NATIONAL CANCER INSTITUTE

NCI Cancer Bulletin

Eliminating the Suffering and Death Due to Cancer

February 28, 2006
Volume 3 | Number 9

In this issue:

A Publication of the
National Cancer Institute
U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
National Institutes of Health
NIH Publication No. 05-5498

http://www.cancer.gov

New Trastuzumab Regimen Lessens Cardiac Side Effects

A Finnish study on therapies for early breast cancer reports lower cardiac side effects among women who received a shorter than standard course of treatment with trastuzumab (Herceptin), according to a study published in the February 23 *New England Journal of Medicine (NEJM)*.

To date, trastuzumab has been associated with heart failure among 1.7 to 4.1 percent of women taking the drug, and 10 percent of patients taking the drug have experienced substantial decreases in heart function.

The Finland Herceptin study administered trastuzumab to 116 women with HER2-positive tumors "before other cardiotoxic therapies and concomitantly with potentially synergistic chemotherapy for only 9 weeks to test the hypothesis that such a schedule would limit cardiotoxicity and maintain efficacy." This is different from previously published adjuvant studies in which anthracycline was given prior to trastuzumab. The patients were compared against a control group of 116 HER2-positive patients who received chemotherapy alone for 9 weeks without the addition of trastuzumab.

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Director's Update

Guest Update by Dr. John E. Niederhuber

Angiogenesis Initiative Fueling Collaboration

One of the most exciting new frontiers in cancer research is the increased focus on the tumor microenvironment. A major focus of this work is on the role of angiogenesis, the formation of new blood vessels to provide nutrients and oxygen to sustain the earliest development of a primary cancer or a metastasis. It was approximately 25 years ago that Dr. Judah Folkman first theorized in the pages of the *NEJM* that tumors needed to grow new blood vessels to fuel their development. Just 2 years ago, bevacizumab (Avastin) became the first agent specifically developed as an angiogenesis inhibitor to be approved by the Food and Drug Administration (FDA) for use in cancer patients to treat metastatic colorectal cancer.

Other FDA-approved anticancer agents—including bortezomib (Velcade) for the treatment of multiple myeloma and sunitinib (Sutent), which was approved just last month for the treatment of gastrointestinal stromal tumors—also have demonstrated the ability to inhibit angiogenesis. In addition, a number of new angiogenesis inhibitors are in development, including several in late-stage clinical trials, and researchers are finding *(continued on page 2)*

(Trastuzumab Regimen continued from page 1)
The trastuzumab group had better 3-year recurrence-free survival (89 versus 78 percent for the control group), the researchers report. None of the women who were treated with trastuzumab at the same time as the other chemotherapy had cardiac failure and, unexpectedly, these women had fewer decreases in heart function than the control group, they added.

"Our results indicate that a 9-week period of trastuzumab administration is effective in women with HER2/neu-positive breast cancer," note the researchers, led by Dr. Heikki Joensuu of Helsinki University Central Hospital. "Regimens in which only a few cycles of trastuzumab are administered concurrently with chemotherapy reduce the number of patient visits and may be more cost effective than regimens that require administration over a period of 12 to 24 months. In addition, such regimens may result in few cardiac adverse effects."

The Finnish study also compared docetaxel against vinorelbine in 1,010 breast cancer patients, including a subgroup of 232 HER2 patients. Docetaxel was found to have better recurrence-free survival than vinorelbine (91 versus 86 percent); however, docetaxel had more adverse effects than vinorelbine.

In an *NEJM* editorial, Harvard Medical School Professor Dr. Kenneth R. Chien comments on the findings in the HER2 arms of the study. He notes, "A longstanding question is whether it is possible to delineate the biologic pathways that link trastuzumab to the onset of cardiotoxic effects, so as to reveal approaches to the design of drugs that would dissociate the beneficial effects from the adverse ones." Dr. Chien says the Finnish study indicates "that the risk of heart failure associated with trastuzumab was negated because cardiac stress signals had not been activated" by the shortened course of anthracycline chemotherapy.

The study demonstrates that trastuzumab "can be given in therapeutically active doses with negligible cardiac side effects," Chien continues. "But whether a similar result might hold in larger numbers of patients or in women with preexisting heart disease is now a pressing question."

Dr. Sandra M. Swain, senior principal investigator in NCI's Medical Oncology Branch, also stressed the need for the Finnish study's findings to be confirmed "in a randomized trial in which a larger number of HER2-positive patients are evaluated." Nonetheless, she added, "It's a very interesting, well-designed study, and it's exciting because of the potential to give a short course of trastuzumab therapy with improved efficacy over chemotherapy alone and without creating cardiotoxicity."

The Finnish researchers acknowledged that the "small size of this subgroup and the short duration of the follow-up are limitations of the study." The optimal duration of adjuvant trastuzumab therapy is not known and may be clarified only in further randomized trials, the researchers add. ◆

By Bill Robinson

(Director's Update continued from page 1)

that some already approved chemotherapy drugs, when used more frequently at doses far lower than standard cytotoxic regimens, target the tumor vasculature.

A number of common disease conditions are, as Dr. Folkman put it, angiogenesis dependent, including macular degeneration, atherosclerosis, diabetic retinopathy, and many others. That recognition brought together representatives from five NIH institutes and the Juvenile Diabetes Research Foundation (JDRF) to launch the Trans-Institute Angiogenesis Research Program (TARP) in February 2004.

Just last week, its leaders, which include Dr. Steve Libutti of the Surgery Branch of the NCI Center for Cancer Research (CCR), provided a status report to the directors of all the National Institutes of Health (NIH) institutes and centers. The directors were excited about what they heard, and additional institute leaders indicated their desire to formally join TARP.

The TARP group sponsored a workshop in the spring of 2004 that led to a number of important recommendations, several of which have already been acted upon. In addition to a number of new, crossdisciplinary research collaborations among both extramural and intramural researchers, several new Requests for Applications have been released, including one sponsored by JDRF that has produced approximately 50 awards.

In addition, the NCI intramural program has committed space and resources to establish an angiogenesis core facility that will help validate and develop assays and reagents used in angiogenesis research, as well as develop new assays. A TARP Web site has been established to provide information about funding opportunities for vascular biology and angiogenesis-related research, resources for investigators, educational opportunities, and much more.

In 1990, 198 angiogenesis-related papers were published in peer-reviewed journals. Last year, more than 4,100 were published, and that number will only increase. TARP has the tremendous potential to

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Spotlight

Inhalers Tested in Lung Cancer Prevention Trial

The need to prevent lung cancer in a growing population of former smokers has led researchers to test inhalers as a means of delivering drugs directly to the lungs, a strategy that has proven to be safe and effective for treating chronic asthma.

By directing medication straight to the lungs, inhalers limit side effects in other parts of the body. The method also allows for lower doses than are needed when pills are used.

"Inhalation is the preferred route for doing chemoprevention in lung cancer at this time," says Dr. Stephen Lam, a senior scientist in the Department of Cancer Imaging at the BC Cancer Research Centre in Vancouver, British Columbia.

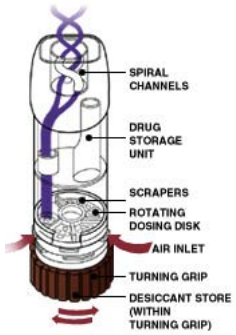
"Inhaled medication is easy to use, and there are fewer side effects when drugs are delivered directly into an organ rather than administered systemically," Dr. Lam adds.

Several years ago, Dr. Lam led a phase II lung cancer prevention clinical trial involving smokers who took inhaled budesonide for 6 months. The drug had no effect on the growth of bronchial lesions or the prevention of new lesions, the trial found.

Through the use of imaging tools known as spiral CT scans, however, the researchers observed that the drug may have affected small nodules in the peripheral lungs, some of which might have been precancerous growths.

Based on this observation, a new lung cancer prevention trial testing inhaled budesonide will begin soon in Italy. The phase II trial, led by the European Institute of Oncology, will be enrolling individuals who are already receiving annual spiral CTs as part of a larger lung cancer screening trial.

The researchers will focus on individuals who, after the second annual CT scan, have persistent lung nodules that appear not to be malignant but may be precursors to lung adenocarcinomas, according to Dr. Eva Szabo of NCI's Division of Cancer Prevention (DCP), which is sponsoring the trial.



A lung cancer prevention trial will test inhaled budesonide delivered by the Pulmicort Turbuhaler®.

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These individuals will be treated for 1 year with either budesonide or a placebo. The study will assess the efficacy of inhaled budesonide, and a larger trial will be planned if the results are positive. In addition, the researchers will focus on safety.

Safety is critical because the drug would be used by individuals who are at risk for cancer but who are also in apparent good health. "The challenge in making cancer prevention part of routine health care is to ensure long-term safety," says Dr. Szabo.

When people start taking a drug to prevent cancer, in all likelihood they will need to take it for an extended period of time. If the side effects diminish quality of life, or if there is an increase in other diseases due to the drug, the drug will not be taken.

An advantage of targeted delivery, then, is that healthy tissues are largely spared and the overall toxicity is reduced, much in the way that targeted cancer therapies attack mutant cells, sparing the others.

"Low toxicity is critical to getting chemoprevention to the public because, after all, real people have to take the drugs," says Dr. Szabo. "If a treatment to prevent cancer leads to another life-threatening condition, like heart disease, then you haven't made much progress."

Once a person stops smoking, the risk of lung cancer does not continue to increase, but neither does it go away. Cancer prevention for lung cancer attempts to intervene in the early and potentially treatable stages of a lengthy disease process.

The preclinical evidence that inhaled budesonide might be effective during the early stages of the process has come largely from research in mice, led by Dr. Vernon Steele of NCI's DCP.

Dr. Steele and his colleagues have shown that glucocorticoids, which include budesonide, were nearly 90 percent effective in preventing lung adenomas in mice. These results were the basis for the clinical trial led by Dr. Lam.

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Cancer Research Highlights

New Virus Found in Some Men with Prostate Cancer

Researchers from the Cleveland Clinic and the University of California, San Francisco have identified a new virus, named XMRV, which may be linked to the development of prostate cancer. The preliminary results from their work were presented at the 2006 Prostate Cancer Symposium, held February 24–26 in San Francisco.

The researchers used a DNA ViroChip, which holds the genetic sequences of approximately 1,000 viruses—all known viruses of humans, animals, and plants—to screen prostate tumor samples from 86 men who underwent surgical resection of their tumors. They compared infection with the XMRV virus between men with mutations in both copies of the gene *HPC1*, which encodes the virus-fighting protein RNaseL, with men with one or both normal copies of the gene. Previous research had shown that mutations in *HPC1* correlated with a higher risk of prostate cancer. In those studies, the presence of the virus also correlated strongly with mutations in *HPC1*: 45 percent of men with two mutated copies of *HPC1* harbored the XMRV virus, compared with 1.5 percent of men with one or no mutated copies of *HPC1*. The virus was found to be actively expressing proteins within the prostate cells, not lying dormant.

It is not yet known if the virus plays a role in the development of prostate cancer. In a press release accompanying their presentation, lead investigator Dr. Eric Klein explained that previous studies had suggested an infectious origin for some types of prostate cancer: "The hypothesis is that infection leads to chronic inflammation of the prostate, which ultimately leads to cancer." Dr. Klein and his collaborators are currently working on an experimental design to examine whether XMRV does play a causative role in prostate carcinogenesis.

Tobacco Use Among Young People Is Rising Worldwide

The Global Youth Tobacco Survey (GYTS) has found that tobacco use is on the rise among young people worldwide, in a report published online February 17 in the *Lancet*.

GYTS, developed by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO), surveyed approximately 750,000 students aged 13 to 15 years from 131 countries, the Gaza Strip, and the West Bank about tobacco use, the leading cause of several cancers and cardiovascular and respiratory diseases. Results showed that overall, nearly 9 percent of students were current smokers and 11 percent were current users of tobacco products other than cigarettes. The GYTS also found that more than 30 percent of students in every region of the world were exposed to secondhand smoke at home, while more than 45 percent were exposed to secondhand smoke in public places.

Dr. Charles Warren, of CDC's Office of Smoking and Health, commented that the GYTS findings suggest that the effect of tobacco use on worldwide deaths could be far greater than expected. He added that current warnings of a doubling of the death toll to 10 million deaths per year by 2020 could be a conservative estimate. A *Lancet* editorial stated that unless the WHO Framework Convention on Tobacco Control signatories fully commit to enhancing their tobacco control and prevention efforts, the myriad achievements of these initiatives will be lost.

According to another article in the same issue of *Lancet*, one of the largest developing countries facing this alarming trend is India, where increased tobacco use among young people in urban areas is expected to result in a substantial burden of disease and health care expenditures.

The recent NCI-funded study was conducted by the University of Minnesota School of Public Health and Project Mobilizing Youth for Tobacco-Related Initiatives in India. The researchers surveyed over 11,600 students in sixth and eighth grades in 32 schools in Delhi and Chennai. A key finding was that students in sixth grade were two to four times more likely to use tobacco than those in eighth grade, and that psychosocial risk factors for tobacco were also greater in the younger students. As the authors note, "These findings might indicate the initial wave of a large increase in tobacco use in India, which is alarming and warrants confirmation and early intervention in young students."

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(Highlights continued from page 4)

New NSAID Reverses Ovarian Cancer Cell Resistance to Cisplatin

A new study indicates that NCX-4016, a nonsteroidal anti-inflammatory drug (NSAID) derived from aspirin, has cytotoxic effects in ovarian cancer cells and can reverse acquired resistance to cisplatin. The results were published in the February 23 *Proceedings of the National Academy of Sciences*.

NCX-4016 is being studied for a number of indications, including colon cancer prevention.

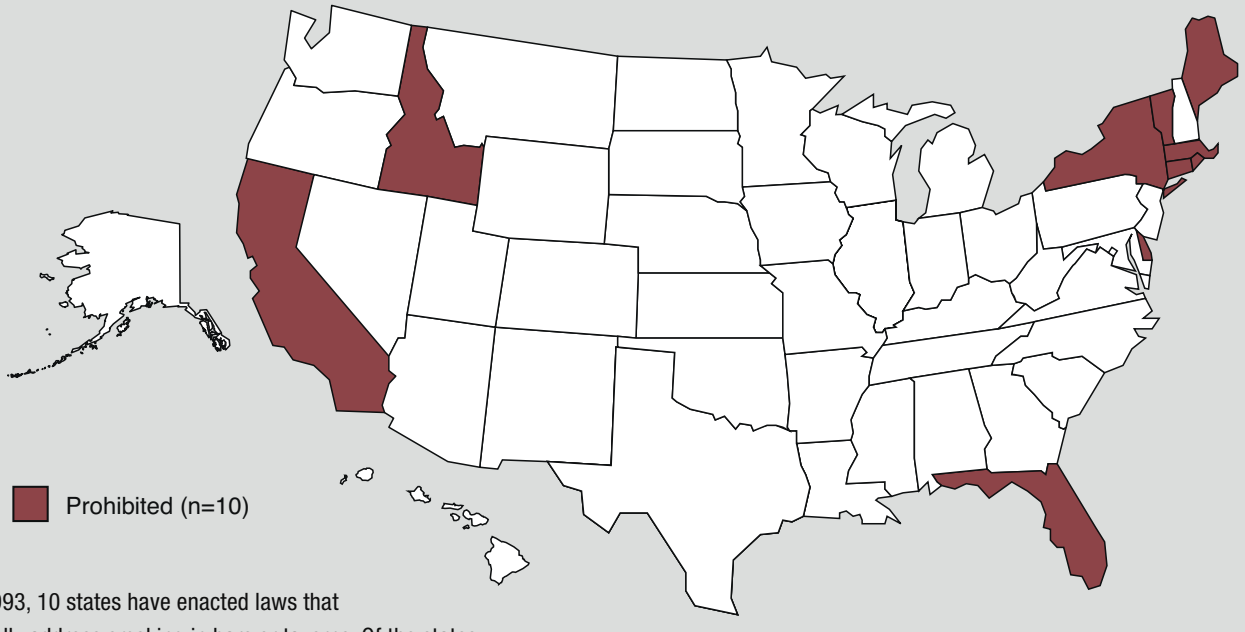
One proposed mechanism behind cisplatin resistance is an increase in the level of thiols—sulfur analogs of alcohols—within the cancer cells, which can inactivate platinum compounds. The release of nitrous oxide (NO) by compounds such as NCX-4016 is stimulated by high levels of cellular thiols. NO can then react with thiols in cytotoxic pathways. The investigators hypothesized that NCX-4016 not only would be toxic to ovarian cancer cells when administered alone, but also would decrease the thiol content in the cells through reactions with NO and resensitize the cells to cisplatin.

After identifying ovarian cancer cell lines as cisplatin sensitive (CS) or cisplatin resistant (CR), and confirming that NCX-4016 releases NO *in vitro*, the investigators exposed CS and CR cells to NCX-4016 and performed cell-survival assays. NCX-4016 alone caused cell death in both CS and CR lines; the magnitude of the effect depended on dose and exposure time.

When the investigators treated both CS and CR cell lines with cisplatin, the drug caused a significant reduction in colony formation in CS cells but not CR cells, as expected. Treatment with NCX-4016 before exposure to cisplatin caused significantly greater cell death in both CS and CR cells than treatment with cisplatin or NCX-4016 alone. Examination of the thiol content of CS and CR cells revealed that CR cells had approximately 75 percent more glutathione than CS cells, and that the levels of this thiol were substantially reduced by treatment with NCX-4016.

These results suggest "a dual role for NCX-4016 in CR cells," state the investigators, as it provides both an antiproliferative effect and thiol depletion. "The thiol depletion creates an opportunity for cisplatin for further cell killing." ◆

States with Laws Addressing Smoking in Bars (as of September 30, 2005)



Since 1993, 10 states have enacted laws that specifically address smoking in bars or taverns. Of the states with such laws, all prohibit smoking in such locations. The State Cancer Legislative Database (SCLD) Program defines a bar or tavern as a location, independent or part of a restaurant or food service establishment, where alcoholic beverages are sold for onsite consumption.

NCI's SCLD Program, Bethesda, Md. • www.scld-nci.net

(Director's Update continued from page 2)

improve the quality and effectiveness of research in this field by helping to bring together vascular biology and angiogenesis researchers from different disease disciplines; establishing more effective ways for exchanging information, resources, and data; identifying areas of research that may benefit from more intensive study; and helping to train the next generation of researchers. TARP members are beginning to plan the next workshop to discuss state-of-the-art preclinical and clinical research on angiogenesis and vascular biology, and to promote interdisciplinary interactions. It is anticipated that this will be an annual meeting that includes NIH scientists and representatives from academia and industry.

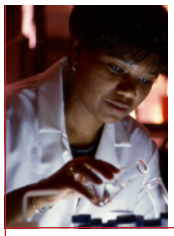
According to one estimate, more than 500 million people stand to benefit from anti- or pro-angiogenesis treatments in the coming decades. Viewed in that light, it's easy to see why there is so much enthusiasm about and interest in this area of investigation. Its promise is great, and our duty is to fund the best science, encourage collaboration, and leverage our resources to fulfill that promise. ◆

(Spotlight continued from page 3)

"There are different forms of lung cancer, and we think a combination of drugs that has multiple targets is likely to be the best strategy for chemoprevention," says Dr. Steele, adding, "It is difficult to predict what kind of lung cancer a person is going to get."

In humans, aerosols can be delivered either as a liquid or a very fine powder. "Engineers have come up with devices for both kinds of delivery, and we're trying to identify and develop the drugs to put in them," says Dr. Steele. ◆

By Edward R. Winstead



Featured Clinical Trial

Preventing Bone Fractures in Prostate Cancer Patients

Name of the Trial

Phase III Randomized Study of Zoledronate for the Prevention of Skeletal-Related Events in Patients with Prostate Cancer and Bone Metastases Undergoing Androgen Deprivation Therapy (CALGB-90202). See the protocol summary at http://cancer.gov/clinicaltrials/CALGB-90202. This trial was previously featured in the September 7, 2004, *NCI Cancer Bulletin*.

Dr. Matthew Smith

Principal Investigator

Dr. Matthew Smith, Cancer and Leukemia Group B

Why This Trial Is Important

Advanced prostate cancer often spreads to bones, a condition called bone metastases. Men with bone metastases are at risk for a variety of complications, including bone pain, fractures, and spinal cord compression. The mainstay of treatment for metastatic prostate cancer is androgen deprivation therapy, a treatment that markedly reduces levels of testosterone and other androgens (male hormones) in the body.

This study will evaluate the ability of zoledronic acid (Zometa), one of a family of drugs known as bisphosphonates, to prevent bone complications when administered at the same time as or shortly following androgen deprivation therapy. Currently, zoledronic acid is given to prostate cancer patients after androgen deprivation has stopped working.

"We know that zoledronic acid inhibits bone resorption and that it reduces problems such as fractures, spinal column compression, and pain associated with bone metastases after androgen deprivation therapy has failed," said Dr. Smith. "The question this trial intends to answer is whether giving zoledronic acid to patients earlier, while they are still responding to androgen deprivation therapy, will result in improved outcomes."

Who Can Join This Trial

Researchers seek to enroll 680 patients with confirmed diagnoses of prostate cancer and bone metastases who are undergoing androgen deprivation therapy. See the list of eligibility criteria for this trial at http://cancer.gov/clinicaltrials/CALGB-90202.

Study Sites and Contact Information

Study sites in the United States are recruiting patients for this trial. See the list of study site contacts at http://cancer.gov/clinicaltrials/CALGB-90202, or call 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

TRWG Convenes National Roundtable

Last week, the Translational Research Working Group (TRWG) took the next major step in its 18-month effort toward future NCI investments in translational research (TR). TRWG co-chair Dr. Ernie Hawk, director of the Office of Centers, Training and Resources, and 62 other TRWG members invited 140 experts and stakeholders to Phoenix for a roundtable discussion. Their task was to recommend how NCI can help improve the efficiency, productivity, and speed of translational progress.

TRWG conducted a review of NCI's current investments in TR and shared early analyses, which suggested that more than $1.5 billion went to fuel TR in FY 2004, with funds distributed across most divisions and programs. "Clearly," noted Dr. Hawk, "communication, coordination, and collaboration—within and beyond NCI—are essential to realize the full potential of NCI's TR portfolio."

In breakout discussions, the roundtable analyzed TR from three perspectives: translational pathways to clinical goals, populations that researchers hope to benefit, and crosscutting themes. Participating were representatives from academia, the pharmaceutical and device industries, advocacy organizations, major cancer research organizations, federal agencies, and British scientists who recently led a similar effort in the United Kingdom. These discussions will be the basis for draft recommendations to be released for public comment in the spring.

Researchers Discuss Biomarker Discovery at Annual U.S.-Japan Meeting

The discovery of biological markers using genomic and proteomic technologies headlined the Ninth Annual U.S.-Japan Cellular and Gene Therapy Conference held February 23 at NIH. Thirteen scientists presented their data, including Dr. Jeffrey Green of CCR's Transgenic Oncogenesis Group and Dr. Jun Wei of NCI's Pediatric Oncology Branch. Dr. Green discussed conserved genetic networks in mouse and human mammary cancers and the added value of the mouse in biomarker discovery. In a talk entitled "Translational Genomics in Cancer," Dr. Wei presented research on developing biomarkers for distinguishing neuroblastoma from other cancers and for predicting patient outcomes.

Rodriguez Joins Proteomics Technologies Program

Dr. Henry Rodriguez, who has extensive experience in cancer research, free-radical biology, technology development and assessment, research programs, and systems design, recently joined NCI's Office of Technology and Industrial Relations as the director of the Cancer Proteomics Technologies program. As a postdoctoral candidate, he identified molecular mechanisms by which potent carcinogens induce the mutations that turn normal cells into tumor cells. He also focused on the development of new measurement techniques to understand how free radicals damage DNA and their role in cancer development and age-related diseases.

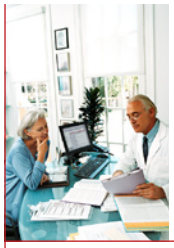
Dr. Rodriguez has led several programs in biological standards development at the National Institute of Standards and Technology, including protein detection and measurement platforms. He earned his doctorate in cell and molecular biology from Boston University and holds an M.B.A. from Johns Hopkins University School of Business and Management.

At NCI, Dr. Rodriguez will facilitate the implementation of the clinical proteomic technologies initiatives that seek to develop and assess proteomic technology platforms for cancer research.

TCGA Biospecimen Core Resource RFP Is Issued

NCI and the National Human Genome Research Institute recently launched The Cancer Genome Atlas (TCGA) Pilot Project, a 3-year study aimed at performing a comprehensive genomic analysis for a small number of select tumor types. The pilot project is designed to assess the feasibility of a larger-scale effort, with specific emphasis on the ability to identify genomic changes that may inform new clinical interventions in cancer diagnosis, treatment, and prevention. As part of the pilot project, NCI will establish a centralized Biospecimen Core Resource to acquire material from existing cancer tissue repositories. This facility will perform pathology verification on the biospecimens and distribute quality-assured genomic material for analysis to TCGA cancer genome characterization centers and genome sequencing centers.

NCI has issued a request for proposals (RFP) to identify a contractor to build the Biospecimen Core Resource. NCI expects to hold a preproposal conference for potential applicants on March 16. Questions about this RFP should be submitted by e-mail to jlewis@mail.ncifcrf.gov or by fax to 301-228-4037. ◆



CCOP Profile

SHCC Minority-Based Community Clinical Oncology Program

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Background

Members of the SHCC MBCCOP

Stroger Hospital of Cook County (SHCC), initially named Cook County Hospital, became a Minority-Based Community Clinical Oncology Program (MBCCOP) in June 2002. The SHCC MBCCOP has recruited more than 300 patients to nearly 30 NCI-approved clinical trials, the majority of which are breast cancer studies. This MBCCOP has provided resources that deliver high-quality, state-of-the-art cancer research and care to the medically underserved population in the Chicago metro area. The program consists of six surgical oncologists, five medical oncologists, two radiation oncologists, two pathologists, and one hematology oncologist. In addition to the physician base, the SHCC MBCCOP is supported by two CRA/physician assistants, one administrator, one senior research scientist, two laboratory technicians, two project assistants, five patient navigators, one statistician, and one IT professional.

Community Characteristics

SHCC is the major tertiary care site for the Cook County Bureau of Health Services and provides care regardless of patients' ability to pay. The majority of cancer cases come from more than 100 indigent, minority, or underserved neighborhoods. Patients are referred to SHCC from nearly 70 Chicago area clinics and hospitals.

Enrollment and Outreach Activities

Initial accrual at SHCC was mainly to the National Surgical Adjuvant Breast and Bowel Project (NSABP) breast cancer treatment studies. NSABP is 1 of 13 CCOP research bases that design and conduct large cancer treatment, control, and prevention studies. To improve recruitment, SHCC formed multidisciplinary teams to expand research to include other common solid tumor sites including head and neck, and colorectal cancers. Myeloma, lymphoma, and leukemia studies have been opened, and control and prevention strategies are being pursued.

Staff members provide emotional support and health education for patients and their families. They also provide access to screening and early diagnosis activities, help with navigation through complex medical systems with support for many languages, and support and advocacy for cancer survivors. Because many patients do not have primary care physicians, SHCC MBCCOP staff assist them with referrals to primary care physicians, social workers, and other specialty medical providers.

Other Key Facts

One of the requirements for an MBCCOP is accrual to cancer prevention and control trials, as well as to treatment trials. In addition to enrolling patients in breast cancer treatment and prevention trials through NSABP, SHCC has affiliated with the Moffitt Cancer Center and the University of Michigan CCOPs, and is collaborating with the University of Chicago and University of Illinois on prevention and control trials.

SHCC MBCCOP has created an Investigator Network Web site to help disseminate protocol information to investigators. Web site information includes protocol status, IRB and research base correspondence, protocol amendments, meeting minutes, and upcoming events and conferences. ◆

Featured Meetings and Events

A calendar of scientific meetings and events sponsored by the National Institutes of Health (NIH) is available at http://calendar.nih.gov. ◆

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.