Vanderbilt, GE Team to Achieve Deeper Understanding of Colon Cancer

- **GE advanced cancer mapping technology to provide unprecedented studies of cancer cells**
- **Could yield new insights into how colon cancer develops, progresses and can be suppressed**

**NISKAYUNA, NY, February 12, 2013** – Vanderbilt University has partnered with GE Global Research, the technology development arm for the General Electric Company (NYSE: GE), to better define – at the cellular level – how colon tumors form and develop.

The research, supported by a five-year, $3.75 million grant from the Office of the Director of the National Institutes of Health (NIH), will test GE’s revolutionary cancer mapping technology, an automated platform that can probe and analyze up to 60 different disease markers, including proteins and messenger RNAs, in a single tissue sample. The ability to study dozens of markers at one time provides a more complete picture of what’s happening with the cancer. Currently, a diagnosis of cancer and the decision of which therapy to prescribe are based on the histology of the tumor and, in some cases, the expression of just one or two disease markers inside a patient’s tumor.

The award is part of a new NIH-funded Single Cell Analysis Program that aims to “understand what makes individual cells unique and to pave the way for medical treatments that are based on disease mechanisms at the cellular level”.

The GE-Vanderbilt project, led by GE scientists Michael Gerdes, Ph.D. and Kashan Shaikh, Ph.D., and by Robert Coffey, M.D., Ingram Professor of Cancer Research at Vanderbilt, will explore how intestinal stem cells of the colon contribute to tumor formation and progression, and the signaling pathways associated with the disease.

“With GE’s cancer mapping technology, we’re enabling cancer to be viewed in ways it couldn’t previously be seen such as with the activation of different signaling pathways in specific cells,” said Gerdes, lead scientist at GE Global Research. “With unprecedented views, we hope will come unprecedented insights that tell us more about how cancer forms, how it progresses, and most importantly, how to defeat it.”
GE scientists have developed novel technology that allows a single tissue section from a sample that is removed during surgery, to be imaged for biosignatures including expression of dozens of proteins and nucleic acids (RNA and DNA) without destroying the integrity of the sample.

“As we have learned, no two patient’s cancer is exactly the same. With colon cancer, some patients exhibit a more aggressive form of the disease compared to other patients,” said John Burczak, Advanced Technology Leader in Molecular Imaging at GE Global Research. “We want to understand these subtleties, so that one day therapies can even be specifically tailored for each patient.”

Gerdes added that the goal is to identify “the mechanisms that drive the aggressive nature of the cancer, and the role that cancer stem cells play in therapeutic resistance.”

A primary issue in cancer diagnosis today is the limited amount of molecular information that is available about a particular cancer. With little information, it's difficult to determine more specific characteristics of cancer that could reveal how fast or slow it may be growing. New breakthroughs in molecular diagnostics are starting to change this paradigm.

GE’s cancer mapping technology will be tested with investigators at Vanderbilt from the Epithelial Biology Center that Professor Coffey directs.

The Coffey lab recently reported the discovery of a new population of relatively quiescent (inactive) intestinal stem cells. These cells express a protein called Lrig1 that acts as a tumor suppressor. This discovery has “given us an entrée to develop some very robust models of colon cancer,” Coffey said.

The GE-Vanderbilt work is funded by NIH grant 1R01CA174377-01. Coffey’s research is also supported by the National Cancer Institute (2P50CA095103 – Molecular Imaging and Targeted Therapeutics of Stem Cell-Derived Colon Cancer).

About GE Global Research

GE Global Research is the hub of technology development for all of GE’s businesses. Our scientists and engineers redefine what's possible, drive growth for our businesses, and find answers to some of the world’s toughest problems.

We innovate 24 hours a day, with sites in Niskayuna, New York; San Ramon, California; Bangalore, India; Shanghai, China; Munich, Germany; and Rio de Janeiro, Brazil.

About Vanderbilt University Medical Center
Vanderbilt University Medical Center is a major referral center for the Southeast and nation. Through Vanderbilt University Hospital, the Monroe Carell Jr. Children’s Hospital at Vanderbilt and other clinical facilities, it provides several regional services, among them a Level 1 Trauma Center, a comprehensive Regional Burn Center and a Level 4 Neonatal Intensive Care Unit. VUMC encompasses the highly ranked Vanderbilt University School of Medicine, Vanderbilt University School of Nursing and Ph.D. programs in the biomedical sciences. Its cutting-edge research enterprise is nationally known for translating scientific discoveries into advances in patient care. For more information, see [www.mc.vanderbilt.edu](http://www.mc.vanderbilt.edu).

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