MTAF Round 3
Notice of Intent Submissions
Sector: Precision Manufacturing

MTAF #	Project Title	Lead Institution	County	State	Amount ($)
3004	Laboratory facilities for Wound Care Products	Biovation LLC	Lincoln	ME	100,000.00
3031	Establish Robotic Systems Technology Center	Technological Innovations, LLC	York	ME	500,000.00

Form Data (May 02, 2010 at 09:33:36 PM)

1. Project Title. Character limitation: 80 including spaces.

Project Title	Laboratory facilities for Wound Care Products

2. Lead Institution

Name	Biovation LLC

Lead Organization Type: Choose One

Profit

Mailing Address 1	55 Industrial Park Road
Mailing Address 2	None given.
City	Boothbay
County	Lincoln
State	ME
ZIP	04537

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name	Kerem
Rep. Last Name	Durdag
Rep. Title	Chief Executive Officer
Rep. Institution	Biovation LLC
Rep. Telephone	207-632-2559
Rep. Email Address	kdurdag@biovation.com
Rep. Mailing Address 1	55
Rep. Mailing Address 2	Industrial Park Road
Rep. City	Boothbay
Rep. State	ME
Rep. ZIP	04537

4. Project Director: Scientific lead and/or project manager.

Dir. First Name	Ray
Dir. Last Name	Walsh
Dir. Title	Project Manager
Dir. Organization	Biovation LLC
Dir. Mailing Address 1	55 Industrial Park Road
Dir. Mailing Address 2	None given.
Dir. City	Boothbay
Dir. State	ME
Dir. ZIP	04537
Dir. Telephone	207-633-0616
Dir. Email Address	rrwalsh@biovation.com
Dir. Fax	207-633-0614

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators	None

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount ($)	100000

7. Technology Sector

Chose One Sector Precision Manufacturing

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Material and Health Sciences understanding are vital while Life Sciences are utilized in evaluation and testing.

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from **WITHELD BY MTI**

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.
Character limitation: 6,000 including spacing

Description Area

The proposed project is for the building of a laboratory facility in order to contact testing and product development for the commercialization of wound care products; inclusive of the infection control chemistry and the encapsulation of mentioned chemistry onto roll-good substrate (dressing). Chronic wounds include ulcers like diabetic, venous stasis and pressure ulcers and non-healing wounds resulting from trauma or burns. Every year about 100 million people are treated for chronic wounds. The increasing prevalence of chronic wounds is driving the advancement of wound management market where Biovation based on generated IP and customer interaction identified as its ﷺbeach-headﷺ market to create a sustainable and scalable revenue stream. Biovationﷺs expertise is in infection control chemistry laden silver dressings; silver ions are used for wound care because of their anti-microbial activity and their ability to prevent nosocomial infections. Silver incorporated dressings are particularly useful in treating burn wounds. Such silver infection control technology can be coupled with combination dressings. Combination dressings consist of an anti-microbial agent and a biological material as the carrier. Some examples of combination dressings are silver alginate dressing, silver collagen dressing, collagen hydrocolloid and collagen and foam dressings. These dressings can be used for all types of ulcers, surgical and traumatic wounds. The goal of the created lab facility is to have a controlled environment in which various chemistries can be compounded and formulated and physical testing of the efficacy of those formulations be carried out. To do so requires working surfaces, scales, mixers, coolers, incubators, titration equipment, spectrometer, Flame Atomic Absorption et. al for the creation and characterization of the wound infection control chemistry. This needs to be augmented by capabilities to conduct physical testing on the sample dressing (so as to determine skin adhesion, peel strength, tear strength parameters), such as tensile measurements, precision slitting/cutting, a microscope, accelerated ageing chambers et. al. The planned lab will have the capability to conduct detailed biological testing. International (ISO) and American Association of Textile Chemists & Colorists (AATCC) have established bacteria and fungi test methods to quantify the performance of antimicrobial actives on fibers and textiles. These protocols have been adopted and modified for medical and FDA testing. Generally, the bacteria that are found in infected wounds are used, E. coli, Staff, Pseudomonas, etc., for wound dressings. Methods include AATCC 100 and 147 and ISO 20743, which is replacing JIS Z 2801. This testing can include multi-drug resistant strains like MRSA, VRE and C. difficile. Tests which serve as the precursor database for the initiation of testing database that will be utilized for FDA 510(k) medical device filing for roll-goods products will be carried out. All of these methods involve placing live bacteria on a treated sample with an untreated ﷺcontrolﷺ and allowing exposure in a nutrient broth for 24-hours. A neutralizer is then applied to deactivate the antimicrobial while not harming any live bacteria. These bacteria are harvested, placed in a

MTAF 3004

growth media, diluted for counting into Petri plates and incubated for 48-hrs. Visual counting of the colonies is then conducted and compared with the starting point and the performance of the control. The data are used to measure the performance of the antimicrobial under conditions that mimic real life conditions. The creation of the lab is a directly tied to the customer dialogue that Biovation is engaged with leading to joint development agreements allowing internal research defining the distinct parameters of product specification, commercialization channels and revenue stream details. Biovation's expertise has been recognized and it is managing expectations to position itself adequately to provide technology and product on a determined milestone and timeline basis to significant and targeted customers. In order to facilitate such activity, in a prudent and judicious manner, it will be implementing the construction of mentioned lab facilities at its manufacturing plant; the lab will occupy a project 1000 sq ft area in the company's 20,000 sq ft facility. Biovation is a founding member of the Bioplastics Council of Maine which is tasked with commercializing polylactic acid (PLA) polymer (100% organic and biodegradable polymer) via Maine harvested potatoes. The Bioplastics Council is a MTI funded cluster and is currently in the process of defining specific performance characteristics for the PLA, which will be produced in a pilot facility in close cooperation with the University of Maine. It is possible that the PLA can be utilized by Biovation in it is wound dressing roll-goods products tested in lab facilities such as the one Biovation is planning. It is with the targeted approach above that positive economic impact for the state of Maine will be reaped. In the area of precision medical device manufacturing, there are "outposts" of activity in Maine and the creation of the lab will be contributive to this growing medical device ecosystem. Also, we aim to staff the laboratory, initially with one new hire (laboratory manager) and as a function of business opportunities with more personnel as appropriate. The lab will be focal point of plans to provide roll-goods products to the targeted sectors of wound care management. Our ability to carve a high-value, margin-rich product in "market pull" areas is predicated on the test and verification data we generate. Sub-contracting on a continual basis to others would be cost-prohibitive and not enable us to have prudent control of the process; implementing the lab facilities provides inherent flexibility and nimbleness solely guided by end customer needs.

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

Upon MTI's receipt of the electronically submitted Notice of Intent, you will receive an automatically generated acknowledgement of the receipt. An e-mail acknowledgment will also be sent to the Project Director.

In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Submission Metadata

IP	127.0.0.1
Browser	Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; Trident/4.0; SLCC2; .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0; MALC)

Form Data (May 04, 2010 at 12:55:45 PM)

1. Project Title. Character limitation: 80 including spaces.

Project Title	Establish Robotic Systems Technology Center

2. Lead Institution

Name	Technological Innovations, LLC

Lead Organization Type: Choose One

Profit

Mailing Address 1	PO Box 1837
Mailing Address 2	None given.
City	Sanford
County	York
State	ME
ZIP	04073

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name	Mike
Rep. Last Name	Burke
Rep. Title	Vice President
Rep. Institution	Technological Innovations, LLC
Rep. Telephone	561-758-2345
Rep. Email Address	mikeburke@technova.me
Rep. Mailing Address 1	PO Box 1837
Rep. Mailing Address 2	None given.
Rep. City	Sanford
Rep. State	ME
Rep. ZIP	04073

4. Project Director: Scientific lead and/or project manager.

Dir. First Name	Daniel
Dir. Last Name	Johnson
Dir. Title	President/Chief Engineer
Dir. Organization	Technological Innovations, LLC
Dir. Mailing Address 1	PO Box 1837
Dir. Mailing Address 2	None given.
Dir. City	Sanford
Dir. State	ME
Dir. ZIP	04073
Dir. Telephone	207-608-2088
Dir. Email Address	danjohnson@technova.me
Dir. Fax	207-324-8677

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators	1.Dr. Barry Goodell, Dr. Xinfeng Xie, WURC, University of Maine 2. Dr. Mohsen Shahinpoor, DR. David Dvorak, Mechanical Engineering, University of Maine

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount ($)	500000

7. Technology Sector

Chose One Sector Precision Manufacturing

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Robotic Engineering, Advance Composites

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

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11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.
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Description Area

Technological Innovations, LLC (TI) is a technology transfer organization. TI has been formed to identify and assess cutting-edge technologies and collaboratively develop the technology through the proof of concept stage to prototype analysis and into business planning for profitable commercialization in the State of Maine. TI specializes in the creation and conversion of innovative technologies to commercial success. Description of Project/Use of Awards: TI will use Maine Technology Asset funds to establish a technology center to develop cost competitive manufacturing techniques using robotics by purchasing and renovating the facility at 11 Presidential Lane in Sanford, Maine and installing three (3) robotic manufacturing systems. This property is a converted hangar at the Sanford Airport, industrially zoned, and suitable for manufacturing. TI has the ﷺhands onﷺ expertise in robotic engineering/manufacturing that allows for the development of a competitive manufacturing cell. This capability allows for a ﷺstart-upﷺ product or company to have a cost competitive opportunity to establish manufacturing jobs in the State of Maine. Approximately half of the building will be converted to the robotic pilot manufacturing center to provide ﷺhands onﷺ manufacturability assessment of the technological innovations that the company is currently assessing as well as future undertakings. The other half of the building will be leased to DM Technologies, the conformal coated tantalum capacitor manufacturing company. The Maine Technology Asset Fund award will also be utilized to acquire a compaction press, a high-temperature, vacuum and controlled furnace and other ancillary capital equipment that will be housed in the Presidential Lane. This equipment will support TIﷺs initial collaboration project with the University of Maine on mesoporous carbon nano-structure (TI-MCN) energy storage devices which includes technology assessment, prototype development and best practice manufacturing techniques. TI is also collaborating with the University of Maine for the newly developed fuel cell project. TI has been asked to develop a competitive manufacturing process. Scientific Rationale for the Collaboration Projects: The MCN process has been developed by Drs. Goodell and Xie at the Wood Utilization Research Center at the University of Maine. The carbonized wood material shows promise in that it has a greater theoretical energy storage capacity than carbon nanotubes. The scientific rationale for using wood is the unique type of highly-ordered mesoporous carbon (HOMC) structure due to the unique nano-structural alignment of the long cellular material (cellulose) contained within wood cell walls. This open pore structure, versus more closed pores found in a nano-tube structure, will allow better impregnation of an electrolyte with an outcome of increased capacitance. This premise has been supported by research done by the international scientific community. The University of Maine has determined that there is enough scientific evidence for it to advance its provisional patent for the unique fuel cell developed by Drs. Shahinpoor and Dvorak to patent status. Dr. Shahinpoor has requested that TI develop the manufacturing

process that will support commercialization of the fuel cell. Economic Impact: TI's vision is a technology transfer business that assesses and develops technologies that generate patents, generate intellectual property resulting in licensing opportunities, and provides the basis for product development and advanced manufacturing techniques that lead to the creation of manufacturing jobs in Maine. TI's vision for the technology center is to establish robotic manufacturing systems that can be adapted to specific technologies such as the TIMCN project and the fuel cell project leading to successful commercialization. This robotics platform has the potential to be expanded to businesses throughout the State leading to economical manufacturing and the creation/retainment of jobs in Maine. Additionally, the TIMCN energy storage device is derived from wood. Maine is a major source of wood and the TIMCN product would contribute to Maine's timber and logging industry. Organization Participation: The TI team members are seasoned engineering and manufacturing professionals who have the world-class know how to bring the TIMCN project, the fuel cell project and other projects to commercial status through the employment of robotic manufacturing systems. TI management has assembled a group of professional independent contractors and organizations to draw from for participation in the development of the projects that TI plans to commercialize. Included in this group are: • Maine PTAC • Ernie Gray • Maine Manufacturing Extension Partnership (MEP) • Rosemary Presnar • Small Business Association (SBA) o Paul Collins of Key Bank o James Maxwell of New England Business Finance, • BGS group of the Maine Manufacturing Association (MMA) • Lisa Martin • Small Business Development Corporation • Gordon Platt • Ohman Business Services - Christine Ohmann • The University of Maine will be the prime collaborator with Technological Innovations for these initial projects: o Wood Utilization Research Center • UMaine Dr. Barry Goodell Dr. Xinfeng Xie o Mechanical Engineering Department • UMaine Dr. Mohsen Shahinpoor Dr. David Dvorak Dr. Vince Caccese TI anticipates adding other entities such as the University of Southern Maine, The Advanced Training Center at Brunswick, and the York County Community College to its resource group.

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Submission Metadata

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