



## BACKGROUND INFORMATION ON TECHNOLOGY MATURATION FUND AWARD WINNERS

### **4D Medical Systems** (Oak Ridge)

Contact: Joseph Ortiz

**Project Title:** Visualization Decision and Support Solution

**Project Focus:** To support the development and launch of a Visual Decision Support Solution to analyze images collected in healthcare-related activities.

**Project Description:** Digital photo processing is an integral part of many projects, but because of the nature of photographs many human hours are required to interpret the images. With the advent of electronic medical records, there is a great opportunity to include photographic data in a patient's medical record. 4D Medical Systems is developing a turnkey solution to enable healthcare providers to quickly and easily incorporate photographic data into patient records. The award is intended to fund early commercialization efforts of their nearly complete first generation 2D system and to fund early-stage development of their next generation 3D imaging system.

### **Foundation Instruments** (Collierville)

Contact: Gary Emmert, Ph.D.

**Project Title:** An Inexpensive Kit For the Analysis of Two Regulated Drinking Water Disinfection By-Products

**Project Focus:** To develop a low-cost drinking water contamination test kit that will allow facilities to measure contaminants in the home.

**Project Description:** The availability of safe drinking water is essential for any community to thrive. In response to this need, the U.S. Environmental Protection Agency will increase the stringency of the standards by which it evaluates drinking water in early 2012. Foundation Instruments has developed a simple, relatively inexpensive kit to test the quality of drinking water. This kit is intended to cost-effectively help facilities meet these new standards. Currently, facilities must send out water samples for testing, which results in a two-week lag from sample collection and contaminant readout. The kit provided by Foundation Instruments will cost less than outsourcing the tests and will allow the facility to obtain the results in a matter of hours. The kit has been shown to be highly accurate even when performed by a moderately skilled operator. This award is intended to provide bridge funding to facilitate the rollout of their product.

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## **LED North America (Oak Ridge)**

Contact: Andrew Wilhelm

**Project Title:** Advanced Thermal Management of LED Luminaries Using Carbon Foam Technology

**Project Focus:** To develop a LED-based, energy-efficient lighting system that is capable of cost effectively replacing current commercial lighting solutions.

**Project Description:** Light emitting diodes (LEDs) are highly efficient at converting electricity into light. However, their short life span is one of the major hurdles preventing mass-market adoption as a commercial lighting source. The lifetime of an LED is related to its operating temperature. Researchers at the Oak Ridge National Laboratory have developed a low-density carbon foam that is capable of rapid and efficient heat transfer. LED North America has licensed this technology and has demonstrated, in a proof of concept design, that addition of the carbon foam to a high-output LED array can dramatically decrease the operating temperature. Correspondingly, the decreased operating temperature increases the longevity of the array such that LED North American can potentially warrantee the product for 10 years. The award is intended to fund research and development of a production model and to identify the most cost-effective incorporation of carbon foam into LED lamps.

## **Nutraceutical Discoveries (Knoxville)**

Contact: Michael Zemel, Ph.D.

**Project Title:** Innutria - Weight Management Solution For Pets

**Project Focus:** To test the effectiveness of its nutraceutical product, Innutria, as a weight-loss additive that helps obese pets lose weight.

**Project Description:** Obesity in pets follows that of their human counterparts with 44% of dogs and 57% of cats being classified as overweight or obese. Current weight-loss solutions for pets function by adding filler to the food to reduce the caloric content. Nutraceutical Discoveries is taking a different approach and is using cellular-based assays to show that its mixture, called Innutria, will directly affect the fat storage process in cells. As a food additive, Innutria has the potential to help obese animals lose weight by altering this cellular process. The award is intended to fund a double-blind clinical trial to evaluate the effectiveness of the product.

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**Phenotype Screening Corporation (Knoxville)**

Contact: Daniel McDonald

**Project Title:** Advanced Plant Characterization For Crop Improvement

**Project Focus:** To develop an automated system to rapidly evaluate the roots of crop variants using an established low-energy, X-ray imaging technology.

**Project Description:** Agriculture research and development aims to develop crops with increased output per plant. One of the best indicators for increased output is a robust root structure. In order to find strains with the best root structure, researchers must cross breed and evaluate the root structures of thousands of specimens. As a first step toward reducing the effort required for this procedure, Phenotype Screening Corporation has already developed and marketed RootVis, a low-energy, X-ray imaging system for analyzing the root structure of plants. This award is intended to support the research and development of an automated version of the RootVis platform that will dramatically increase the efficiency of the screening method.

**The University of Tennessee Research Foundation (Knoxville)**

Contact: Gary Sayler, Ph.D.

**Project Title:** Novel Bioluminescent Cell Lines For Advanced Biomedical Imaging Technologies

**Project Focus:** To develop cell lines with bioluminescence properties that enable a lower cost, more robust pharmaceutical screening platform.

**Project Description:** The first step in developing a drug is to identify a starting compound to build upon. Often this starting compound is obtained through structured screening procedures. The biggest challenge in developing a screening procedure is identifying a reporting mechanism to measure the desired outcome. The novel bioluminescent cell line, developed at the University of Tennessee at Knoxville, has the capability of providing an improved reporting mechanism. This new reporting mechanism improves upon the current technologies by not requiring the addition of expensive substrates and by providing real-time as opposed to time-point-based output. The award is intended to fund development of the cell line to better tune its properties for effective use in pharmaceutical screening applications.

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**The University of Tennessee Research Foundation (Knoxville)**

Contact: Jimmy Mays, Ph.D.

**Project Title:** Superelastomers™ - New Thermoplastic Elastomers Based On Multigraft Copolymers

**Project Focus:** To develop efficient manufacturing processes of a next generation soft plastic called Superelastomers™.

**Project Description:** Plastics are used in a wide variety of products. Thermoplastic elastomers are a type of plastic that are recyclable, soft and easily manipulated. The Superelastomers™ developed at the University of Tennessee Research Foundation hold great potential to produce new and improved plastic-based products such as high-dexterity surgical gloves. One major challenge in the commercial application of the technology is the lack of an efficient and reliable manufacturing procedure. The award will be used to optimize the manufacturing procedures for Superelastomers™ with the intent of making the product more appealing to commercial partners.

**Venture Incite and Y12 National Security Complex (Oak Ridge)**

Contact: Shawn Carson

**Project Title:** Code 4 Armor - A Cermet Technology

**Project Focus:** To develop next-generation body armor for military personnel that provides greater protection with less weight than the current armor.

**Project Description:** Keeping soldiers safe is a vital concern for the military. Since the Vietnam War, advances in body armor and medical technologies have reduced the rate of combat-related mortalities from 28% to 12%. In an effort to continue this trend, researchers at the Y12 National Security Complex have developed a new body armor composite that is as strong as steel, but weighs only half as much. The researchers have been able to demonstrate the materials effectiveness at the proof of concept stage; however, they now must develop a commercially viable manufacturing process. The award will help finance this process.