News

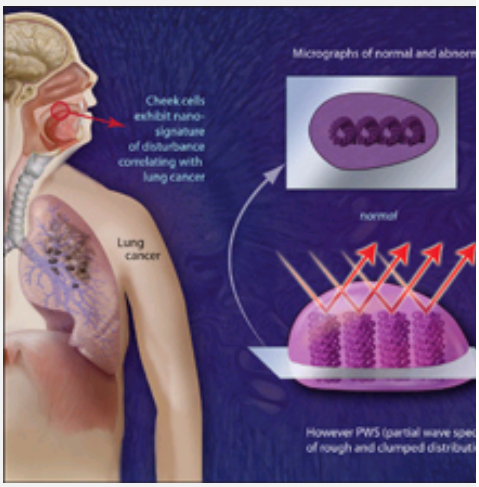
News
News From the Field
For the News Media
Special Reports
Research Overviews
NSF-Wide Investments
Speeches & Lectures
NSF Current Newsletter
Multimedia Gallery
News Archive

News by Research Area
Arctic & Antarctic
Astronomy & Space
Biology
Chemistry & Materials
Computing
Earth & Environment
Education
Engineering
Mathematics
Nanoscience
People & Society
Physics

Press Release 10-177

Cheek Swab May Detect Lung

In clinical trial, technique appears to detect lu
tumor



Nano-scale disturbances in cheek cells indicate the
Credit and Larger Version

October 5, 2010

Early detection is critical for improving cancer surviv
cancers in the United States, lung cancer, is notoriou
stages.

Now, researchers have developed a method to detec
diffuse light on cells swabbed from patients' cheeks.

In a new clinical study, the analysis technique--calle
microscopy--was able to differentiate individuals wit
even if the non-cancerous patients had been lifetime
obstructive pulmonary disease (COPD).

The findings-released by a team of engineers and ph
Health System, Northwestern University and New Yo
Oct. 15, 2010, issue of the journal *Cancer Research*

"This study is important because it provides the proc
intrusive, risk-stratification technique may allow us t
the leading cause of cancer deaths in Americans," sa
Roy of NorthShore University HealthSystems and the
author on the paper. "This represents a major step f
optics breakthroughs for personalized screening for

The recent results are an extension of several succe
scattering analysis technique, including early detecti
and colon cancer. NSF has supported the team's wo
Roy's collaborator and co-author, bioengineer Vadim
University.

"Their work has now transitioned to a larger $2 milli
and Innovation award," said Leon Esterowitz, a biop
at NSF who has long supported the research. "The r
in that the techniques and the 'field effect' may be a
applied to a multitude of epithelial cancers, the mos

The continuing clinical and laboratory experiments ir
technique-and its predecessor technologies, four-din
fingerprinting (4D-ELF) and low-coherence enhanced
(LEBS)-are revealing new information about the cha
emerges somewhere in the body.

Within affected cells, including otherwise healthy cel
molecules in the nucleus and cellular skeleton appea
200 nanometers or less, even to the scale of molecu
becomes so distorted that light scatters through the

The ability of cancer to cause changes in distant, hea
or "field of injury" effect, and is the physical mechan
reveal changes triggered by a tumor far off in a pati

"Microscopic histology and cytology have been a sta
micro-scale alterations in cell structure," added Back
conventional microscopy is limited. PWS-based nano
cellular alterations at the nanoscale in otherwise mic

"What is intriguing is that the very same nanoscale a
very different types of cancer including lung, colon a
continued. "Not only does this suggest that nanocyto
general platform for cancer screening, but also that
ubiquitous event in early carcinogenesis with critical
Elucidating the mechanisms of these alterations will
of carcinogenesis and improve screening."

This research was supported by the National Science
grants over the last decade, including CBET-093977

Read more about the work in the Northwestern Univ

-NSF-

Media Contacts
Joshua A. Chamot, NSF (703) 292-7730 jchamot@ns
Megan Fellman, Northwestern University (847) 491-3
Jim Anthony, NorthShore University HealthSystem (8
janthony@northshore.org

Program Contacts
Sohi Rastegar, NSF (703) 292-8305 srastega@nsf.go
Leon Esterowitz, NSF (703) 292-7942 lesterow@nsf.g

Principal Investigators
Vadim Backman, Northwestern University (847) 467

Co-Investigators
Hemant Roy, NorthShore University HealthSystems
roy@northwestern.edu

The National Science Foundation (NSF) is an indepen
fundamental research and education across all fields
year (FY) 2010, its budget is about $6.9 billion. NSF
grants to nearly 2,000 universities and institutions. E
competitive requests for funding, and makes over 11
awards over $400 million in professional and service


Get News Updates by Email