NATIONAL CANCER INSTITUTE

NCI Cancer Bulletin

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FDA To Establish New Cancer Office

The Food and Drug Administration (FDA) announced on July 16 that it will create the Office of Oncology Drug Products (ODP) to help foster a strong and consistent approach to the review process for drugs and most therapeutic biologics used to diagnose, treat, and prevent cancer.

"Biomedical research in the United States is second to none, and it is our responsibility to see that patients reap the fruits of that research," said Health and Human Services Secretary Tommy G. Thompson. "We are committed to creating the most effective and efficient review process possible to ensure life-saving treatments are made available to cancer patients."

"This initiative by FDA will benefit cancer patients in the future by helping new cancer drugs reach the community," said National Cancer Institute Director Dr. Andrew C. von Eschenbach. "As NCI promotes research to develop new interventions to prevent, detect, and treat cancer, we look forward to supporting FDA's efforts.

"We have been working with FDA and other agencies and organizations to bridge the gap between the promise of research and its application to people

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Director's Update

The Tumor Microenvironment: Providing Important Clues to Metastasis

Cancers become most deadly when they metastasize, yet finding ways to combat metastasis has been a significant Achilles heel of cancer research. But our growing understanding of the role that a tumor's "microenvironment" plays in metastasis may allow us to shift the tide.

Drs. Dinah Singer and Suresh Mohla

We now know that the tumor microenvironment is an important component of tumor initiation, progression, and metastasis, and as a result, may play prominently in the development of new therapeutic approaches to combating cancer. The tumor microenvironment, or stroma, not only contributes to some of the destructive characteristics of malignant cells, but it also can undermine treatment by partially shielding tumors from therapeutics, altering drug metabolism, and contributing to drug resistance. Because stromal elements figure in all stages of tumor development, they represent attractive therapeutic targets. Manipulating host-tumor interactions, for example, may help prevent cells from becoming malignant or even encourage malignant

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with cancer," Dr. von Eschenbach continued. "It is critically important that we seamlessly integrate discovery and development of new drugs with the approval process so we can deliver these vital therapies to the American people."

This announcement follows other changes to the FDA cancer review processes, including formation of the FDA/NCI Interagency Oncology Task Force to enhance the efficiency of clinical research and scientific evaluation of new cancer medications. Announced in May 2003, this joint agreement allows FDA and NCI researchers to share knowledge and resources to optimize the development and delivery of new cancer drugs to patients.

In addition to improving consistency of review and policy for oncology drugs, ODP will bring together a critical mass of oncologists to help in development of new therapies and provide technical consultation between FDA's Center for Drug Evaluation and Research (CDER) and other FDA components. ODP also will be responsible for reviewing drugs and certain therapeutic biologicals used in medical imaging to detect, treat, or monitor cancer.

To support this new oncology office and coordinate cancer prevention, diagnosis, and treatment work performed throughout its centers, FDA is also creating a cross-cutting oncology program to be housed within ODP. This oncology program will facilitate cross-agency expert consultation, provide a forum to discuss and develop regulatory policy and standards, and serve as a focal point for agency interaction and collaboration with oncology professional societies, NCI, and other stakeholders. This program will also coordinate cross-cutting training and oncology educational activities.

A national search to recruit a director for this office will begin later this summer. Final implementation of this new structure will occur when new CDER drug review staff move to a new FDA facility in April 2005. ◆

(Director's Update continued from page 1)
cells to revert to their normal state.

Despite the importance of interactions between the tumor and stroma, we have a limited understanding of the components that compose the stroma and the stroma and tumor's complex relationship. We know generally that tumor stroma consists of cells (such as fibroblasts, epithelial cells, and inflammatory cells), extracellular matrix, and extracellular molecules. We do not know, however, the precise nature of the cells that compose normal stroma, how these cells or newly recruited cells are altered during tumor progression, and how they influence tumor initiation and progression.

By addressing these questions, we can begin to develop therapeutic strategies that target both the microenvironment and the tumor. This will likely include the development of drugs that induce apoptosis, inhibit stromal cell function, or inhibit the factors secreted by stromal cells that are required for tumor progression and metastasis. As our understanding of the tumor microenvironment grows, we also believe it will lead to the development of new diagnostic and prognostic tests. Finally, it may be possible to develop strategies to prevent the development of tumors based on our understanding of the microenvironment changes required for tumor development.

NCI is committed to promoting research aimed at better understanding the tumor microenvironment and its interaction with the tumor, and identifying and characterizing the molecular "signatures" of seemingly normal cells within the tumor microenvironment as well as signatures that reflect changes that occur as cancer cells interact with the host microenvironment.

The formation of interdisciplinary research teams and multi-institutional collaborations is critical to expediting our achievement of this goal, and NCI is beginning to explore how best to facilitate these activities. Similarly, the development of enabling technologies will be critical to advances in this field. A number of technologies have been identified as critical to this effort, including novel *in vitro* 3-D organotypic models and animal models; techniques for the isolation and characterization of stromal cells, such as laser capture microscopy; and the development of reagents that can be used in *in vivo* imaging to visualize tumor-host interactions based on stromal markers identified through molecular profiling.

The combination of collaboration and enabling technologies has set the stage for significant advances in this area, especially the development of tissue- or cell-specific targeting agents. During the coming year, we will actively pursue approaches to respond effectively to both of these needs. In the end, we would like to make the microenvironment around tumors a hostile host, disrupting or averting metastasis. At its most effective, this approach, in combination with other therapies, may very well help to transform cancer into a chronic but benign disease—one with which patients can lead long and productive lives. ◆

Dr. Dinah Singer
Director, Division of Cancer Biology

Dr. Suresh Mohla
Chief, Tumor Biology and Metastasis Branch

Special Report

Prostate, Colorectal Screening Rates Affected by Numerous Factors

It's been more than 4 years since *Today Show* co-host Katie Couric attempted to stamp the importance of colorectal cancer screening onto the national psyche by undergoing a colonoscopy live on the air. In the weeks and months that followed, colon cancer screenings increased dramatically, at least according to one study of the "Katie Couric Effect" published in the *Archives of Internal Medicine*.

Four years later, although screening rates in people 50 and over (the recommended age for screening) have shown measured improvement, there still is a significant shortfall in the number of men and women who should be screened but haven't been. That trend comes in perplexing contrast to prostate-specific antigen (PSA) screening for prostate cancer, which has seen substantial growth despite a lack of evidence from controlled clinical trials that screening saves lives and concerns about adverse consequences of treatment for a disease that may never have manifested in the absence of screening, nor become life-threatening. Last week at the fourth annual Translating Research into Practice conference in Washington, D.C., experts came together to discuss why there is this curious contradiction of PSA and colorectal cancer screening practices in the United States.

In a study published in the March 2003 *Journal of the American Medical Association*, for example, researchers from the VA Outcomes Group in Vermont assessed the results of a 2001 Centers for Disease Control and Prevention survey and found that 75 percent of men 50 and over reported having had a PSA test, while only 63 percent reported having ever been screened for colorectal cancer by any of the five available modalities. Up-to-date prostate cancer screening was also higher than for colorectal cancer screening, including men over 80 years old, for whom screening is considered to be of little if any benefit. Meanwhile, Dr. Michael Barry of Massachusetts General Hospital presented a recent unpublished survey that found that 95 percent of urologists and 87 percent of general and family practitioners supported PSA testing for asymptomatic men, and 95 percent of urologists and 78 percent of general and family practitioners had a PSA test themselves.

These results reinforce another important point, says Dr. Jon Kerner, deputy director for Research Dissemination and Diffusion in the NCI Division of Cancer Control and Population Sciences: What practitioners do for themselves often indicates what they'll recommend to their patients. "It's understandable that practitioners who practice a behavior themselves are more likely to believe in it and will translate that practice into their recommendations to patients," Dr. Kerner says.

A communication gap between physicians and patients may explain part of the problem, said Dr. Michael Pignone, of the University of North Carolina. For example, in a 2002 survey of nearly 1,100 people conducted by the Cancer Research Foundation of America, only 52 percent of respondents 50 or older reported having been advised by their physicians to get an endoscopic exam for colorectal cancer screening. Other factors such as a lack of an appropriate information system infrastructure and inadequate access to care may also play a role.

Patients' role in this phenomenon—including their fear of the more invasive colorectal cancer screening modalities—cannot be discounted, argued Dr. Steven Woolf, of Virginia Commonwealth University. The male patients he sees typically do not hesitate to agree to PSA screening, a simple blood test. But it's often a different story with colorectal cancer screening. "I emphasize that all national guidelines recommend screening starting at 50 and that they can choose which tests they prefer," Dr. Woolf recounted. "And they say, 'I'll think about it.' I think that reflects where patients are right now."

The contrast between patient uptake of prostate and colorectal cancer screening, Dr. Kerner explains, also highlights the importance of implementing a better "wholesale approach" to educating health care providers and patients. The CEO Cancer Gold Standard initiative recently launched by C-Change (see June 1 *NCI Cancer Bulletin*), in which leaders from some of the nation's largest corporations pledged to add cancer screening and prevention measures to their employees' health benefits, is a good example. "When you get companies to adopt those types of benefits, that's a 'wholesale' approach, because it addresses system barriers to appropriate screening and creates a supportive environment to get it done," Dr. Kerner says. "We need to better understand how to affect these wholesale systems to complement what we're trying to accomplish at the individual ('retail') patient level." ◆

Cancer Research Highlights

Combined Radiation and Vaccine Therapy Can Halt Tumor Proliferation

NCI researchers have shown that sub-lethal doses of radiation administered in combination with tumor-specific vaccines can reduce tumor size and stimulate immune system-related cells. In the June 15 *Cancer Research*, a team of NCI scientists led by Drs. Mala Chakraborty and James Hodge demonstrated that exposure to low amounts of radiation, either by single or multiple doses, can augment the effects of a tumor-specific vaccine regimen.

Recent research has shown that sub-lethal amounts of radiation can be used to stimulate host immune system cells without causing serious tissue damage. Vaccine therapy, currently only in experimental stages, also focuses on generating a greater host immune response to cancer.

Using mouse models to assess several endpoints, including the expression of proteins in tumors and the rise of T cells within the tumor site, scientists reported that at 8 days following tumor transplant, mice that received vaccine or radiation therapy alone did not have significant tumor reduction. Mice that received combination vaccine and radiation treatment demonstrated a marked decline in tumor growth as well as volume. When single-dose radiation therapy was compared with fractionated dose radiation therapy (both in conjunction with the vaccine), approximately 50 percent of the mice were cured of tumor. This combination therapy "may induce far more effective anti-tumor responses than those seen using either modality alone," the authors noted.

Smoking Affects Genes in Bronchial Cells

Researchers have detected 97 genes in bronchial airway cells that alter their expression levels when exposed to cigarette smoke. They discovered that while most of these altered genes revert back to normal expression 2 years after an individual stops smoking, some genes remain at altered levels even 30 years after smoking cessation. These findings, reported in the July 6 *Proceedings of the National Academy of Sciences*, may explain why former smokers' risk of cancer remains high many years after quitting.

The team of the Boston University School of Medicine and College of Engineering, led by Dr. Avrum Spira, uncovered these genes by using high-density microarrays to compare gene expression among 34 current smokers, 18 past smokers, and 23 never smokers. The majority of these 97 genes encode proteins involved in stress response; the cell raises or lowers the expression of these genes to help protect itself against the toxic effects of cigarette smoke. Not surprisingly, several potential tumor suppressor genes and oncogenes also show altered expression in smokers.

There was a small subset of three current smokers with a different expression profile; many of their stress genes did not alter expression when exposed to cigarette smoke. Since they showed a deficient stress response, these smokers potentially have an increased risk of smoking-related damage. This finding might indicate that some people have a predisposition to cancer and other ill-effects of smoking.

Dairy and Colorectal Cancer

Dairy consumption may be inversely associated with development of colorectal cancer. A study in the July 7 *Journal of the National Cancer Institute* reported that both milk and calcium intake could reduce the risk of colorectal cancer, while other dairy products such as yogurt and cheese were not found to have a significant association. Researchers in North America and Europe participated in this study, which was led by Dr. Eunyoung Cho of Harvard Medical School. Ten cohort studies were pooled for analysis having a total of 534,536 subjects and a follow-up range between 6 and 16 years.

Colorectal cancer is considered a highly treatable condition and is cured in about 45 percent of patients who undergo treatment. Surgery is the primary therapy for the disease. Lowering cancer risk reduces undue pain and suffering and decreases health care costs associated with surgery and other treatments.

In this study, milk was found to be the only dairy product of statistical significance to lower colorectal cancer risk. The relationship between milk and colorectal cancer was highly consistent across the 10 studies. The authors also studied calcium intake and found it to have an inverse association with colorectal cancer as well, but with a threshold effect observed within the data; little further benefit was seen in risk reduction for colorectal cancer when individuals ingested more than 1,000 milligrams of calcium per day.

Endothelial Cells May Provide Insight into Angiogenesis

The cells lining B-cell lymphoma blood vessels take on genetic characteristics of the tumors themselves, according

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to a study published in the July 15 *New England Journal of Medicine*. Dr. Berthold Streubel and colleagues at the Medical University of Vienna show that although these cells were commonly believed to be genetically stable and normal, the reality is much more complicated.

In order to secure an oxygen supply, tumor cells must induce nearby blood vessels to grow—a process called angiogenesis. The researchers studied tissue from 27 B-cell lymphomas with known chromosomal abnormalities. In all the lymphomas examined, varying proportions of blood vessel cells shared the tumor cells' chromosomal aberrations.

Researchers conclude there is a genetic relationship between these cells, the nature of which remains unclear. They propose several possible explanations: 1) the tumor and endothelial cells may share a common precursor, 2) some endothelial cells may share the lymphoma's genetic abnormalities because they arise from a cell already committed to a lymphoid lineage, 3) these endothelial cells could be the result of cell fusion, or 4) they may become polyploid by engulfing apoptotic bodies from tumor cells.

In an accompanying commentary, Drs. Isaiah Fidler and Lee Ellis of the University of Texas M.D. Anderson Cancer Center in Houston assert that "the important message from this insightful study is that tumor microvasculature is much more complex and unpredictable than it was initially perceived to be." Uncovering and recognizing these complexities will help researchers develop better anti-angiogenesis treatments.

Improving Detection for Ovarian Cancer

Drs. Thomas Conrads and Tim Veenstra of the Laboratory of Proteomics and Analytical Technologies at NCI-Frederick (operated by SAIC-Frederick, Inc.) in collaboration with NCI researchers published a study in the June 2 issue of *Endocrine-Related Cancer* discussing how mass spectrometry (MS) combined with new technology might improve detection for ovarian cancer. Other research hypothesized that MS could be used as a tool in the detection of breast, ovarian, and prostate cancers; however, instead of attempting to identify a single biomarker, researchers instead used patterns of mass spectral features comprising peptide or other ions as the diagnostic tool itself in determining whether high- or low-resolution spectra have more sensitivity and/or specificity.

In the past, ovarian cancer detection has relied upon the elevation of cancer antigen 125 (CA 125), the ovarian cancer biomarker detected by the monoclonal antibody OC 125. Although levels of CA 125 are reportedly higher in 80 percent of patients with advanced ovarian cancer, elevated levels are detected in only approximately 50 to 60 percent of women with stage one disease.

Researchers analyzed 248 patient serum samples obtained from the National Ovarian Cancer Early Detection Program and the gynecologic oncology clinic at Northwestern University. These samples were examined using both high- and low-resolution mass spectrometers. The group of sera analyzed was divided into three data sets to determine the sensitivity and specificity of the samples. For all sets, both sensitivity and specificity results were higher for the high-resolution MS than for low-resolution MS. Single biomarkers lack sensitivity and specificity when applied to large, heterogeneous populations; the new technology of biomarker pattern analysis may help overcome this limitation to improve patient survival rates and treatment options. ◆

Funding Opportunities

Transdisciplinary Research on Energetics and Cancer

RFA-CA-05-010
Letter of Intent Receipt Date: Oct. 15, 2004
Application Receipt Date: Nov. 16, 2004

NCI invites center grant applications to establish the Transdisciplinary Research on Energetics and Cancer (TREC) Centers in nutrition, energetics, energy balance, and physical activity. These Centers will involve scientists from multiple disciplines and will encompass projects spanning the biology and genetics of behavioral, sociocultural, and environmental influences on nutrition, physical activity, weight, energy balance, and energetics.

The RFA will use the U54 NIH cooperative agreement award mechanism.

For more information see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=2165. Inquiries: Dr. Linda Nebeling, nebelinl@mail.nih.gov

TREC Coordination Center

RFA-CA-05-011
Letter of Intent Receipt Date: Oct. 15, 2004
Application Receipt Date: Nov. 16, 2004

The Division of Cancer Control and Population Sciences, NCI, invites applications for cooperative agreements to support the establishment of a Transdisciplinary Research on Energetics and Cancer (TREC) Coordination Center. This Coordination Center will support the TREC Centers, which focus upon the research areas of nutrition, energetics, energy balance, and physical activity. The primary missions of the Coordination Center is to foster collaborations among transdisciplinary teams of
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scientists, to facilitate data analyses, to examine common research questions across sites, to coordinate and facilitate semi-annual meetings of the TREC Centers, to develop training modules, and to evaluate progress.

The RFA will use the U01 NIH cooperative agreement award mechanism.

For more information see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=2164. Inquiries: Dr. Linda Nebeling, nebelinl@mail.nih.gov

NCI will hold a pre-application phone conference to which all prospective applicants for RFA-CA-05-010 and RFA-CA-05-011 are invited. For more information, go to http://www.scgcorp.com/trec-call2004.

Supplements To Promote Reentry Into Biomedical and Behavioral Research Careers

PA-04-126
Application Receipt Dates: Jul. 8, 2005; Jul. 8, 2006; Jul. 8, 2007

The participating institutes and centers of the NIH along with the Office of Research on Women's Health announces a continuing program for administrative supplements to research grants to support individuals with high potential to reenter an active research career after taking time off to care for children or attend to other family responsibilities. It is anticipated that at the completion of the supplement, the reentry scientist will be in a position to apply for a career development (K) award, a research award, or some other form of independent research support.

The following active NIH award mechanisms at domestic institutions are eligible: R01, R10, R18, R24, R35, R37, P01, P40, P41, P50, P51, U54, P60, U01, and U10.

For more information see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=2161. Inquiries: Bobby Rosenfeld, roberta.rosenfeld@nih.hhs.gov ◆

Featured Clinical Trial

Immunotherapy for Non-Responsive Solid Tumors

Name of the Trial
Phase I Study of Interleukin-7 in Patients with Refractory Solid Tumors (NCI-03-C-0152). See the protocol summary at http://cancer.gov/clinicaltrials/NCI-03-C-0152.

Principal Investigator
Dr. Claude Kasten-Sportes, NCI Center for Cancer Research

Dr. Claude Kasten-Sportes
Principal Investigator

Why Is This Trial Important?
Immunotherapy involves stimulating or restoring the body's immune system to more aggressively fight disease and is one method being investigated to treat many different forms of cancer.

Interleukin-7 (IL-7) is one immunotherapy agent being tested to treat cancer. IL-7 can stimulate tumor-fighting white blood cells (T cells and B cells) to grow. In addition, some animal studies have shown that treatment with IL-7 may cause tumors to shrink.

In this phase I trial, researchers are testing IL-7's ability to stimulate patients' white blood cells to kill cancer cells in solid tumors that have not responded to standard therapies. Solid tumors include cancers of body tissues other than the blood, bone marrow, or lymphatic system.

"IL-7 seems to be a very promising immunotherapy agent," said Dr. Kasten-Sportes. "This trial should provide the knowledge of how to best use IL-7 to improve immunotherapy in the treatment of solid tumors."

Who Can Join This Trial?
Researchers seek to enroll 15-30 patients aged 18 or over with diagnosed solid tumors for which there is no known curative therapy and that have not responded to standard therapy. See the full list of eligibility criteria for this trial at http://cancer.gov/clinicaltrials/NCI-03-C-0152.

Where Is This Trial Taking Place?
This study is taking place at the National Institutes of Health Warren G. Magnuson Clinical Center in Bethesda, Md.

Who to Contact
For more information, call the NCI Clinical Studies Support Center (CSSC) at 1-888-NCI-1937. The CSSC provides information about cancer trials taking place on the NIH campus in Bethesda, Md. The call is toll free and confidential. ◆

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

Notes

Dr. von Eschenbach Presents Grand Rounds Lecture

NCI Director Dr. Andrew C. von Eschenbach spoke at NCI's Center for Clinical Research (CCR) Grand Rounds on July 13, discussing NCI's goal of eliminating suffering and death due to cancer by 2015. Dr. von Eschenbach illustrated how NCI, in the 30 years since the signing of the National Cancer Act, has created and nurtured the largest cancer enterprise worldwide. NCI's future, Dr. von Eschenbach stated, is in supporting the discovery, development, and delivery continuum to individualize patient treatment, decrease health care costs, and provide the most state-of-the-art technology available to control cancer. He invited the incoming fellows to become a part of NCI history by challenging them to push the limits of cancer research, and to make a difference for generations of researchers to come.

Defeating Cancer through Prevention and Early Detection

On July 13, Friends of Cancer Research, the Senate Cancer Coalition, and the House Cancer Caucus hosted a panel discussion on defeating cancer through chemoprevention and early detection. Dr. Anna Barker, NCI deputy director for advanced technologies and strategic partnerships, joined panel members Clifton Leaf, executive editor, *Fortune*; Dr. Rick Pazdur, director, FDA's Oncology Drug Products Division; Dr. Homer Pearce, distinguished research fellow, Eli Lilly and Company; and Dr. Michael B. Sporn, professor of pharmacology, Dartmouth Medical School. Carolyn "Bo" Alidge, president, Cancer Research and Prevention Foundation, gave introductory remarks, and Representative Sue Myrick (R-N.C.) shared her personal experience with cancer. Susan Dentzer, health correspondent, *NewsHour with Jim Lehrer*, moderated the panel. The panel agreed on the broad changes needed to achieve the aforementioned goal: a societal commitment to prevention as distinct from cancer treatment; public education on the nature of cancer as a chronic, progressive disease; incentives for industry that would encourage a focus on prevention; and improvements to the regulatory approval process for chemoprevention agents.

Each panel member suggested one step needed to reach the goal of defeating cancer; Dr. Barker highlighted the importance of connecting people through the real-time transfer of information.

Vonderhaar Presents Cserr Lecture

On July 7, Dr. Barbara K. Vonderhaar, chief of NCI's Mammary Biology and Tumorigenesis Laboratory in the Center for Cancer Research, presented the Helen F. Cserr Memorial Lecture at Mount Desert Island Biological Laboratory (MDIBL). Dr. Vonderhaar's talk was entitled "Prolactin: The Forgotten Hormone of Breast Cancer."

Dr. Vonderhaar is also chair of NCI's breast cancer faculty and co-chair of the Intramural Program for Research on Women's Health at the National Institutes of Health (NIH). She received her Ph.D. in oncology from the University of Wisconsin-Madison. After postdoctoral training in mammary gland biology at NIH, she joined NCI where she studies prolactin action in breast cancer. Dr. Vonderhaar was the first to purify a prolactin receptor from any source and the first to characterize a monoclonal antibody directed against the human prolactin receptor.

Mouse Model Consortium Committee Meets to Set Priorities

NCI's Mouse Models of Human Cancers Consortium (MMHCC) held its semiannual steering committee meeting July 14-16 in Washington, D.C. This committee provides continuing advice to NCI on the needs and priorities for mouse models and the necessary infrastructure, resources, and technologies to support their development and deployment to the research community. Meeting participants included MMHCC principal investigators (PIs) and co-PIs, staff from NCI's extramural divisions and caBIG, and Cheryl Marks, the MMHCC program director who lead efforts to plan this meeting. The goals of the meeting were to set the policies and procedures for the Consortium and decide the relative merit of proposed initiatives by the thematic, standing, and working group committees.

At the meeting's roundtable discussions, PIs summarized their research in the early origins of cancer, host and environmental factors, tumor progression and metastasis, and interventions. NCI staff presented information about NCI's caBIG and mouse repository.

MMHCC is an NCI collaborative program that derives and validates mouse models; generates resources, information, and innovative approaches to the application of these models in cancer research; provides the cancer research community with information about mouse models and research generated by the consortium and other NCI-supported projects through electronic venues including the EMICE and mouse repository Web sites, online databases, and a monthly newsletter. For more information, go to http://emice.nci.nih.gov/. ◆

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.

NCI Advisory Committee Upcoming Meetings

Date	Advisory Committee
July 27	Advisory Committee to the Director, NCI

Selected Upcoming Meetings of Interest

Date	Meeting	NCI Speakers
July 21-23	Minority Investigator Career Development Workshop	Dr. Mark Clanton, Deputy Director, Cancer Care Delivery Systems
July 23-25	Genetic Alliance Conference 2004—Joining our Journeys: One Step at a Time	Dr. Harold P. Freeman, Director, Center to Reduce Cancer Health Disparities
July 25-27	19th Aspen Cancer Conference	Dr. J. Carl Barrett, Director, Center for Cancer Research
July 26-27	Cancer Survivorship: Improving Care and Quality of Life	Dr. Karen Antman, Deputy Director, Translational and Clinical Sciences; Dr. Noreen M. Aziz, Program Director, Office of Cancer Survivorship, Division of Cancer Control and Population Sciences
July 28-29	Research Strategies, Study Designs and Statistical Approaches to Biomarkers Validation for Cancer Diagnosis and Detection	Dr. Peter Greenwald, Director, Division of Cancer Prevention; Dr. Anna Barker, Deputy Director, Advanced Technologies and Strategic Partnerships; Dr. Sudhir Srivastava, Chief, Cancer Biomarkers Research Group, Division of Cancer Prevention; Dr. Richard Simon, Chief, Biometric Research Branch, Division of Cancer Treatment and Diagnosis; Dr. Stuart G. Baker, Biometry Research Group, Division of Cancer Prevention

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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