World Gold Council and Professor Qun Huo Developing Rapid Cancer Biomarker Test using Gold Nanoparticles

World Gold Council-supported research targets advancement towards rapid and easy to use cancer diagnostics

05 May 2009: World Gold Council (WGC) and Professor Qun Huo, associate professor at the University of Central Florida, today announced advancements in the development of a test for the rapid detection of cancer biomarkers using gold nanotechnology. Feasibility studies have shown that the test is highly sensitive, is very easy to use and has the potential to provide major improvements in early cancer detection and diagnosis.

The test is based on an innovative technology called nanoDLSAY and is the first test to use dynamic light scattering and gold nanoparticle probes to detect cancer biomarkers. Gold nanoparticles are very stable and have strong light scattering properties, much more so than biomolecules and polymer particles, and therefore can be detected by dynamic light scattering, with high sensitivity. This means that the test can detect cancer biomarker at very low levels. Such highly sensitive tests will be very valuable for early cancer detection and also for monitoring cancer recurrence after surgery.

The nanoDLSAY technology was developed by Professor Huo at University of Central Florida's NanoScience Technology Center. To bring this technology to market, Professor Huo started a company called Nano Discovery, LLC. Professor Huo's research at Nano Discovery LLC is supported by the WGC's Gold Research Opportunities Worldwide (GROW) Programme which co-funds potential new scientific and industrial uses of gold.

This innovative test is very simple, fast and involves a single step procedure which requires only a very small sample. It is very cost effective and can be carried out very quickly (typically the test is completed in a few minutes or within half an hour) in central clinical testing labs or in point-of-care facilities such as hospitals, clinics, and doctors' offices.

The potential uses of this technology are extensive. It is a platform technology that can be used for both research and for *in vitro* diagnostic purposes. This technology may also be a valuable tool for drug screening and development by pharmaceutical industry. Although the technique has been developed initially for screening prostate and other cancers, it can also be applied to other human diseases and conditions, such as infectious and sexually transmitted diseases, neurodegenerative diseases and cardiovascular diseases. It can also be used for illegal performance drug monitoring and biodefense.

Dr Richard Holliday, Head of Industrial Applications, at the World Gold Council, said:

"The properties of gold have long been applied to medicine and science. This development shows that the metal, which has been around for thousands of years, is still being used in the most advanced scientific processes to find new ways to diagnose and fight modern illnesses. The GROW programme has been successful in identifying and supporting this very valid and relevant research. This is our first significant project in this area, but the biomedical applications for gold are an important area that we will continue promoting in the future."

Professor Qun Huo, University of Central Florida said:

"The support of the WGC's GROW programme is invaluable to the advancement of this research. In addition to the funding, the experience of the WGC team in promoting the uses of gold in medicine has been an enormous help to my goal of bringing this technology to market."

Professor Huo's company will seek to partner with a dynamic light scattering (DLS) manufacturing company to co-develop a prototype DLS instrument that is specifically designed to conduct the nanoDLSAY. Prototype products will then undergo product testing in selected locations in the U.S. medical community.

Once fully developed, the nanoDLSAY test should be available to the biotechnology and pharmaceutical industries for research purposes within three years and to the diagnostic market in three to five years

Ends

Innovative nanoDLSAY test
The innovative procedure involves exposing a sample of the patient's blood or serum to gold nanospheres covered with antibodies against a particular cancer biomarker. These nanospheres attach to and surround biomarkers in the sample. A beam of light is then shone through the sample and measurements of the scattered light can quantify the size of nanospheres in the solution, and therefore the concentration of the cancer biomarker.

World Gold Council GROW Program
The WGC's Gold Research Opportunities Worldwide (GROW) Program co-funds potential new scientific and industrial uses of gold. For example, the programme has recently supported the development of an inkjet printable gold ink in conjunction with Johnson Matthey. The GROW programme is supported by a long-established and extensive network of experts, the Editorial Board of World Gold Council's peer reviewed journal Gold Bulletin and the Technical Committees of World Gold Council scientific conferences, who provide technical advice to the programme.

Each year World Gold Council provides financial support, via its GROW (Gold Research Opportunities Worldwide) programme, to a limited number of research and feasibility studies aimed at uncovering potential new industrial uses for gold. For more information please visit: http://www.utilisegold.com/wgc_initiatives/research_funding/

About World Gold Council
World Gold Council (WGC), a commercially-driven marketing organisation, is funded by the world's leading gold mining companies. A global advocate for gold, the WGC aims to promote the demand for gold in all its forms through marketing activities in major international markets. For further information visit www.gold.org.

Gold in Cancer testing and treatment
Gold in the treatment of cancer dates back to 1955[1]. More recently, new treatment technologies under development rely on the ability of tiny gold nanoparticles to specifically collect in a cancerous tumour by passing through leaky blood vessels attached to a tumour. So, when injected into a patient, there is a means by which a potent anti-cancer compound attached to a gold nanoparticle, can be directly and accurately delivered to a tumour whilst avoiding healthy body tissue. Such an effective drug delivery mechanism with reduced toxicity is considered to be a major step-forward, limiting such side effects as lowered immunology and hair loss.

For further information and to arrange an interview please contact:

Richard Holliday, Head of Industrial Applications, at the World Gold Council on +44 (0) 207 826 4712, or richard.holliday@gold.org

Mary Clark, Capital MS&L on +44 (0) 207 307 5336, or mary.clark@capitalmsl.com

Helen Essex, Capital MS&L on +44 (0) 207 307 5343, or helen.essex@capitalmsl.com

[1] Experiences with the Use of Radioactive Colloidal Gold in the Treatment of Cancer, H. B. Wheeler, W. E. Jaques, and T. W. Botsford, *Ann. Surg.* 1955, 141(2): 208–217