nuclear Medicine Conference	Dr. Ellen Feigal, Acting Director, Division of Cancer Treatment and Diagnosis
Mar 1-3	45th Annual Clinical Conference—Multidisciplinary Care: The Present and Future	Dr. Andrew C. von Eschenbach, Director
Mar 3	Cancer Nanotechnology Symposium—Nanotechnology: Visualizing and Targeting Cancer	Dr. Anna Barker, Deputy Director, Strategic Scientific Initiatives
Mar 4	Cancer Nanotechnology Symposium—Nanotechnology: Enabling Breakthroughs in Cancer Early Detection and Therapeutics	Dr. Anna Barker, Deputy Director, Strategic Scientific Initiatives

NCI Exhibits

NCI Exhibits are presented at various professional and society meetings. Further information about the NCI Exhibits Program can be found at http://exhibits.cancer.gov.

This *NCI Cancer Bulletin* is produced by the National Cancer Institute (NCI). NCI, which was established in 1937, leads a national effort to eliminate the suffering and death due to cancer. Through basic and clinical biomedical research and training, NCI conducts and supports research that will lead to a future in which we can 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://cancer.gov.

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