

PRESS RELEASE

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## **Leonardo Biosystems and NanoMedical Systems Sign Collaboration Deal for Manufacturing Scale Up of Leonardo's Drug Delivery Nanoparticles**

Houston & Austin, TX – November 28, 2011 – [Leonardo Biosystems, Inc.](#) and [NanoMedical Systems, Inc.](#) (NMS), two emerging drug delivery companies, today announced that they have signed a development contract in which NMS will develop and establish a commercial process to manufacture nanoporous silicon particles for Leonardo's multi-stage drug delivery system.

"The expertise in the fabrication of massively-parallel nanofluidic structures in silicon gained in the development of our own drug delivery products enables us to support Leonardo in bringing their manufacturing process to a commercial performance level," said Randy Goodall, President and CEO of NanoMedical Systems. "Our medical device engineering quality system is designed to produce an FDA-compliant process that will bring Leonardo to the doorstep of clinical testing of their innovative drug delivery products."

With the support of university researchers and NMS, Leonardo has formed prototype particles, demonstrating all the necessary unit processes to make the particles. Under the collaboration, NMS will engineer, refine, and integrate these steps in a manner that prepares Leonardo for manufacturing particles suitable for clinical trials.

"NMS's familiarity with silicon materials and their capability to do the work under an FDA-compliant quality system makes them an ideal partner," said Bruce D. Given, M.D., CEO of Leonardo Biosystems. "Creation of a commercial-scale manufacturing process compliant with regulatory requirements is on the critical path for Leonardo to translate its exciting animal proof of concept data into clinical reality. With NMS as a partner, we look forward to moving ahead aggressively with our development program."

### **About Leonardo's multi-stage system**

Leonardo's lead technology consists of fully biodegradable, porous silicon particles smaller than a red blood cell, which can be loaded with a diverse array of secondary nanoparticles such as liposomes, micelles, carbon nanotubes, dendrimers and metallic nanoparticles. In addition to

bypassing many of the body's natural defenses that lead to rapid clearance of nanoparticles administered alone, Leonardo's particles can be designed to seek out tumor vasculature and can be tuned to create an intravascular depot, providing sustained release following a single intravenous injection.

#### **About Leonardo Biosystems, Inc.**

Leonardo Biosystems is a drug delivery company built around technology developed by Dr. Mauro Ferrari, one of the world's best-known nano-science innovators. Leonardo has a multi-stage delivery platform that has been shown in animal models to be highly effective in targeting delivery of siRNA and small molecule drugs. Leonardo is a portfolio company of Arrowhead Research Corporation ([NASDAQ: ARWR](#); [NASDAQ: ARWRD](#)). For more information, please visit [www.leonardobiosystems.com](http://www.leonardobiosystems.com).

#### **About NanoMedical Systems, Inc.**

NanoMedical Systems is a privately held, drug delivery company developing implantable devices that use silicon nanochannel technology invented by Dr. Mauro Ferrari, an original innovator in the field of Bio-MEMS. NanoMedical Systems implant platform, the Personalized Molecular Drug-delivery System includes a first generation device (PMDS-1) customizable for months of constant release of a wide range of drug and biologic molecules with a second generation device (PMDS-2) that will provide variable controlled release via programming, remote control, and sensors. The PMDS-1 has demonstrated the sustained delivery of therapeutics from small molecules to peptides and proteins in both in vitro and in vivo studies. For more information, please visit [www.NanoMedSys.com](http://www.NanoMedSys.com).