



InfraRed Imaging Systems, Inc.
116 Research Drive
Bethlehem, PA 18015
610-849-5034

January 25, 2010

Ohio Third Frontier / Medical Imaging Program
Ohio Department of Development
Technology and Innovation Department
77 South High Street, 25th Floor
Columbus, OH 43215

Dear Sir:

This letter serves as our Notice of Intent to submit a grant proposal to the Ohio Third Frontier's Medical Imaging Program.

Lead Applicant Name: InfraRed Imaging Systems, Inc.

Ohio Address: 34459 Curtis Blvd.
Eastlake, OH 44095

Phone: 614-989-1148

Corporate Address: 116 Research Dr.
Bethlehem, PA 18015

Phone: 610-489-5034

Contact Persons: Dale Siegel
President & Founder
Email: dsiegel@irimagesys.com
Phone: 614-989-1148

Michael D. Schlesinger
Vice President
Email: mschlesinger@irimagesys.com
Phone: 908-522-1893

Project Title: Completion of Commercialization and Relocation of Manufacturing to Ohio of the INRIS *VascularViewer* Product Portfolio

Estimated Requested Grant Funding: \$635,000

Collaborators: Astro Manufacturing & Design
34459 Curtis Blvd.
Eastlake, OH 44095
Entrotech, Inc.
1275 Kinnear Rd.
Columbus, OH 43212

United Medical
9865 Archer Lane
Dublin, OH 43017
614-582-9622
Columbus, OH

Corporate Description

InfraRed Imaging Systems, Inc. (INRIS), an Ohio corporation, is developing its first product the *VascularViewer*® which provides real-time images of peripheral arteries and veins using near InfraRed Light (nIR). The underlying technology is covered by a Wright Patterson Air Force Base patent describing the use of nIR to visualize subdermal structures; the patent is exclusively licensed to INRIS. The *VascularViewer* has been cleared by the FDA as a visualization aid to the performance of vascular access. The level of image accuracy, clarity and detail, and the simplicity of interpretation of the images of both arteries and veins is unparalleled and compelling to clinicians. It enables doctors and nurses to more accurately and efficiently insert needles and catheters. Consequently, it saves hospitals labor, materials and advanced procedure costs by reducing the number of “sticks” and peripheral vascular access failure. The technology has been described as “disruptive” because of the thought it will broadly change the way doctors and nurses gain both venous and arterial access. Additionally, the technology is a platform from which other potentially very significant products may evolve.

As instructed in the Fiscal Year 2010 Request for Proposals, a one page Project Description is attached.

Sincerely,

[SIGNATURE]

Dale Siegel
President
InfraRed Imaging Systems, Inc.
614-989-1148
dsiegel@irimagesys.com

Project Description

Completion of Product Development

Development and Implementation of Market Indicated Changes in the Functionality of the *VascularViewer*: The *VascularViewer* as currently configured is being used in a number of hospitals including the Mayo Clinic and St. Jude Children's Research Hospital and this use has provided market feedback suggesting improvements that should be made in the device prior to a broad approach to the market. These improvements include a redesign of the roll-stand and scope arm to permit easier positioning of the scope, improvements in the control of nIR intensity and the addition of convenience features to the roll-stand, all of these engineering design changes can be executed by Astro Manufacturing and Design of Eastlake, Ohio.

Development of Manufacturable Disposable nIR Light Source: In order to allow hands-free use of the *VascularViewer*, the nIR light source needs to be held against the skin of the patient by an adhesive appliance which also serves to provide a means to prevent the spread of infection by the nIR light source between patients as well as to constrain nIR from the light source. As a consequence of multiple discussions resulting from the use of a prototype but non-disposable nIR light source, a completely new and patentable disposable light source has been conceptualized and a non-working prototype assembled. The prototype has been enthusiastically appraised at a number of institutions particularly because it complies with recent changes in hospital reimbursement policies and is particularly appropriate for use with infants and the elderly. Cost considerations of a disposable require a significant redesign of the electronic and mechanical engineering of the product and production engineering by Entrotech, Inc. of Columbus, Ohio which will manufacture the product for commercial purposes.

Regulatory Affairs and UL Requirements: The various procedural and documentation requirements of Good Manufacturing Practices need to be completed prior to commercial launch of the *VascularViewer*. Various engineering changes in the product will necessitate submission of the changes for UL certification.

Manufacturing

Transition of Manufacturing from California to Ohio: Various procedures, computer files for computer assisted machining, printed circuit board printing and component specifications need to be obtained from California vendors and contractors. New component sources and contractors, in most cases known by and geographically local to Astro, will need to be developed by Astro.

Cost Reduction: The current cost of goods for the *VascularViewer* is based on limited quantity purchase. In addition, no efforts have been expended to find least cost components or component vendors. Astro has agreed to undertake this effort on behalf of INRIS.

Sales and Distribution

Market Development: At least initially, INRIS has decided to use regional specialty distributors for its product including United Medical Products of Dublin, OH. This method of distribution requires INRIS to create market knowledge and demand. Promotional materials including website enhancement, attendance at relevant trade shows and internet prospect development will be undertaken by INRIS using Ohio vendors.

Clinical Support: Distributors do not provide the required level of in depth clinical sales and training expertise. United Medical will retain Ohio nurses to help build the market and fulfill sales and training expertise needed in their distribution territory.



OTFMIP 10-927

3640 Colonel Glenn Hwy.
Dayton, OH 45435-0001
(937) 775-2425
FAX (937) 775-3781
e-mail: rsp@wright.edu

January 25, 2010

Lead Applicant Information:	Organizational Name:	Wright State University
	Primary Point of Contact:	Thomas N. Hangartner, PhD, FAAPM
	Title:	Distinguished Professor of Biomedical Engineering, Medicine & Physics
	Phone:	(937) 775-5070
	Email:	thomas.hangartner@wright.edu
	Address:	Wright State University 207 Russ Engineering Center 3640 Colonel Glenn Hwy. Dayton, OH 45435

Proposal Title: Demonstration and Commercialization of Magnetic Resonance Imaging Fatigue Task Card

Proposed Budget: \$1M Third Frontier Research and Development Fund (TFR&DF)
\$1M Wright Capital Fund (WCF)
\$1M Supplemental White Paper

Collaborators: Wright State University through its Wright State Research Institute will serve as the lead applicant and program manager. We are honored to be joined by a world class group of collaborators including the **Kettering Health Network Innovation Center, Siemens Medical Imaging, daytaOhio, EMTEC, and the US Air Force Research Laboratory (AFRL)**. Each collaborator brings a unique and valuable set of intellectual and capital resources to the team. Technical expertise will come from eminent researchers supported by Ohio Third Frontier's Research Scholar Program through the Ohio Imaging Research and Innovation Network (OIRAIN) as well as from faculty members who are part of the Ohio Center of Excellence in Human Centered Innovation at Wright State University. AFRL will serve as a research collaborator and help drive the development of the Fatigue Task Card towards satisfying warfighter requirements in the area of human performance. The Kettering Health Network Innovation Center will provide facilities, space, equipment, researchers, and a clinical test bed for applied research and accelerated commercialization. daytaOhio will provide technical support and software application development. Siemens will serve as a commercialization partner, with support from EMTEC, and provide product marketing and technical oversight to ensure the end product meets market demand.

Summary of Proposed Effort: The goal of the proposed project is to enable Ohio to be a leader in medical imaging technology commercialization focused on human performance in the defense and commercial markets. This project leverages on the scientific expertise of researchers associated with Ohio Third Frontier's Research Scholar Program through the Ohio Imaging Research and Innovation Network (OIRAIN), the newly formed University System of Ohio Center on Human Centered Innovation, the established fatigue research program at the Kettering Health Network, and state-of-the-art clinical equipment infrastructure from Siemens, an industry leader in medical imaging, and other partners to demonstrate and commercialize magnetic resonance imaging technologies for measuring and predicting fatigue in individuals. This application area is a topic of significant

interest to the US Air Force Research Laboratory and the 711th Human Performance Wing, which represents a \$300 million investment at Wright-Patterson Air Force Base in Dayton, Ohio.

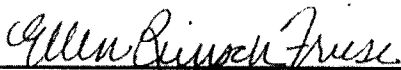
Project Background: Cognitive impairment and other health risks due to fatigue induced by sleep deprivation have been recognized as serious effects jeopardizing both human performance and safety for many years. For example, in the military the effects of mental and physical fatigue on Air Force pilots during a strategic or tactical bombing campaign have been shown to have a significant impact on pilot performance as well as safety. Fatigue is also known to have significant consequences in the workplace, with some of the most devastating accidents occurring in everyday settings such as hospitals and industrial and engineering sites where shift workers often suffer from chronic sleep deprivation. Other markets include the trucking industry, railway engineers, air traffic controllers, and commercial pilots. Despite these effects, currently there is not a commercially available tool which can be used to determine which individuals are best suited to perform fatigue-intensive work and which are not.

Over the last three years, in collaboration with AFRL, a fatigue research program has studied the neural mechanisms of fatigue and its effects over a broad range of the population, including Air Force pilots during extended tactical bombing campaigns, medical residents during shifts greater than 24 hours, and in cancer patients undergoing radiation and chemotherapy. This research has generated a wealth of knowledge related to the effects of fatigue on the brain and the neural markers associated with vulnerability to fatigue.

The objective of this proposal is to use these findings to develop a magnetic resonance imaging (MRI) Fatigue Task Card which can be used to as a tool to both measure and predict the effects of fatigue in individuals. The tool will be developed to operate in concert with the Siemens Syngo operating system and marketed to a worldwide MRI customer base. Below is a short summary of the anticipated benefits of this proposed activity:

1. Understand the effects, prediction, and countermeasures to fatigue from high performance work environments to shift work.
2. Support the performance of warfighters and the competitive advantage to the US and Ohio workforce while improving health and wellness.
3. Advance this emerging science and new MRI application within the newly formed Center of Excellence at WSU, bridging the needs of the 711th HPW and civilian applications.
4. Create positive economic impact and high-value job creation through commercialization.
5. Move a major research center of our commercial partner, Siemens, to the State of Ohio.

Wright State University Institutional Official



Ellen Reinsch Friese, Assistant Vice President for Research

Hansen, Andrew

From: Kumar Parekh [kumar@irdiagnostyx.com]
Sent: Monday, January 25, 2010 12:46 PM
To: OTFMIP2010
Subject: 2010 OTFMIP LOI
Attachments: Letter of Intent.docx

Hello Sir/Madam,

We would like to submit a proposal for the Ohio Third Frontier grants. Below is the information required for the letter of intent.

Lead Applicant's name: IR Diagnostyx Inc.
Address: 1275 Kinnear Road, Columbus, OH - 43212
Phone number: 614-296-4213
Contact person: Gary Smith
Email address: smithg@irdiagnostyx.com
Proposed Project title: Diagnosis of Interstitial Cystitis and other functional diseases
Estimated Grant Funds to be requested: \$500,000
Known Collaborators: The Ohio State University

Attached is the 1 page summary of the proposed project. Please let us know if you have any questions.

Warm Regards,
Kumar Parekh

IR Diagnostyx Inc.
1275 Kinnear Road
Columbus, OH 43212
Phone: 859-229-7803
kumar@irdiagnostyx.com

Company Background

IR Diagnostyx, Inc. is a Columbus, Ohio-based startup company that specializes in providing accurate, painless, and rapid diagnostic services for several functional diseases. IR Diagnostyx will initially establish a laboratory in Columbus that will provide diagnostic services to the United States and abroad. We anticipate creating as many as 30 jobs in central Ohio in the first five years of operation. The executive team includes Gary Smith, Hardik Desai and Kumar Parekh.

Intellectual Property

Dr. C. A. Tony Buffington and Dr. Luis Rodriguez-Saona, distinguished faculty and research professionals at The Ohio State University (OSU) have developed a biomarker discovery platform technology for the diagnosis of Interstitial Cystitis and other functional syndromes. The technology is based on Spectroscopic analysis of the blood specimen observed under an **Infrared Microscope**. This patent-pending analysis clearly indicates whether or not the patient suffers from the particular disease. More than \$100,000 has already been invested in this research. OSU has filed a patent application for the technology that is applicable to over 40 functional diseases most of which currently have no easy diagnostic test. IR Diagnostyx has established a partnership with OSU and has secured an option for the development and commercialization of this technology for the use of the greater medical community.

Unmet Needs

The healthcare system currently lacks accurate diagnostic methods for over 30 functional diseases including Interstitial Cystitis (IC), Irritable Bowel Syndrome (IBS), Fibromyalgia, and Chronic Fatigue Syndrome (CFS). Combined, these four diseases affect over 110 million Americans. A typical patient may have painful symptoms for more than four years and interact with as many as five physicians before achieving a correct diagnosis. Patients spend thousands of dollars trying to find the cause of their illness. Preliminary analysis shows that average cost to diagnose these diseases is above \$5,000. These costs do not include the cost of misdiagnosis and subsequent treatment of misdiagnosis, if any, in the process. The medical community, insurance providers and patients are all very frustrated currently because of the lack of reliable, accurate and conclusive diagnosis.

Service Description

The company is working with the lead scientists in completing the development of the technology. After that the company will be providing diagnostic services to the medical community. The diagnostic test provided by the company will work as a replacement for the complicated set of diagnostic procedures currently performed. The physicians will typically order this test series of tests for their patients to determine whether or not the patient is suffering from the particular diseases mentioned above or not. The IR Diagnostyx test will replace most of this series of tests currently being used.

Competition

Currently, the only way to diagnose these diseases is through the traditional exclusion method used by physicians around the world. These procedures are expensive, inaccurate, and take years to reach a conclusion. In the mean time, patients suffer unnecessarily. All of the 40 diseases that we have identified have similar existing diagnostic methods.

Market Opportunity

In United States alone, there are about 85 million people suffering from IBS, 13 million suffering from IC, 10 million people suffering from Fibromyalgia and about 4 million people suffering from CFS. The prevalence (% of total population) of these diseases is very similar in Canada, UK, Europe and other developed countries as well. In a simplified survey of urologists in central Ohio, the physicians indicated that they would use our diagnostic test to test for IC only as many as 8 times per week. When extrapolated across the 12,000 urologists in the US, the market for IC only is approximately \$100 million at \$200 per test. This does not include the dozens of other functional diseases for which our patent-pending diagnostic procedure is applicable.

OTFMIP 10-929

GE Healthcare
Technologies



January 22, 2010

Ohio Department of Development
Technology & Innovation Division
77 South High Street 25th Floor
Columbus, Ohio 43215
OTFMIP2010@development.ohio.gov

RE: 2010 OTFMIP LOI

Dear Medical Imaging Administrator,

GE healthcare is pleased to submit this letter of intent (LOI) in preparation for submittal of our proposal in response to the FY2010 Ohio 3rd Frontier Medical Imaging RFP.

Lead Applicant:

Vivek Bhatt, GM of GEHC Coils, Inc
GE Healthcare Technologies
1515 Danner Drive
Aurora, Ohio 44202-9273
Ph. 330-995-8592
Email: vivek.bhatt@ge.com

Project Title: Interventional MRI Imaging Coil Technology Development

Estimated Grant Funds: \$1,000,000

Known Collaborators: TBD

Project Summary:

Magnetic Resonance Imaging (MRI) provides unique benefits in obtaining exquisite detail of soft tissue definition in anatomical images of patient anatomy. Traditionally, MRI has played a significant role within the realm of diagnostic imaging. This program advances the role of MRI by enabling the administration of various methods and therapies for the treatment of disease through the creation of specialized interventional MR imaging coil technologies.

Minimally Invasive therapies such as laser induced thermal ablation (LITT), cryoablation, RF ablation, microwave ablation and others benefit greatly with the use of MRI. MRI provides the ability to accurately establish the target for the therapy probe placement, verify probe placement, monitor the administration of the ablative therapy and assess the results of treatment. MR has the unique ability to measure and monitor the temperature change in tissue undergoing thermal ablation and without the use of ionizing radiation.

Current RF imaging coil technology is targeted towards the diagnostic realm of imaging. This program will expand RF imaging coil technology to cater to the specific needs of interventional MR guided procedures. Coils for use in 1.5 and 3.0 Tesla MRI scanners specifically designed to accommodate sterile needle/probe placement will be designed. Specific considerations will be given towards the need for flexible RF coils designs that adhere to the curvature of anatomy while providing openings for interventional needle/probe placement under the constraints of a sterile environment.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Vivek Bhatt".

Vivek Bhatt,
GE Healthcare Technologies

OTFMIP 10-930

GE Healthcare
Technologies



January 25, 2010

Ohio Department of Development
Technology & Innovation Division
77 South High Street 25th Floor
Columbus, Ohio 43215
OTFMIP2010@development.ohio.gov

RE: 2010 OTFMIP LOI

Dear Medical Imaging Administrator:

GE Healthcare is pleased to submit this Letter of Intent (LOI) in preparation for submittal of our proposal in response to the FY2010 Ohio 3rd Frontier Medical Imaging RFP.

Lead Applicant:

Vivek Bhatt, GM of GEHC Coils, Inc.
GE Healthcare Technologies
1515 Danner Drive
Aurora, OH 44202-9273
Ph. 330-995-8592
Email: vivek.bhatt@ge.com

Project Title: MRI Imaging and Devices for Pediatric Patients

Estimated Grant Funds: \$1,000,000

Known Collaborators: Cincinnati Children's Hospital / Integra NeuroSciences Corporation, Cincinnati, Ohio

Project Summary:

Magnetic Resonance Imaging (MRI) provides unique benefits in obtaining exquisite detail of soft tissue definition in anatomical images of patient anatomy. To date there has been a strong focus on adult-based MRI radiology with less emphasis on the pediatric population. MRI devices designed specifically for pediatric MRI shows huge potential. It is especially important for neuro-imaging of the brain (primarily composed of soft tissue) and for torso imaging where traditionally x-ray based methods have been used with an associated risk from ionizing radiation. There is natural concern related to use of ionizing radiation with the pediatric population, and MRI in many cases is seen as the future method of choice.

This program will establish the specific needs of the pediatric radiologist for development of integrated MRI imaging coils and associated devices for child/pediatric diagnosis and surgery for use within 1.5 and 3.0 Telsa MRI scanners. We also anticipate evaluating additional design criteria relating to the incorporation of surgical navigation interface and surgical retraction devices.

Respectfully submitted,

Vivek Bhatt
GE Healthcare Technologies

Tursiop Technologies, LLC

January 21, 2010

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Dear Sir/Madam,

This Letter Of Intent serves to express our interest in submitting a proposal in response to the Request For Proposals in connection with the Ohio Third Frontier Medical Imaging Program for Fiscal Year 2010.

Information required in this connection is provided below.

Lead Applicant: Tursiop Technologies, LLC

Address: 11000 Cedar Ave. Suite 280, Cleveland OH 44106

Phone: 216-658-4521

Contact Person: Dr. Raju Viswanathan

Email address: raju@tursiop.com

Proposed Project Title: High-performance nanotechnology-based imaging coil and nanostructured contrast agents for enhanced MRI diagnostics

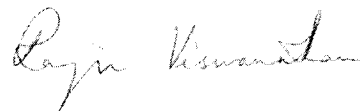
Estimated funds requested: \$ 800,000

Collaborators: Dr. Sergei Merkulov, LucCell Inc., Cleveland, Ohio; Veterans Administration Medical Center; Walter Reed Medical Center

A project summary is attached on the next page.

Please let me know if further information is needed.

Yours sincerely,



Raju Viswanathan, Ph.D.
Chief Technology Officer
Tursiop Technologies, LLC

Tursiop Technologies, LLC

Project Summary:

High-performance nanotechnology-based imaging coil and nanostructured contrast agents for enhanced MRI diagnostics

This project seeks to develop a high-performance MRI neuro imaging coil using Tursiop's proprietary technology involving nanomaterials, along with nanocontrast agents based on caged Gadolinium nanostructures, as a highly effective combination for enhanced image-based MRI diagnosis.

Magnetic Resonance Imaging (MRI) is the imaging modality of choice in many medical diagnostic applications, and particularly in the case of neuroradiological medicine. Incidence of Traumatic Brain Injuries (TBI) has increased in the military, together with Post Traumatic Stress Disorder (PTSD), and there is an urgent need for better diagnostic and treatment methods in this context. Tursiop Technologies, LLC, is developing a dramatically improved series of MR Imaging coils based on its proprietary nanotechnology-based signal acquisition technology for high performance imaging that can yield images with significantly enhanced Signal-to-Noise Ratio (SNR) over that available with conventional methods.

The primary endpoint of the project is a high performance neuro imaging coil at 1.5T that can offer very good SNR performance for optimized imaging well beyond that possible with conventional commercial coils available today. This will be configured as a multi-channel phased array capable of high resolution imaging.

As a secondary endpoint, in conjunction with a high performance head coil for imaging at 1.5T, this project seeks to evaluate high performance nanoparticle-based contrast agents that offer the promise of high MRI contrast with low toxicity. The contrast agents we intend to evaluate will be modified Gadofullerenes. By virtue of the encapsulated structure of the Gadofullerene, the toxicity associated with such contrast agents can be very low or non-existent. The addition of suitable side groups may permit tuning the contrast for specific markers, besides potentially enabling binding to other biochemical agents for easy removal from the subject. Binding to markers such as specific proteins in stem cells can enable MRI tracking of the survival and viability of implanted stem cells.

The evaluation of neurological disorders generally relies on direct (structural) diagnostic imaging both with and without contrast agents, as well as on functional MRI (fMRI) evaluations that seek to pinpoint abnormalities associated with neurological function. Correlations between structural and functional studies can also aid diagnosis. The imaging coil and contrast agents developed in this project will enhance both structural and functional evaluations in the neuroradiological context.

By augmenting signal and contrast both on the signal acquisition end (high performance imaging coil) as well as on the molecular contrast end (modified Gadofullerene agents), this project can lead to a variety of high-impact medical diagnostic applications.

11000 Cedar Avenue,
Suite 280
Cleveland, OH 44106
216.658.4521 office

Tursiop Technologies, LLC

January 21, 2010

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Dear Sir/Madam,

This Letter Of Intent serves to express our interest in submitting a proposal in response to the Request For Proposals in connection with the Ohio Third Frontier Medical Imaging Program for Fiscal Year 2010.

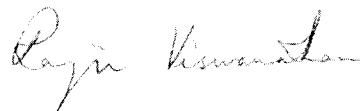
Information required in this connection is provided below.

Lead Applicant: Tursiop Technologies, LLC
Address: 11000 Cedar Ave. Suite 280, Cleveland OH 44106
Phone: 216-658-4521
Contact Person: Dr. Raju Viswanathan
Email address: raju@tursiop.com
Proposed Project Title: High-performance nanotechnology-based imaging coil for ophthalmological diagnostic applications
Estimated funds requested: \$ 400,000
Collaborator: Dr. David Bardenstein, Professor of Ophthalmology, Case Western Reserve University School of Medicine, Cleveland, Ohio

A project summary is attached on the next page.

Please let me know if further information is needed.

Yours sincerely,



Raju Viswanathan, Ph.D.
Chief Technology Officer
Tursiop Technologies, LLC

Tursiop Technologies, LLC

Project Summary:

High-performance nanotechnology-based imaging coil for ophthalmological diagnostic applications

This project seeks to develop a high-performance MRI ophthalmological imaging coil using Tursiop's proprietary nanomaterial technology, as a highly effective instrument for enhanced image-based MRI diagnosis of disorders of the eye and surgical planning applications in this connection.

Magnetic Resonance Imaging (MRI) is the imaging modality of choice in many medical diagnostic applications, particularly in the case of soft tissue imaging where an excellent range of contrast is possible with this modality. In the case of ophthalmology, while optics-based imaging methodologies can offer high resolution data within a limited field of view close to the surface, MRI is the only modality that permits a wide ranging field of view of the entire deep structure of the eye.

Currently, ophthalmological applications of MRI are limited by the insufficient availability of high performance MR imaging coils. High resolution eye imaging needs to be fast since motion artifacts can be an issue; this is only possible with high Signal-to-Noise Ratio performance of the imaging coil. Areas that would especially benefit include the diagnosis of benign and malignant tumors, inflammatory disease, infections, vascular conditions in the orbit and especially pediatric conditions where a shorter acquisition time means less sedation/anesthesia for children. Other applications include CNS vascular conditions in adults, neuro-ophthalmic visualization of the cranial and intraorbital nerves and intracranial lesion detection, assessment of glaucomatous damage, and functional MRI (fMRI) evaluation of retinal function and ocular physiology, where functional evaluations such as blood oxygenation and diffusion imaging can provide vital input. In these latter applications, high resolution imaging is critical and very relevant in the context of an aging population. Furthermore, the increasing awareness of radiation risks associated with CT will lead to greater emphasis on MRI as a preferred imaging modality.

With its demonstrated imaging advances based on nanomaterials, Tursiop can provide a significant boost to the development of MR imaging applications in ophthalmology with its high performance imaging coils that can yield images with significantly enhanced Signal-to-Noise Ratio (SNR) over that available with conventional methods.

The primary endpoint of the project is a high performance ophthalmological imaging coil at 1.5T that can offer very good SNR performance for optimized eye imaging well beyond that possible with conventional commercial coils available today. Both single channel and multi-channel coils will be developed as part of this study and carefully evaluated to arrive at an optimized design with substantial clinical utility. While the goal of this project is to arrive at a fully functional high-performance prototype imaging coil, it is expected to directly lead to a commercial version soon thereafter.

Ohio Third Frontier Medical Imaging Program

Letter of Intent The Ohio State University

Lead Applicant: The Ohio State University Office of Sponsored Programs
1960 Kenny Rd.
Columbus, OH 43210

Proposal Title: **New Molecular Imaging Agents**

Budget Request (Estimated):

Capital:	\$ 300,000
<u>Operating:</u>	<u>\$ 700,000</u>
TOTAL:	\$1,000,000

Collaborators: Battelle Health & Life Sciences (Herb Bresler)

Contact: Michael Tweedle, PhD
The Ohio State University
Department of Radiology
Biomedical Research Tower, Rm 710
460 W. 12th Ave
Columbus, Ohio 43215

Phone: 614-247-4427
Fax: 614-247-5050
Email: michael.tweedle@osumc.edu

This proposed program is a collaboration between The Ohio State University and its Molecular Imaging Agent Laboratory with its associated environment and Battelle and Life Sciences along with additional partners to be named.

The program is building upon the substantial expertise that is evolving within The Ohio State University and Battelle Health and Life Sciences to accelerate commercialization of molecular imaging agents, the production and services and availability for local, national and global markets. Molecular imaging plays an increasing role in the noninvasive assessment of biological processes for characterization and assessment. Those technologies are further utilized in innovative concepts such as advancing toxicological evaluation noninvasively for quantifiable biomarker capable readouts of specific pathways. The partners will focus on significantly accelerating the commercial opportunities in a synergistic way that builds upon and synergizes with other Ohio Third Frontier investments. The program is anticipated to include additional partners focusing on leveraging Ohio's expertise and commercialization partners. It is anticipated that a capital request of \$300,000 and operating funds of \$700,000 will be requested with appropriate matching as stipulated in the RFP.



CODONICS

We bring the future into focus

17991 Englewood Drive
Middleburg Heights, Ohio 44130

**Letter of Intent
Ohio Third Frontier Medical Imaging Program
Fiscal Year 2010**

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

To Whom It Concerns:

This document constitutes our Letter of Intent (LOI).

Lead Applicant: Codonics, Inc.
17991 Englewood Drive
Middleburg Heights, OH 44130
440-243-1198

Contact Person: Timothy Jakubisin, Director of Operations
tjakubisin@codonics.com

Project Title: Medical Image and Video Management Device

Estimated Grant Funds to be requested: \$800,000

Known Collaborators: To be determined

Summary of Proposed Project:

Codonics proposes the development of medical devices for image and video management. The system will display, capture, store and distribute medical images, reports, live camera feeds and recorded videos from surgical procedures over existing data networks. The scope of the project is to develop and market a digital image and video capture device for use in operating rooms and a network server for storing and distributing the data.

Respectfully submitted,

Timothy E. Jakubisin
Director of Operations
Codonics, Inc.

Ohio Third Frontier Medical Imaging Program

Letter of Intent The Ohio State University

Lead Applicant: The Ohio State University Office of Sponsored Programs
1960 Kenny Rd.
Columbus, OH 43210

Proposal Title: **Imaging Management Technologies**

Budget Request (Estimated):

Capital:	\$ 200,000
<u>Operating:</u>	<u>\$ 800,000</u>
TOTAL:	\$1,000,000

Collaborators: Rescentris, Columbus, OH (Adel Mikhail, PhD)
Imagepace, Cincinnati, OH

Contact: Aimee Nielsen-Link
The Ohio State University
Office of Sponsored Programs
1960 Kenny Road
Columbus, OH 43210

Phone: 614-292-3143
Fax: 614-292-9779
Email: Nielsen-link.1@osu.edu

This proposed program is a collaboration between The Ohio State University, Rescentris and Imagepace with additional partners to be named focusing on advancing biomedical imaging, management and assessment technologies.

This program brings together the unique expertise of the partners to accelerate the management of technologies to support biomedical research in imaging, basic science, translational science and clinical trials. Imaging technologies are data and computational intensive and require specialized resources for appropriate management and regulatory compliance. The program will bring the diverse skills together and will develop commercialization and services as integrated management of technology. The program will build upon existing Ohio resources and infrastructure that enable the integration of resources available in the state of Ohio. The anticipated request is for \$200,000 in capital funding and \$800,000 in operating funding.

Ohio Third Frontier Medical Imaging Program

Letter of Intent The Ohio State University

Lead Applicant: The Ohio State University Office of Sponsored Programs
1960 Kenny Rd.
Columbus, OH 43210

Proposal Title: **Multi-transmit Platform Technology for High and Ultra-high Field MR Imaging**

Budget Request (Estimated):

Capital:	\$ 400,000
<u>Operating:</u>	<u>\$ 600,000</u>
TOTAL:	\$1,000,000

Collaborators: Philips Healthcare Cleveland (Stefan Fischer)

Contact: Michael V. Knopp, MD, PhD
The Ohio State University
Department of Radiology
395 W. 12th Ave, Room 430
Columbus, OH 43210

Phone: 614-293-9998

Fax: 614-293-9275

Email: knopp.16@osu.edu

This proposed program is a collaboration between the Wright Center of Innovation in Biomedical Imaging and Philips Healthcare in Cleveland with additional partners to be named.

The concept of this program is to build upon the significant accomplishments and achievements obtained by the partnership development that led to the commercialization of the ultra-high field MR technology platform. The teams have evolved additional expertise as well as identified commercialization and market opportunities for using multi-transmit technology developments as a platform technology to further advance high and ultra-high field MR technology for the healthcare market. This program will focus on accelerating the technology platform to commercial products that can and will be further supplemented with add-on capabilities. The program will continue a close collaboration between the OSU and Philips-based teams. The anticipated request is for \$400,000 in capital funding and \$600,000 in operating funding with at least a 1:1 match.

Ohio Third Frontier Medical Imaging Program

Letter of Intent The Ohio State University

Lead Applicant: The Ohio State University Office of Sponsored Programs
1960 Kenny Rd.
Columbus, OH 43210

Proposal Title: **Noninvasive Radiofrequency-based Detection Technologies**

Budget Request (Estimated):

Capital:	\$ 250,000
<u>Operating:</u>	<u>\$ 750,000</u>
TOTAL:	\$1,000,000

Collaborators: RAPID Biomedical (Ulrike Haase)

Contact: Robert McKenney, PhD
The Ohio State University
Department of Radiology
395 W. 12th Ave, Room 428
Columbus, OH 43210

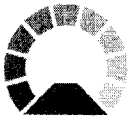
Phone: 614-293-7165

Fax: 614-293-9275

Email: mckenney.1@osu.edu

This proposed effort is a collaboration between The Ohio State University and RAPID Biomedical International to commercialize noninvasive imaging capabilities that are based upon advanced radiofrequency detection technologies.

Ohio is evolving an environment of increasingly advanced imaging technologies that further benefit from advanced capabilities that accelerate market penetration and potential for noninvasive imaging approaches. This effort is evolving based on identified commercialization opportunities that can be realized in Ohio by synergizing and accelerating independent development efforts. The anticipated request is \$250,000 for capital expenditures and \$750,000 for operating funds. It is further anticipated that additional partners within Ohio will join this program as committed end users have already been identified. This program has significant commercialization potential and the program's intent strongly matches the current development strategy.



Ohio Department of Development
Third Frontier Medical Imaging Program
State of Ohio

January 25, 2010

Dear Sirs,

AllTech Medical Systems America, Inc., in conjunction with partner companies and institutions detailed below, intends to submit a proposal in response to the 2010 Ohio Third Frontier Medical Imaging Program.

Project Title: Development of Physiological Gating Accessory for Clinical MRI System

Estimated Grant Funds Requested:
Requested state funding = \$1,000,000

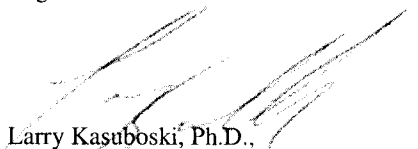
Lead Applicant:
AllTech Medical Systems America, Inc.
6551 Cochran Road
Solon, Ohio 44139
Phone: (440) 424-2240
FAX: (440) 424-2255
Contact Person: Larry Kasuboski, Ph.D.
Email: Larry.Kasuboski@AllTechMedUSA.com

Known Collaborators:

m2m Imaging
190 Alpha Park Drive
Highland Heights, Ohio 44143
Phone: (440) 684-9690
Contact Person: C. Richard Hullihen, CEO
Email: rhullihen@m2mimaging.com

A one page description of the partner roles and scope of development as well as the commercial opportunity is attached below.

Regards,



Larry Kasuboski, Ph.D.,
AllTech Medical Systems America, Inc.



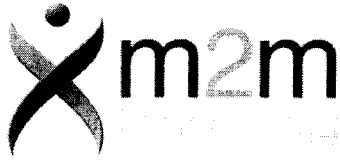
Summary of Development of Physiological Gating Accessory for Clinical MRI System:

MRI is commonly used as a non-invasive diagnostic imaging tool, because it provides a wealth of soft tissue and metabolic information with a minimum of collateral biological impact. Very high resolution images can be obtained of static structures providing excellent anatomical detail. Unfortunately, physiological motion can make some structures, such as the heart, difficult to image without the aid of a device to synchronize data acquisition with the periodic motion of those structures.

We propose to develop and commercialize a physiological gating accessory for our clinical imaging system, the EchoStar 1.5T and expand our software functionality to take advantage of this accessory. AllTech Medical Systems is based in Solon, Ohio and has already gained FDA approval to market their 1.5T whole-body clinical MRI system.

The company m2m Imaging based in Highland Heights, Ohio is a manufacturer of pre-clinical MRI detectors, and accessories. m2m already enjoys a strong presence in the pre-clinical market, with a well established customer base, strong sales, and distribution channels.

OTFMIP 10-939



m2m Imaging Corp.
190 Alpha Park
Highland Hts, OH
www.m2mimaging.com

January 25, 2010

Ohio Department of Development
Third Frontier Medical Imaging Program
State of Ohio

Dear Sir or Madam,

m2m Imaging Corp in conjunction with Case Western Reserve University Center for Imaging Research intends to submit a proposal in response to the 2010 Third Frontier Medical Imaging Program.

Project Title: Development of Cryogenic Preclinical MR RF Coil for High Performance Imaging in Proton and X-Nuclei Imaging

Estimated Grant funding requested: \$1,000,000.00

Lead Applicant:
m2m Imaging Corp.
190 Alpha Park
Highland Hts OH 44143
tel 440-684-9690
fax 440-684-9695
Contact Person: C. Richard Hullihen
Email rhullihen@m2mimaging.com

Known Collaborators:
Chris Flask, PhD, Director
Center for Imaging Research,
Case Western Reserve University
1100 Euclid Avenue
Cleveland, OH
216-844-4963

A one page description of the project is attached.

Sincerely,

C. Richard Hullihen, CEO



Project Title: Development of Cryogenic Preclinical MR RF Coil for High Performance Imaging in Proton and X-Nuclei Imaging

Background:

It is well documented in telecommunications, defense, and aerospace applications that cooling electronics associated with RF signal detection/reception dramatically improves performance. However, because of the technical difficulty of reducing this to practice in the bore of an MRI system's hostile environment, it is seldom done commercially. Building on our previous Federal grant's research, we propose to commercialize saleable products for the preclinical imaging research market. M2m is already a successful supplier to the world leading manufacturers of preclinical research imaging systems, those being Bruker, Varian, and Siemens.

Technology

The technologies required include materials science, vacuum and cryogenic packaging, and RF engineering. These are competencies that m2m has in house. m2m already markets a wide variety of conventional room temperature RF coils for research, and this would, extend our product portfolio. In addition, we already have a 2W 90K cryocooler up and running as result of a previous project.

Funding

m2m request \$1M in funding which it would match. This funding is predominantly for research labor and prototyping materials.

Collaborators

m2m already has a collaborative relationship with Dr/ Chris Flask at the the Case Center for Imaging Research. The ability to perform iterative imaging tests on real systems is critical to the development process. Of specific interest is the use of this technology to image other nuclei than protons, which form the basis for many cell labeling and tracking research projects. We would, extend our relationship to include this project.

Markets

We estimate the world market for this product and its derivatives to be on the order of \$100M. m2m is already in market, and growing revenue, in this market segment. We further believe that it leads to the development of clinical coils. We estimate that market to be in excess of \$500M.

OTFMIP 10-940

Integrated Ultrasound 2010

2010 Medical Imaging Program Letter of Intent

Lead Applicant's Name: Cleveland Clinic

Contact Person: Aaron Fleischman, Ph.D.

Address:

Department of Biomedical of Engineering

ND-20

Cleveland Clinic

Office: 216/445-3218

Fax: 216/444-9198

E-mail: fleisca@ccf.org

Proposed Project Title: Integrated Ultrasonic Transducer for Medical Imaging and Therapy

Estimated Grant funds to be requested: \$1,000,000

Known collaborators:

H-Cubed

NASA Glenn Research Center

Connecticut Reserve Technologies Inc.

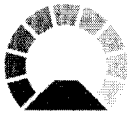
Case Western Reserve University

Cleveland State University

Summary of the proposed project:

Ultrasonic imaging is a major medical imaging modality. It is relatively inexpensive and does not use ionizing radiation for image generation. With ever increasing use of minimally invasive surgical techniques, catheter and probe-based soft tissue imaging has become increasingly important. High frequency ultrasound can provide images of structures with microscopic resolution as well as therapeutic focused ultrasonic ablation of targeted tissue. The practical transducer will be small enough to fit on the end of a catheter or probe, contain integrated electronics to allow simple implementations with a minimum of external connections, and be cheap enough to be a single use device.

This project, including Cleveland Clinic, NASA, Case Western Reserve University, Cleveland State University, and our industry and commercialization collaborators listed above, represents a group of leaders in ultrasonic transducers, sensor development, testing, and commercialization. Funds for this proposal will be used to support the development and commercialization of existing sensors and expand the design of imaging transducers and combination imaging and ablation transducers. The project's emphasis will be to identify clinically significant needs, create ultrasonic transducer solutions, show capability to economically manufacture the transducers, and demonstrate feasibility. This will create a leadership position in the state of Ohio for minimally invasive imaging and therapy.



AllTech Medical Systems America, Inc.

OTFMIP 10-941

Ohio Department of Development
Third Frontier Medical Imaging Program
State of Ohio

January 25, 2010

Dear Sirs,

AllTech Medical Systems America, Inc., in conjunction with partner companies and institutions detailed below, intends to submit a proposal in response to the 2010 Ohio Third Frontier Medical Imaging Program.

Project Title: Next Generation Spectrometer for Clinical MRI System

Estimated Grant Funds Requested:
Requested state funding = \$1,000,000

Lead Applicant:
AllTech Medical Systems America, Inc.
6551 Cochran Road
Solon, Ohio 44139
Phone: (440) 424-2240
FAX: (440) 424-2255
Contact Person: Larry Kasuboski, Ph.D.
Email: Larry.Kasuboski@AllTechMedUSA.com

Known Collaborators:

Case Western Reserve University
Biomedical Engineering and Physics Departments
10900 Euclid Avenue
Cleveland, Ohio 44106
Phone: (216) 368-4099
Contact Person: Robert W. Brown, PhD
Email: rwb@case.edu

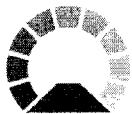
A one page description of the partner roles and scope of development as well as the commercial opportunity is attached below.

Regards,

A handwritten signature in black ink, appearing to read "Larry Kasuboski".

Larry Kasuboski, Ph.D.
AllTech Medical Systems America, Inc.

6551 Cochran Road
Solon, OH 44139
Telephone: +(440) 424-2240 Fax: +(440) 424-2255



Summary of Next Generation Spectrometer for Clinical MRI System:

AllTech Medical Systems America (AMSA), based in Solon, Ohio, currently offers a 16 channel 1.5T clinical MRI spectrometer which is approved for sale in China by China's State Food and Drug Association. As part of AMSA's ongoing product evolution, the data acquisition subsystem needs to be updated to take advantage of the technological evolution of semi-conductors while still maintaining the design subtleties that are required for MRI data acquisition. We propose a project to develop and commercialize the next generation of our data acquisition system.

The MRI biomedical engineering and physics groups at Case Western Reserve University have produced more than 100 publications on, respectively, leading-edge small animal imaging research and the physical principles of MRI, the latter especially related to electromagnetic design and advanced imaging concepts.

A significant number of concepts developed by the MRI Physics group have been employed on clinical scanners. Their understanding of the unique properties of the MRI signal and environment at all field strengths will provide the tools required to efficiently develop a cutting-edge MRI data acquisition system. With more than half of the graduates of the CWRU groups entering careers in industry and most of those remaining in Ohio, this collaboration provides new opportunities to retain these technical leaders in Northeast Ohio and support the vibrant interaction between industry and academia that currently exists.

Hansen, Andrew

From: jslindsey@roadrunner.com
Sent: Monday, January 25, 2010 1:59 PM
To: OTFMIP2010
Subject: 2010 OTFMIP LOI

Lead Applicant:

Atypigene Biomedical Research Institute 340 West State Street Athens, Ohio 45701
206-619-9077

Contact person: J. Suzanne Lindsey, PhD, President and Chief Scientific Officer email
address: jslindsey@roadrunner.com

Proposed Project title: Monoclonal antibody against an antigen specific to all solid
types of tumor cells coupled to ferromagnetic lignosite particles for MRI imaging and
detection of cancer

estimated grant funds to be requested: \$ 184,000

Collaborator: Ohio University Innovation Center

Summary of the proposed project:

Use of imaging techniques (such as ultrasonography, computed tomography, and magnetic
resonance imaging (MRI)) is an option for the diagnosis of solid cancers. However, these
techniques are not often used to make clinical decisions due to a lack of accuracy and
often a combination of the different methods is used to arrive to a diagnostic conclusion
(1,2). What is needed are tumor cell-specific antigens that can be unambiguously
identified as cancer upon imaging.

Mig-7, is apparently tumor cell-specific and not merely overexpressed compared to normal
cells. In addition targeting Mig-7 for imaging of cancer would be cost effective because
it is expressed by all types of solid cancers and melanomas analyzed to date (3,4). The
only normal cell type that expresses Mig-7 are fetal cytotrophoblast cells which behave
similarly to cancer cells (4).

Funding for this project will test Mig-7 monoclonal antibody linked to ferromagnetic
lignosite particles with MRI for detection of cancer in vivo using a nude mouse model.

Reference list:

1. Beets-Tan R.G. Beets G.L. Rectal cancer: review with emphasis on MR imaging. Radiology 2004;232 (2):335-46.
2. Pignone M. Saha S. Hoerger T. Mandelblatt J. Cost-effectiveness analyses of colorectal cancer screening: a systematic review for the U.S. Preventive Services Task Force. Ann Intern Med 2002;137(2):96-104.
3. Phillips T. M. and Lindsey J.S. (2005) Carcinoma Cell-specific Mig-7: A new potential marker for circulating and migrating cancer cells. Oncology Reports 13(1):37-44.
4. Crouch S., Spidel C.M. and Lindsey J.S. (2004) HGF and ligation of $\alpha\beta 5$ integrin induce a novel, cancer cell-specific gene expression required for cell scattering. Experimental Cell Research 292(2): 274-287
5. Petty, A.P. Garman, K.L. and Winn, V.D., Spidel, C.M. and Lindsey, J.S. (2007) Overexpression of carcinoma and embryonic cytotrophoblast cell-specific Mig-7 induces invasion and vessel-like structure formation. American Journal of Pathology 170(5) 1763-1780. A commentary accompanies this article.

Ohio Third Frontier Medical Imaging Program

2010 Request for Proposals

Application Information Page

Letter of Intent (LOI) Notification Number (Issued by ODOD)		LOI #: OTFMIP 10-_____	
This Application: <input type="checkbox"/> Does Not <input checked="" type="checkbox"/> Does include information considered a "trade secret" under Ohio Revised Code Section 1333.61 (D)			
Lead Applicant Name	<u>Teraphysics Corporation</u>		
Lead Applicant Address	<u>110 Alpha Park</u>		
	City: <u>Highland Heights</u>	Ohio County: <u>Cuyahoga</u>	
	State: <u>Ohio</u>	Zip Code: <u>44143</u>	
Project Title:	<u>Terahertz Source</u>		
State Funds:	OTFRDFS Wright\$ Total\$	Cost Share:	<u>\$1,000,000</u>
Is the Lead Applicant the lead in any other proposal submitted under this RFP?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If yes, provide the Other Project Title/LOI #:			

Deleted: Zip Code:

Michael Wieder

Manager, Strategic Relationships

Typed Name of Authorizing Agent

Title of Authorizing Agent

Michael Wieder

1/22/10

Signature

Date

For ODOD Use Only

Date Received

Proposal ID #

Ohio Third Frontier Medical Imaging Program

Lead Applicant Contact Information

Authorizing Agent	Name	<u>Michael Wieder</u>		
	Title	<u>Manager, Strategic Relationships</u>		
	Organization	<u>Teraphysics Corporation</u>		
	Address	<u>110 Alpha Park</u>		
	City, State, Zip	<u>Highland Heights, Ohio 44143</u>		
	Telephone	<u>440-573-0008</u>	Fax	<u>440-646-9987</u>
	E-Mail	<u>wieder@teraphysics.com</u>		

Project Director	Name	<u>Dr. Gerald Mearini</u>		
	Title	<u>Founder & Chief Technical Officer</u>		
	Organization	<u>Teraphysics Corporation</u>		
	Address	<u>110 alpha Park</u>		
	City, State, Zip	<u>Highland Heights, Ohio 44143</u>		
	Telephone	<u>440-573-0008</u>	Fax	<u>440-646-9987</u>
	E-Mail	<u>mearini@genvac.com</u>		

Fiscal Agent	Name	<u>Carole Ream</u>		
	Title	<u>Controller</u>		
	Organization	<u>Teraphysics Corporation</u>		
	Address	<u>110 Alpha Park</u>		
	City, State, Zip	<u>Highland Heights, Ohio 44143</u>		
	Telephone	<u>440-573-0008</u>	Fax	<u>440-646-9987</u>
	E-Mail	<u>ream@genvac.com</u>		

Grant Administrator	Name	<u>Carole Ream</u>		
	Title	<u>Controller</u>		
	Organization	<u>Teraphysics Corporation</u>		
	Address	<u>110 Alpha Park</u>		
	City, State, Zip	<u>Highland Heights, Ohio 44143</u>		
	Telephone	<u>440-573-0008</u>	Fax	<u>440-646-9987</u>
	E-Mail	<u>ream@teraphysics.com</u>		

Authorizing Agent – the individual authorized by the Lead Applicant to accept the terms and conditions of an award of Grant Funds.

Project Director – the individual authorized by the Lead Applicant to direct the Project for which the Grant Funds have been awarded.

Fiscal Agent – the individual authorized by the Lead Applicant to sign Grant-related financial documents, *e.g.*, Requests for Payment, Grant financial reports, *etc.*

Grant Administrator – the individual authorized by the Lead Applicant to oversee the day-to-day administration of the Grant Funds, including preparing progress reports, monitoring project progress, *etc.*

Note: The same individual may hold more than one of these positions.