

# New CRI scientist leads fifth laboratory

## Jian Xu, Ph.D.

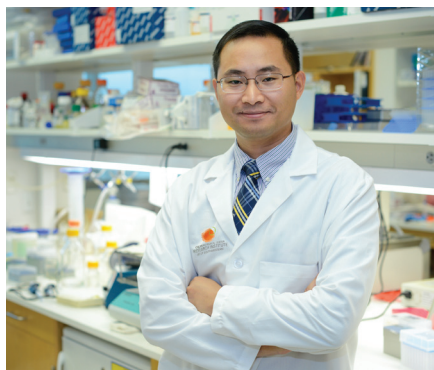
*Assistant Professor in the CRI and of Pediatrics  
CPRIT Scholar in Cancer Research*

THERE'S EVERY REASON to believe that Dr. Jian Xu's work is going to produce significant results for the Children's Medical Center Research Institute at UT Southwestern (CRI). He's already contributed to significant scientific discoveries, and his research is a perfect match for CRI's mission.

Dr. Jian Xu became the CRI's fifth faculty member in September. His recruitment was generously supported by the Moody Foundation. His laboratory will focus on childhood leukemia with the long-term goal of understanding stem cell development and how misregulation can cause cancer.

"Dr. Xu was highly sought by a number of leading research institutions, and we were fortunate to succeed in recruiting him to Dallas," said Dr. Sean Morrison, director of the CRI and principal investigator of the Hamon Laboratory for Stem Cell and Cancer Biology.

Dr. Xu said: "CRI seeks to understand the biological basis of disease, and I have dedicated all my work to this. Development of new drugs and new treatments



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– Dr. Jian Xu

has little chance if scientists don't first have a full understanding of disease. CRI is a leader in research because the people here know that the basic science must be understood first."

Dr. Xu earned a Ph.D. at the University of California, Los Angeles, and was a Helen Hay Whitney Fellow at Boston Children's Hospital and Harvard Medical School before moving to Dallas. His work on stem cells has resulted in articles in the *Proceedings of the National Academy of Sciences* and *Genes & Development*. ❖

## RESEARCH HIGHLIGHTS

### New technique identifies mesenchymal stem cells

M ESENCHYMAL stem cells (MSCs) are the primary cells involved in bone formation and repair after injury, but identifying and characterizing MSCs in the body has been difficult.

Now, however, CRI scientists under the direction of Dr. Sean Morrison have developed new techniques that attach a "biomarker" to MSCs, enabling them to be localized and characterized. This finding significantly advances the field of MSC biology and opens up new possibilities for treating bone fractures and cartilage injuries.

"We found that a protein known as a leptin receptor can serve as a biomarker to accurately identify MSCs in adult bone marrow," said Dr. Morrison, director of the CRI and principal investigator of the Hamon Laboratory for Stem Cell and Cancer Biology. Dr. Morrison is also a professor of pediatrics at UT Southwestern, holder of the Mary McDermott Cook Chair in Pediatric Genetics, a Howard Hughes Medical Institute investigator, and a Cancer Prevention and Research Institute of Texas Scholar in Cancer Research. ❖

### Mechanism found in metabolic pathway that fuels cancers

A RESEARCH TEAM led by Dr. Ralph DeBerardinis has taken a significant

## RESEARCH HIGHLIGHTS

step in cracking the code of an atypical metabolic pathway that allows certain cancerous tumors to thrive.



Dr. Ralph DeBerardinis

They have identified the triggering mechanism that plays a key role in causing a series of energy-generating chemical reactions, known as the Krebs cycle, to run in reverse.

"With this finding, we have learned there are particular enzymes that work together to enable the reverse pathway to function, much like the tiny gears that turn in opposite directions to power a mechanical clock," said Dr. DeBerardinis, director of CRI Genetic and Metabolic Disease Program and associate professor in the Eugene McDermott Center for Human Growth and Development, and of pediatrics at UT Southwestern. He also holds the Joel B. Steinberg, M.D., Chair in Pediatrics and is a Sowell Family Scholar in Medical Research.

The identification of the mechanism could provide a future target for drugs that would attack tumors that rely upon the reverse pathway to provide energy for growth. Tumors of this type tend to be difficult for oncologists to treat because cells using the atypical pathway seem to resist chemotherapy. This new discovery may provide a way to starve and kill the tumors. ❖

### CRI scientists pinpoint gene that promotes childhood cancers

RESEARCHERS at the CRI have identified a gene that contributes to the development of several childhood cancers. The study was conducted in mice, but if the findings prove to be applicable to humans, the research could lead to new strategies for treating childhood cancers.

"We have shown that Lin28b – a gene that is normally turned on in fetal but not adult tissues – is active in several childhood cancers, including neuroblastoma, Wilms' tumor and hepatoblastoma, the most common liver cancer in pediatric patients," said Dr. Hao Zhu, a principal investigator at the CRI, assistant professor of pediatrics and internal medicine at UT Southwestern, and a CPRIT Scholar in Cancer Research. "We found that overproduction of Lin28b specifically causes hepatoblastoma, while blocking Lin28b impairs the cancer's growth."

Further research in Dr. Zhu's lab will seek to determine if the blocking that works in mice tumors is also effective in humans. ❖

### CRI named Innovation Catalyst by Dallas Regional Chamber

THE CHILDREN'S MEDICAL CENTER Research Institute at UT Southwestern has been named by the Dallas Regional Chamber as a 2014 Innovation Catalyst award recipient. It is an award given annually to a company or institution that strengthens the region's capacity for innovation.

"As we continue to recruit the best scientists, take risks to solve important problems and integrate science with medicine, we are creating a culture of innovation at CRI that is yielding exciting discoveries and profound opportunities," said Dr. Sean Morrison, director of the CRI. Currently employing 70 biomedical researchers and staff, CRI has succeeded in recruiting top-tier faculty in each of its first three years of operation. A number of high-impact discoveries have already been made at CRI. So far in 2014, CRI researchers have published 18 papers in scientific journals, of which five were published in the highest-impact journals. In 2013, CRI researchers published 24 papers in scientific journals, of which 10 were published in the highest-impact journals.

CRI's published discoveries are already leading to clinical trials to test new therapies for incurable diseases, including a Phase 1B clinical trial that is now underway to assess a novel drug combination in stage IV melanoma patients based on discoveries made in Dr. Morrison's laboratory. CRI researchers also have been exceptionally successful at leveraging philanthropic investments with extramural grant funding from the Cancer Prevention and Research Institute of Texas, the National Institutes of Health, the Howard Hughes Medical Institute, and other medical research organizations. Overall since its inception, CRI has attracted \$37 million in extramural grant funding, an exceptional figure for a new institute. ❖