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## Clinical Research Program Moves into the NJMS-UH Cancer Center



**Karen J Jackson**, Regulatory Compliance Coordinator; **Tracie K. Saunders**, Director of the Cancer Center Clinical Research Office; **Robert Wieder, MD, PhD**, Associate Director of the NJMS-UH Cancer Center for Clinical and Translational Research and **Yasmeen S. Barber**, Clinical Research Coordinator

The NJMS-UH Cancer Center Clinical Research Program relocated to the Cancer Center Building, along with the Medical Oncology practice and the Chemotherapy Unit. The program supports a multidisciplinary effort to translate laboratory-acquired insight in the biology of cancer into meaningful advances in the prevention, treatment and supportive care of cancer patients. The program has a

broad spectrum of cancer clinical trials available to patients and is one of only 16 NCI-designated Minority Community Clinical Oncology Programs (MB-CCOP) in the United States and its territories. This provides an opportunity for the cancer patients in the medically underserved population served by the center to participate in NCI-supported cancer treatment and control clinical trials to which they would otherwise not have access. Because of the wide range of the clinical trials open, the Cancer Center is often the only center in the region where certain trials are available. As a result, some cancer patients come here from faraway places for their treatment. In addition to NCI trials, the program offers specialized industry-sponsored clinical trials for tumor types for which NCI-supported trials are not available. Translational protocols initiated by Cancer Center physicians and scientists also provide opportunities for patients to participate in the most current concepts in treatment protocols, frequently when few other options are available.

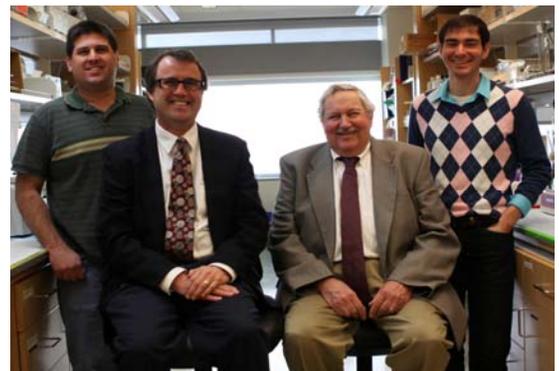
## The NJMS UH-Cancer Center Receives NCI Training Grant

The National Cancer Institute awarded the New Jersey Medical School-University Hospital Cancer Center nearly \$1 million for an interdisciplinary training grant that will focus on translational research. Efforts in recent years to bridge the research laboratory and the clinic have focused on increasing the exposure of clinicians to the research setting. Thus, the interdisciplinary pre- and post-doctoral training program that is funded by this new grant brings together 15 research faculty and 5 clinical preceptors from NJMS, and is designed to combine contemporary training in cancer research with a unique exposure to the culture of the cancer clinic. While the emphasis of the research component is on labora-

tory training in the molecular mechanisms of malignancy, the clinical exposure occurs through an innovative "Shadowing Program" that was designed specifically for the program. The goal of the shadowing program, which is the first of its kind at NJMS, is to provide a hands-on clinical exposure for trainees through a series of five clinical rotations. In these rotations the trainees will interact

directly with patients, and the clinical staff, and thus learn the roles and experiences of each of the members of a clinical team (from the nurses, residents, study coordinators, surgeons and pathologists to support

*Continued on page 6*



**Stephen Flowers, PhD**, Postdoctoral Fellow; **Ian Whitehead, PhD**, Professor and Director of the NJMS-UH Cancer Center; **Harvey Ozer, MD**, Professor and **Jonathan Gulto**, Pre-doctoral Fellow



Save the date:

Sunday, May 15th 2011

Komen North Jersey

## Director's Message



It's difficult to believe, but we are now approaching the 5<sup>th</sup> year anniversary of the opening of the New Jersey Medical School-University Hospital Cancer Center. As I look back at the past five years I realize they have been filled with successes, changes, and a few disappointments. It is my feeling that our greatest success lies in our vibrant research program. We now have 15 active research labs housed in our facility, which are staffed by over 100 postdocs, technicians, and graduate

students. Our grant portfolio continues to grow on an annual basis despite the scarcity of research dollars at the national level. In addition to the research activity, the Cancer Center faculty has designed a graduate level curriculum that is supported by a new NCI-funded T32 Cancer Training Grant. These courses have attracted increasing numbers of students each year providing valuable exposure for our research programs. We have also successfully renewed our R25 summer research program and we expect to be overrun by medical students again this summer. Finally, the Cancer Center is also responsible for the Cancer Clinical Trials Program. This program addresses access to advanced care for underserved populations and is supported by a CCOP grant from the NIH.

With time has also come change. Since opening we have welcomed four new laboratories into the Center (Dr. Maiese, Dr. Azzam, Dr. Howell and Dr. Fritton) and our research efforts have benefitted tremendously from these highly collaborative programs. One faculty member has left us (Dr. Harrison) and we wish him the best of luck in his new position. In July of 2010 our Director, Dr. Harvey Ozer, stepped down. Dr. Ozer had a vision of building a comprehensive cancer clinical research center in Newark. He leaves a tremendous legacy, and I believe it is our shared responsibility to ensure that this vision endures. Finally, I am sure you have all noticed the increased activity on the lower floors, and it appears that the clinical services are finally joining us in the building. The Clinical Research Office is already up and running, and Medical Oncology are unpacking their boxes. These are truly positive developments that should provide numerous opportunities for collaboration and growth.

Finally, a few disappointments. We've dealt with water issues, an interesting smell, and a car launched into the side of the building. Most of this of course can be attributed to the growing pains of a new building and hopefully the worst is behind us. Overall it's been an interesting and exciting time as the Cancer Center has developed into something we can all be proud of. Once again I would like to thank Dr. Ozer for his vision, and the opportunity he has provided us to be part of something new, important, and special.

Sincerely,

A handwritten signature in blue ink, appearing to read "I. Whitehead".

Ian P. Whitehead, PhD  
Director and Professor  
NJMS-UH Cancer Center



## Featured Researchers

### Utz Herbig, PhD, Awarded 1.6 Million from the NIH



**Utz Herbig, PhD**, joined the faculty of the NJMS-UH Cancer Center in the summer of 2006. Dr. Herbig's

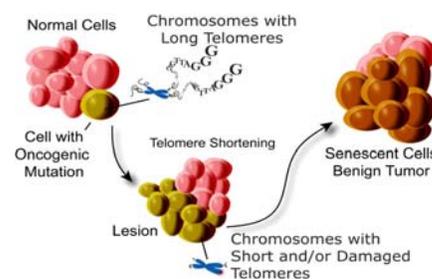
research focuses on cellular senescence, a stable cellular growth arrest with tumor suppressing functions and pro-aging properties.

Dr. Herbig was recently awarded 1.618 million for a 5 year NIH R01 grant entitled "Tumor Suppression by Telomere Dysfunction Induced Senescence". Precious studies in Dr. Herbig's laboratory have revealed that as cells divide and age the physical tips of chromosomes, called telomeres, progressively shorten and eventually become dysfunctional. Since cells with dysfunctional telomeres cannot grow anymore, they become se-

nescent. Telomere dysfunction-induced senescence (TDIS) could be the contributing factor to organismal aging, as senescent cells with dysfunctional telomeres accumulate in various organ systems in aging primates.

New studies in Dr. Herbig's laboratory have revealed that TDIS appears to function as a critical, prevalent, and universally acting tumor suppressing mechanism in humans. Formation of malignant cancer is generally a slow and multi-step process. Frequently, cancer growth initiates from a single cell as a result of DNA mutations that lead to activation of an oncogene. However, soon after abnormal cells have multiplied several times, cell proliferation often ceases again resulting in formation of benign cancer precursor lesions. The reason for the inactive nature of these lesions is because their cells had undergone TDIS (see Figure). This new NIH grant will be used to further

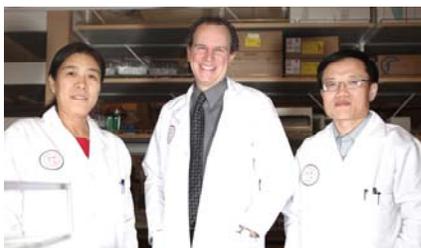
investigate this phenomenon. In addition to characterizing the reasons for telomere dysfunction in pre-cancerous human cells, his research will determine how important TDIS is in preventing the progression of a variety of distinct human cancers, such as breast-, colon-, lung-, prostate-, and skin-cancers. Dr. Herbig's work will lead to a better understanding of cancer progression in humans and will aid in the development of novel anti-cancer therapies.



**Telomere Dysfunction Induced Senescence**

### Kenneth Maiese, MD, Newest Resident Laboratory to the Cancer Center

The NJMS-UH Cancer Center welcomes Kenneth Maiese, MD. He is the newly appointed chair of Neurology and Neurosciences at NJMS. Dr. Maiese is a noted researcher whose work has been recognized by the NIH along with several other agencies. He holds several patents and is editor-in-chief of two international journals. Dr. Maiese's laboratory is located on the F level of the Cancer Center. Their work focuses on the basic and clinical



**Yan Chen Shang**, Principal Research Technician, **Kenneth Maiese, MD**, Professor and Chair, Chief of Service, Neurology and Neurosciences and **Zhao Chong, PhD**, Assistant Professor

mechanisms that modulate both neuronal and vascular plasticity as well as inflammatory mechanisms in the body. Their investigations are designed to translate basic science into clinical applications which would hopefully lead to the successful therapeutic treatment of clinical neurological and vascular disorders, such as cardiovascular disease, stroke, cancer, diabetes, and Alzheimer's disease.

### Devendra Bajaj, PhD, Receives the NSBRI Postdoctoral Fellowship Award



**Devendra Bajaj, PhD**, was recently awarded a 2-year National Space Biomedical Research Institute (NSBRI) Postdoctoral Fellowship.

Dr. Bajaj completed his PhD dissertation in Mechanical Engineering in May of 2010 at the University of Maryland, Baltimore County where he studied hard tissue damage processes in teeth. He is a post-

doctoral fellow in the laboratory of Dr. J. Christopher Fritton in the Cancer Center.

Dr. Bajaj's fellowship project entitled "Pharmaceutical Countermeasure Effects on Tissue-Level Quality of Immobilized Bone" will quantify the long-term effects of bisphosphonates on bone tissue fragility in an established animal model for reduced weight bearing. Bisphosphonates are the most common drugs prescribed for the treatment of bone cancers and postmenopausal

osteoporosis. They work by slowing the cellular processes responsible for bone tissue turnover, thus decreasing bone loss and are currently under investigation in astronauts. However, their effects have not been well studied in the setting of reduced weight bearing. Therefore, this study is important toward ascertaining the biomechanical safety of bisphosphonates for preventing the rapid bone loss associated with spaceflight and disuse.

## Meet Our Faculty



**Edouard Azzam PhD  
Professor**

My laboratory studies the effects and underlying mechanisms of low dose ionizing radiation in normal human cells, with particular interest in the radiation-induced by-stander effect and the radiation-induced adaptive response.



**Satnam Banga, PhD  
Assistant Professor**

We have been studying human diploid fibroblasts (HF) to understand the mechanism of multi-step carcinogenesis ("transformation") of such cells in culture and its effect on cellular aging.



**Betsy Barnes, PhD  
Assistant Professor**

The long-term research goal of my laboratory is to characterize the cellular pathways that are regulated by the IRF family of transcription factors.



**Christopher Fritton,  
PhD  
Assistant Professor**

We study how mechanical (exercise) and hormonal (estrogen) signals affect cellular and tissue repair mechanisms in bone and bone marrow.



**Utz Herbig, PhD  
Assistant Professor**

Our lab is studying whether telomere induced senescence contributes to tumor suppression and organismal aging in mammals.



**Roger Howell, PhD  
Professor  
Chief, Division of  
Radiation Research**

The research in my laboratory focuses on the biological effects of radioactive materials as they relate to both radiation protection and radiation therapy.



**Sergei Kotenko, PhD  
Associate Professor**

Research in my lab is aimed to advance our knowledge of the complex role played by various cytokines in the regulation of the immune response to and in the pathogenesis of a number of diseases including cancer



**Steven Levison, PhD  
Professor  
Director, Laboratory  
for Regenerative  
Neurobiology**

The overall goal of my research program is to better understand the signals that regulate the proliferation and differentiation of the stem cells in the central nervous system.

## Meet Our Faculty



**Hong Li , PhD**  
Associate Professor  
Director, Center for  
Advanced Proteomics  
Research

One of the goals of my laboratory is to develop and optimize mass spectrometry technologies to study the role of protein post-translational modifications and protein-protein interactions on cell function.



**Kenneth Maiese, MD**  
Professor  
Chair, Neurology and  
Neurosciences

We focus on the basic and clinical mechanisms that modulate both neuronal and vascular plasticity as well as inflammatory mechanisms in the body.



**Elizabeth Moran, PhD**  
Professor

We study the molecular mechanisms that regulate the different patterns of gene expression seen in cancer cells compared with their normal counterparts.



**Harvey Ozer, MD**  
Professor  
Associate Dean For  
Oncology Programs

We study how altered cellular gene expression is responsible for immortalization, my lab is assessing differences in cDNA libraries between pre-immortal and immortal cells.



**Ian Whitehead, PhD**  
Professor  
Director, NJMS-UH  
Cancer Center

Our laboratory conducts research in the field of mammalian signal transduction, with a particular interest in small G proteins and their contribution to human cancer.



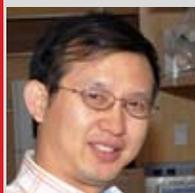
**Robert Wieder, MD,  
PhD**  
Associate Professor  
Associate Director for  
Clinical & Translational  
Research

Our laboratory studies the mechanisms of dormancy and resistance to chemotherapy in breast cancer cells that metastasize to the bone marrow.



**Teresa Wood, PhD**  
Professor  
Rena Warshow En-  
dowed Chair for M.S.  
Vice Chair for Basic  
Science Research

A major focus of my laboratory is in determining how hormones and peptide growth factors interact to promote growth, survival and differentiation of breast epithelial cells.



**Lizhao Wu, PhD**  
Assistant Professor

My laboratory is primarily interested in understanding how the Rb/E2F pathway and other tumor suppressor/oncogenic pathways control normal development and cancer.

## Our Research

### Prevention of Breast Cancer Recurrence

Breast cancer cells metastasize to the bone marrow very early in the disease, frequently before a diagnosis is made. Many of these micrometastases resist the adjuvant chemotherapy specifically administered to eliminate them and have the capacity to remain dormant in the bone marrow microenvironment for many years. These cells are intimately associated with the bone marrow stromal cells that normally serve to protect hematopoietic stem cells from injury and depletion for the lifetime of the individual. The cancer cells bind proteins in the stroma and initiate survival signaling. They enter a state of dormancy as a consequence of this interaction. Under DOD and NCI supported grants, the Wieder lab is investigating the signaling that keeps these cells dormant as well as potential mechanisms responsible for awakening them. They are testing the hypothesis that injury to the stroma through oxidative or hypoxic stress as well as the lack of postmenopausal estrogen induces an inflammatory state in the stroma, which results in secretion of growth factors that stimulate the dormant breast cancer cells to reawaken. Their goal is to characterize this inflammatory process, demonstrate that it induces reawakening of breast cancer micrometastases and to study ways of suppressing it to prevent recurrence.

### Investigations of Breast Cancer Origins

The cause of breast tumor diversity is of current interest in the breast cancer field. Recent and emerging data suggest that breast tumor characteristics result from both the mutation that gives rise to the tumor as well as the cell of origin in which the mutation occurs. It is clear from recent studies that different subtypes of immature cells, e.g. stem cells and progenitor cells, versus mature, differentiated cells have differential susceptibilities to tumor development and can give rise to distinct tumor subtypes. Studies in Dr. Teresa Wood's laboratory, funded by the National Institutes of Health and the New Jersey Commission on Cancer Research, are focused on determining how immature breast stem/progenitor cells are formed and how alterations in the numbers of these cells influence breast cancer susceptibility and tumor diversity.

The Wood laboratory is particularly interested in how growth regulators such as insulin and insulin-like growth factors (IGFs) regulate breast stem/progenitor cell lineage populations and tumor

susceptibility. A number of studies have implicated this signaling system in breast cancer susceptibility. The Wood laboratory has recently demonstrated that disruption of IGF and/or insulin receptor signaling in breast epithelial cells in mice alters the populations of stem/progenitor cells resulting in a specific increase in luminal progenitor cells. The luminal progenitor cell population has received recent attention as the cell of origin for specific breast cancer subtypes including the more aggressive basal-like tumors resulting from BRCA1 mutations. The Wood laboratory is investigating how IGF/insulin receptor regulation of these progenitor cells alters susceptibility to specific oncogenes or tumor-promoting agents in order to better understand the causes of breast cancer diversity and to identify novel prevention and treatment strategies. In addition, these growth regulatory pathways also are likely involved in determining the number of tumor initiating cells, the cells capable of reforming tumors following chemotherapy.

### The NJMS UH-Cancer Center Receives NCI Training Grant *(Continued from page 1)*

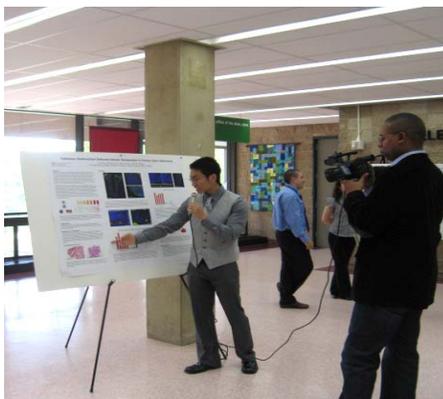
staff). It is expected that this exposure will allow for a better understanding of the work flow in a cancer clinic, and provide a context for their laboratory research. This should facilitate their future careers as translational researchers through their understanding of the team approach that is required to shepherd laboratory discoveries to the bench and back.

## Programs and Events

### Cancer Summer Student Research Program

The Cancer Summer Student Research Program has been in existence at NJMS since 1969 and is supported through an NCI Cancer Education Program Grant (P.I.s Harvey Ozer, MD and Gwendolyn Mahon, PhD). In 2010, it was renewed at an expanded level for an additional 5 years. Its purpose is to provide a mentored, short-term research experience and inspire and motivate New Jersey medical students to pursue an investigative career in oncology, as well as to appreciate the value and importance of biomedical research.

To ensure that medical students receive the best research experience, the program advisory committee continues to develop new aspects to the program. Not only do students present their research at the end of the program at our annual symposium and submit an abstract which is published in our Abstract Booklet but they



*NJMS Medical student presents his poster at the 2010 Cancer Summer Program Symposium*

also attend interdisciplinary tumor conferences where patient cases and clinical trials are discussed. Students also attend mandatory weekly seminars which help broaden their understanding of cancer research beyond that provided by the project in which they are engaged. The seminar topics range from "The Biology of Cancer" to "Design and Management of Clinical Trials". Students are also encouraged to be interactive during the seminars.

The 2011 program begins June 7th and ends July 29th. The project directory is currently available on our website at <http://njmsuhcc.umdj.edu/home>. Interested students should contact the faculty mentor

and submit a completed student application form, only after they have been accepted, to Lorie-Anne Phillips at the Cancer Center Research Support Office on H level room H1202.

### NJMS-UH Cancer Center researchers chosen to present their work at the American Association of Cancer Research 2011 National Meeting

Dr. Ru Chen and Dr. Sri Harikrishna Vellanki, postdoctoral researchers in the NJMS-UH Cancer Center, were asked to present their work at the 2011 Annual Meeting of the American Association of Cancer Research. Dr. Chen's work was selected from hundreds of submitted abstracts for an oral presentation at a special symposium on chromatin structure and transcription factors. Her studies have focused on understanding the molecular mechanisms of Chronic Myelogenous Leukemia (CML). Using a novel animal model she has identified a unique molecular signature that can be targeted in the treatment of patients with CML. Targeted therapies have been highly successful in the treatment of patients with CML, and Dr. Chen's work may lead to improved thera-

pies for patients with more advanced disease. Dr. Vellanki's work was selected for presentation in a poster session, and described the development of a microfluidic device that can be used to interrogate individual tumor cells. This new technology allows for the identification of multiple surface proteins on tumor cells, even when only a few cells are available, and thus overcomes a serious limitation in the diagnostic analysis of malignancies. Dr. Chen performed her work in the laboratory of Dr. Ian Whitehead, Director of NJMS-UH Cancer Center, while Dr. Vellanki works in the laboratory of Dr. Robert Wieder, the Associate Director for Clinical and Translational Research.



*Ian Whitehead, PhD, Director of NJMS-UH Cancer Center, Ru Chen, PhD, Sri Harikrishna Vellanki, PhD and Dr. Robert Wieder, MD/PhD, Associate Director for Clinical and Translational Research.*

### Graduate Students Win Awards at the 3<sup>rd</sup> Annual Inter-School Technology Symposium



*Rivka Stone, graduate student in the laboratory of Betsy Barnes, PhD, NJMS-UH Cancer Center*

Ms. Dan Li and Ms. Rivka Stone won second and third place, respectively, at the Third Annual Inter-School Technology Symposium held at Robert Wood Johnson Medical School on April 12<sup>th</sup>. Their work highlighted the use of innovative and cutting edge technologies in the areas of imaging, next generation genomics and diagnostics. Ms. Li established a non-invasive prostate cancer monitoring system by combining a living

imaging system (IVIS) with a luciferase reporter allele, while Ms Stone's work described the use of next-generation sequencing technologies to characterize expression and alternative splicing of IRF5 in patients with systemic lupus erythematosus (SLE).

Both students received awards in the form of mini-grants to cover costs of services rendered at one of UMDNJ's research core research facilities.



*Dan Li, graduate student in the laboratory of Lizhao Wu, PhD, NJMS-UH Cancer*



## About Us

The NJMS-UH Cancer Center, which opened in October of 2006, provides the opportunity to integrate the delivery of the highest quality clinical care and the application of innovative basic and translational research.

The 9-story, 220,000 square foot building is physically connected to University Hospital on levels A, B and C, which accommodates clinical services, clinical research, screening and education programs and administrative offices. Besides having over 70,000 square feet of laboratory space, the Cancer Center is the home to five NJ Medical School Core Research Facilities which are located on levels F, G and H Level. The Digital Imaging Core houses 2 confocal microscopes, a PALM laser capture scope, tissue processing services and a host of support resources. The Center for Advanced Proteomics Research offers a variety of equipment and services for the design, process, acquisition and analysis of proteomics-based research. The Cancer Center also contains satellite facilities of the Flow Cytometry and Comparative Medicine Cores, and is home to the Clinical Research Group.

I level serves as an NIH funded comparative animal facility and the remaining two levels are shell space for future expansion and a mechanical floor.

## Contact Our Research Support Staff



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