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January 13, 2014

The Honorable Terry E. Branstad
Governor's Office
State Capitol Building
Des Moines IA 50319

Michael E. Marshall
Secretary of the Senate
State Capitol Building
Des Moines IA 50319

Carmine Boal
Chief Clerk of the House
State Capitol Building
Des Moines IA 50319

Debi Durham, Director
Iowa Economic Development Authority
200 East Grand Avenue
Des Moines IA 50309

Holly Lyons, Division Director
Legislative Services Agency
State Capitol Building
Des Moines IA 50319

Re: Economic Development Funds

Pursuant to Iowa Code and Iowa Acts listed below, the enclosed annual report includes information from the University of Iowa, Iowa State University, and the University of Northern Iowa.

2013 Iowa Acts, Chapter 141.30 (HF 604)	Progress of the Regents Institutions on Activities, Projects and Programs from FY 2014 Iowa Skilled Worker and Job Creation Fund
2012 Iowa Acts Chapter 1136.17 (HF 2337)	Progress of the Regents Institutions on Activities, Projects and Programs from FY 2013 Regents Innovation Fund
Iowa Code §15G.111 (repealed effective 6/30/2012)	Progress of the Regents Institutions on Activities, Projects and Programs from FY 2012 Grow Iowa Values Fund (includes allocations to private universities)

If there are any questions concerning this report, please do not hesitate to contact us.

Sincerely,

Robert Donley

H:\BF\Legislative\2014 session\responses\Economic Development Report\GA_econdevreport011314innov.doc
Enclosures
cc: Kent Ohms
Legislative Liaisons
Legislative Log

University of Iowa - December 31, 2013
Innovation Fund Appropriations

		FY 2013 Innovation Fund Appropriation	$1,050,000
1	Proof of Concept Funding	$389,653	
2	Entrepreneurial Education and Business Support Programs	$195,422	
3	Infrastructure Investment for Growing Startup Companies	$464,925	

University of Iowa	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
1	**Proof of Concept Funding**	FY 2013 State Appropriations (INNOV)	$389,653	$389,653
		FY 2013 Matching Funds (Other)	$389,653	$389,653
Description of Project	Proof of concept funding will be used to move highly promising, but very early stage, technology from faculty inventors that has commercialization and licensing potential.			
Anticipated End Results	Exciting discoveries from University research are, by definition, very early stage and require sustainable sources of funding to take nascent intellectual property to the point where private investment is viable. The funds are used to support the development of innovations with commercial potential, with the result that more UI technology reaches the marketplace as the foundation for new Iowa companies and/or the growth of existing Iowa companies. The funding is intended to support a wide-range of stages in technology development, from initial concept (prior to intellectual property disclosure), to proof of concept, to licensing and commercialization. Innovation Fund fills this critical void and has enabled UI to take advantage of our growing technology pipeline and nurture companies with a desired outcome to create new companies and jobs for the State of Iowa.			
Results achieved to Date/Plans	Seed funding was provided to expand the commercialization of UI technologies. All projects are intended to have clear commercial potential for the State of Iowa, such as growing existing Iowa companies, creating new Iowa companies, or licensing to existing Iowa companies. Awards were made in three rounds between October and November 2013. Pre-proposals were submitted and reviewed by UIRF staff and student teams for patent and commercial potential. This included financial and market analysis. PIs were mentored through the final project proposal process, and each proposal was reviewed by a committee of University and business members. $343,000 of awarded funding was expended during FY13. The remaining funds were used in FY14 as individual projects were completed. In November 2013, funding was awarded to 10 faculty projects selected from 18 proposals. Of the 10 awards, 5 investigators went on to form new ventures within the year. Products being developed range from software to medical devices and vaccines. Several are “platform” technologies that plan on developing multiple related products and services. Three of the ventures received $100,000 royalty-based loans from the Iowa State Demonstration Fund using UIRF awards as matching funds. Other ventures will apply as appropriate. Commercialization projects have stated milestones that are monitored by the UIRF. The goal is to prepare each project for additional investment through SBIRs, grants and private equity.			

University of Iowa	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
2	**Entrepreneurial Education and Business Support Programs**	FY 2013 State Appropriations (INNOV)	$195,422	$195,422
		FY 2013 Matching Funds (Other)	$195,422	$195,422
Description of Project	To support comprehensive student and faculty entrepreneurial education and business programs to help create and sustain University startup companies.			
Anticipated End Results	The John Pappajohn Entrepreneurial Center (JPEC) offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development include providing business consulting services to small companies located across Iowa through its student field study program; hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation; supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory; and delivering entrepreneurial education through academic courses across campus and online, workshops/seminars, and high school teacher training/curriculum.			

Results achieved to Date/Plans	In order to support and encourage student, faculty and staff entrepreneurs, JPEC and the Iowa Centers for Enterprise (ICE) sponsored a series of Elevator Pitch Competitions in the fall of 2012. These were launched with a workshop, supported through several group mentoring sessions as well as one-on-one advising and culminated with two competitions that awarded a total of $44,000 in startup seed grants ($27,000 to 14 companies from this funding and $17,000 in matching private support to an additional 9 student companies). In addition, $3,500 in seed funding was awarded to 4 student businesses in the Bedell Entrepreneurship Learning Laboratory. $750 in seed funding was awarded to the best idea identified at the Iowa City Startup Weekend and $1,000 to the best UI business at the Des Moines Business Fair. In the spring of 2013, JPEC continued the development of the entrepreneurs who participated in pervious Elevator Pitch Competitions through mentoring as well as by sponsoring Business Model and Business Plan Competitions. $65,000 was awarded through the Business Model Competition to 16 companies. Seed awards totaling $10,500 were awarded to 6 Bedell Lab students during their End-of-Year/ Business Fair Competition and an $1,950 extra in seed grants awarded to startups who showed great progress in the development of their businesses throughout the year. In addition, $5,000 was awarded to the top 3 Iowa City Pitch and Grow Competition winners. Lastly, $6,800 was used to recognize and award faculty, staff, and students during the UI's inaugural Hawkeye Innovation Summit, and $10,000 was awarded to UI startups to fund UI student interns.			
University of Iowa	**Project**	**List of all FY 2013 Revenue Sources**	**Revenue Dollars for FY 2013**	**Amount of FY 2013 State Appropriations Expended as of 12/31/2013**
3	**Infrastructure Investment for Growing Startup Companies**	FY 2013 State Appropriations (INNOV)	$464,925	$464,925
		FY 2013 Matching Funds (Other)	$464,925	$464,925
Description of Project	To provide the incremental infrastructure investment needed to support growing numbers of University startup and technology-based companies, including space and technical assistance.			
Anticipated End Results	These funds were used to continue to invest in technology development infrastructure thus strengthening and accelerating commercialization and the support of critical economic development support functions associated with the UI Research Park, BioVentures Center, Technology Innovation Center and ICE.			
Results achieved to Date/Plans	The Regents Innovation Fund has been used to assist several new University startup and technology-based companies by assisting them in the technology development infrastructure to strengthen and accelerate commercialization. The funding has been used to obtain FDA consulting for several faculty projects, legal fees for incorporation, website launch assistance, and to acquire market analysis reports to enhance business planning. New companies that have benefited from this support include: Emmyon, Memcine, Iowa Approach, and NanoMedTrix. Funding was used to purchase laboratory equipment, complete installation of a 3D prototyping printer (partners with the College of Engineering and College of Liberal Arts) and to support start-u companies in laboratory and office build-out and business development activities. In addition, the UI economic development team has met with several Iowa based service providers to provide one-on-one counseling and workshops to our new and existing companies and assist them with HR issues, legal advice, accounting and R&D tax service and marketing support. A Proof of Concept competition for existing incubator tenants occurred April 2013. The incubator companies submitted their proof of concept ideas to a judging panel. They were judged on their proof of concept, business plan, marketing plan, etc. A total of $100,000 in awards was given to seven incubator companies (Memcine, ASL, Exemplar, KemPharm, NanoMedTrix, Bio::Neos and Higher Learning Technologies) to further support their business ideas, or to use as leverage for other funding sources, prototyping and new product development.			

University of Iowa - as of December 31, 2013
ISWJCF Fund Appropriations

		FY 2014 ISWJCF Fund Appropriation	**$1,050,000**
1	Proof of Concept Funding	$325,000	
2	Entrepreneurial Education and Business Support Programs	$103,500	
3	Infrastructure Investment for Growing Startup Companies	$621,500	

University of Iowa	**Project**	**List of all FY 2014 Revenue Sources**	**Revenue Dollars for FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
1	**Proof of Concept Funding**	FY 2014 State Appropriations (ISWJCF)	$325,000	$5,084
		FY 2014 Matching Funds (Other)	$325,000	$199,810
Description of Project	Proof of concept funding will be used to move highly promising, but very early stage, technology from faculty inventors that has commercialization and licensing potential.			
Anticipated End Results	Exciting discoveries from University research are, by definition, very early stage and require sustainable sources of funding to take nascent intellectual property to the point where private investment is viable. The funds are used to support the development of innovations with commercial potential, with the result that more UI technology reaches the marketplace as the foundation for new Iowa companies and/or the growth of existing Iowa companies. The funding is intended to support a wide-range of stages in technology development, from initial concept (prior to intellectual property disclosure), to proof of concept, to licensing and commercialization. Innovation Funds fills this critical void and has enabled UI to take advantage of our growing technology pipeline, nurture companies with desired outcome to create new companies and jobs for the State of Iowa.			
Results achieved to Date/Plans	The Iowa Centers for Enterprise (ICE) provided seed funding designed to expand the commercialization of UI technologies. The funding is intended to develop innovations with commercial potential and support a wide range of technology stages from initial concept, to proof of concept, to licensing and commercialization. All projects are intended to have a clear commercial potential for the state of Iowa, such as growth in Iowa companies, creation of a new Iowa company, or licensing to an existing Iowa company. Awards were made in December 2013 (18 applications, 10 of which were funded). Pre-proposals were submitted and reviewed by UIRF staff and student teams for the patent and commercial potential. This included financial and market analysis. PIs were mentored through the final project proposal process, and each proposal was reviewed by a committee of university and business members. Commercialization projects have stated milestones that are monitored by the UIRF. The goal is to prepare each project for additional investment through SBIRs, grants and private equity. Projects were awarded. The majority of the awarded projects begin after January 1, 2014.			

University of Iowa	**Project**	**List of all FY 2014 Revenue Sources**	**Revenue Dollars for FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
2	**Entrepreneurial Education and Business Support Programs**	FY 2014 State Appropriations (ISWJCF)	$103,500	$5,000
		FY 2014 Matching Funds (Other)	$103,500	$8,633
Description of Project	To support comprehensive student and faculty entrepreneurial education and business programs to help create and sustain University startup companies.			
Anticipated End Results	The John Pappajohn Entrepreneurial Center (JPEC) offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development include providing business consulting services to small companies located across Iowa through its student field study program; hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation; supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory; and delivering entrepreneurial education through academic courses across campus and online, workshops/seminars, and high school teacher training/curriculum.			
Results achieved to Date/Plans	In order to support and encourage student, faculty and staff entrepreneurs, JPEC and ICE sponsored a series of Elevator Pitch Competitions in the fall of 2013. These were launched with a workshop, supported through several group mentoring sessions as well as one-on-one advising and culminated with two competitions that awarded a total of $50,000 in startup seed grants ($30,000 to 17 companies from this funding and $20,000 in matching private support to an additional 11 student companies). In addition, $3,500 in seed funding was awarded to 5 student businesses in the Bedell Entrepreneurship Learning Laboratory. $5,000 was used for sponsorship of the Innovation Expo to showcase UI startups and have them present for outside funding. These awards will be allocated in Spring 2014. In the spring of 2014, JPEC will continue the development of the entrepreneurs who participated in the fall Elevator Pitch Competitions through mentoring as well as by sponsoring Business Model and Business Plan Competitions, supplementing funding for a regional business plan competition and additional seed awards will be available for Bedell Lab students.			

University of Iowa	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2014	Amount of FY 2014 State Appropriations Expended as of 12/31/2012
3	**Infrastructure Investment for Growing Startup Companies**	FY 2014 State Appropriations (ISWJCF)	$621,500	$75,508
		FY 2014 Matching Funds (Other)	$621,500	$75,000
Description of Project	To support incremental infrastructure investment needed to support growing numbers of University startup and technology-based companies, including space and technical assistance.			
Anticipated End Results	The UI will use these funds to continue to invest in technology development infrastructure to strengthen and accelerate commercialization and support critical economic development support functions associated with the UI Research Park, BioVentures Center, Technology Innovation Center and ICE. We will create an innovative, joint venture partnership between the UI, regional economic development leaders and the private sector to expand and develop a new non-laboratory based Incubation Center at the University of Iowa Research Park (UIRP).			
Results achieved to Date/Plans	Funding is also being used for program development and staffing for engagement centers to impact statewide economic development efforts. Funds will be used in support of several new University startup and technology-based companies by assisting them in technology development infrastructure to strengthen and accelerate commercialization (to obtain FDA consulting , legal fees for incorporation, website launch assistance, SBIR/STTR assistance and to acquire market analysis reports to enhance business planning). Future support will include the purchase of additional shared laboratory equipment to provide space and equipment for a culture tissue laboratory and support to start-ups for laboratory and office build-out and business development activities. In Spring 2014, the UI will begin offering workshops hosting several Iowa based service providers to provide one-on-one counseling to our new and existing companies to assist them with HR issues, legal advice, accounting and R&D tax service and marketing support.			

YEAR END FULL REPORT: JULY 2013
IOWA STATE UNIVERSITY GIVF PROGRAM

EXECUTIVE SUMMARY

GIVF/RIF Commercialization Program

The projects pair ISU faculty with Iowa companies to create or improve products or processes. Each project lasts two years. One year after the completion of the project (or three years after the start), the Iowa companies are surveyed for impact by the Center for Industrial Research and Service (CIRAS). These funds are a **critical source of gap funding**. They represent a unique resource that can be applied toward the success of Iowa companies. A summary of the projects funded to date is below, followed by the list of active projects. To date, 96 projects have been funded through the Commercialization Program. Eighty nine of these projects are complete and many show excellent progress in improving the competitiveness and profitability of the Iowa companies involved. Thirty startup companies have been assisted; including **18 new companies that were started in the first seven years as a direct result of the GIVF funding**. In total more than 55 Iowa companies have participated in the program.

Surveys are conducted by CIRAS one year after project completion (true impact takes a minimum of 5-10 years).

Project Dates	Survey Year	Companies Surveyed	Jobs Created or Retained	Total Sales Increase	Total Investment & Cost Savings	Average Impact per Company
FY06-FY07	FY08	9*	71	$9,100,000	$23,500,000	$3,600,000
FY07-08	FY09	9	18	$3,700,000	2,760,000	$720,000
FY08-09	FY10	8**	6	600,000	732,000	$166,500
FY09 – FY10+	FY11	7**	13	675,000	967,000	$234,571
FY10-FY11	FY12	6**	6	$1,750,000	$1,730,000	$580,000
FY11-FY12	FY13	12**	13	$2,470,000	$2,571,000	$420,083
FY12-FY13	FY14	Ongoing				

* All surveyed companies were start-up companies.
** Surveys were not completed for all projects (not everyone chooses to participate in the survey.)
+ The sales increase was primarily from 1 successful project, but the jobs impact was spread. Many companies indicated it was too early to tell the sales impact (this is a frequent comment through the years).

Year Project Completed	Number of Projects	Number of Publications & Presentations	Number of Invention Disclosures	Number of External Funding Applications	Number of Applications Awarded	External Funding Received*
FY14+	6	5	0	6	0†	$ 0
FY13	4	6	2	12	5	$ 795,000
FY12	11	50	4	12	6	$ 6,364,000
FY11	11	46	3	20	6	$ 940,000
FY10	14	99	6	47	13	$ 2,720,000
FY09	15	53	4	48	20	$ 3,500,000
FY07-08**	n/a	n/a	n/a	n/a	n/a	n/a

*Some information on award amounts was not included. **Data was not collected.
+ Partial results, projects are not complete.
† The majority of external funding applications were still pending at the time interim reports were submitted.

Proof of Concept Initiative

The GIVF/RIF funds have been incorporated into a Proof of Concept Initiative (POCI) http://www.industry.iastate.edu/POCI.html. The POCI is intended to build on the foundation started by the GIVF program, include additional funding sources such as i6, IPRT company assistance, Plant Sciences, etc, and position Iowa State to more rapidly propel technologies toward market opportunities. We will do this by emphasizing both the business opportunity and the technology in projects that are funded through the POCI. By doing this we will position young companies to be able to attract the next stage of funding from either the state, angel or VC sources and/or position technologies to be more attractive commercialization opportunities for existing companies.

There were an additional 16 projects funded under the POCI, using non-RIF funding sources. A grand-total of 112 projects have been funded through the POCI model from FY07 – FY14. Summary statistics for all POCI projects (RIF and all other funding sources) are as follows:

Year Project Completed	Number of Projects†	Number of Publications & Presentations	Number of Invention Disclosures	Number of External Funding Applications	Number of Applications Awarded	External Funding Received**
FY14+	11	8	0	9	1*	$160,000
FY13	5	10	6	16	6	$1,020,000
FY12	11	50	4	12	6	$ 6,364,000
FY11	11	46	3	20	6	$ 940,000
FY10	14	99	6	47	13	$ 2,720,000
FY09	15	53	4	48	20	$ 3,500,000
FY07-08**	n/a	n/a	n/a	n/a	n/a	n/a

†Includes all projects funded through the POCI.
+ Partial results, projects are not complete.
*The majority of external funding applications were still pending at the time interim reports were submitted.
**Some information on award amounts was not included.

Principal Investigator	FY13 RIF Projects (to finish May 31, 2014)	Award Amount
Eliot Winer	3D Visualization of Medical Data on Mobile Devices for Training, Diagnosis and Treatment (part II and Phase II)	$65,000
Anumantha Kanthasamy	Small Molecule Non-receptor Tyrosine Kinase Inhibitors as Novel Neuroprotective Agents (part I)	$52,000
Zhiyou Wen	Development andOptimization of Pilot-scale Revolving Algal Biofilm Photobioreactor (RABP) for Easy Biomass Harvest—Phase II: Process Optimization and Algal Strain Evaluation	$50,000
Byron Brehm - Stecher	The MLVAnalyzer: Enabling a New Gold Standard	$50,000
Eve Wurtele	Bioassay-guided Fractionation to Isolate, Analyze and Characterize Therapeutic Compounds from *H. gentianoides*	$50,000
Iver Anderson	Titanium Atomization Melt Delivery Tube Lifetime Assessment	$50,000

	FY14 RIF Projects (To finish May 31, 2015)	
George Kraus	Toxicological and Bioequivalence Analysis of Synthetic Procyanidin and Tannin Compounds	$50,000

Report Type: Interim

Title: Small Molecule Non-receptor Tyrosine Kinase Inhibitors as Novel Neuroprotective Agents

PI: Anumantha Kanthasamy
Co-PI: George Kraus

Company Partners (if applicable, company names only): PK Biosciences

Project Goal: We propose to develop an orally active neuroprotective drug for the treatment of Parkinson's disease in humans. The goals of this high impact exploratory study are to identify one or more novel RM108 derivatives that have lo-nanomolar potency, minimal off-target effects, metabolically stable and drug-like properties to initiate future advanced preclinical studies.

Publications/presentations based on project: None.

Invention disclosures: None.

External funding applied for (indicate received/denied/pending):
An NIH R21 application will be resubmitted in Spring 2014.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

We had proposed to design and synthesize one or more novel RM108 derivatives and validate them as small molecule Fyn kinase inhibitors. We designed and synthesized 10 structural analogs of RM108 that would possess physical characteristics for oral dosing and to enter the CNS. These RM108 analogs contain isosteric and other modifications that are important for Fyn kinase inhibition. These compounds expect to have drug- like properties with minimal t structural liabilities. In vitro kinase screening by Invitrogen's Z-lyte assay against 5 closely related kinases revealed that two new analogs selectively inhibited Fyn kinase by >70%. We also tested the neuroprotective efficacy of CL100 (15-45mg/kg, sub cutaneous, daily) in a sub chronic MPTP- treatment animal model of Parkinson's disease. Results from this animal study revealed that RM analog CL100 protected against MPTP-induced motor deficits, striatal dopamine loss and nigral TH neuronal loss by more than 50%. For bioavailability studies, animals were injected with RM108 analog (15mg/kg, IV and SC) and then brain and plasma levels were measured at 1hr and 24 hr by LC-MS/MS. Results from this study revealed that levels of RM108 analog was 5900-7000ng/ml in plasma and 33-78ng/g in the brain within 1hr of intravenous administration. Similarly, RM108 analog levels were 3200-8300 ng/ml in plasma and detectable levels in the brain within 1hr of SC administration. Subsequent to the report submitted in July 2013, we had designed and screened additional 10 structural analogs of RM108 as small molecule Fyn kinase inhibitors. The new analogs were not as potent as RM108 in inhibiting Fyn kinase in Z-lyte screening assays. One of them, RM121, showed an IC_{50} 4.5μM for Fyn kinase compared 0.35 μM for RM108. Subsequently, we performed pharmacokinetic studies and bioavailability of RM108. Pharmacokinetic study revealed a terminal plasma mean elimination half-life ($T_{1/2}$) of 1.97 h and brain levels 24.5 ± 4.5ng/g at 30 min following oral administration of RM108 (15mg/kg) to mice. These data suggest that the RM108 analog selectively inhibited the therapeutic target Fyn kinase, was bioavailable in the brain, and was neuroprotective in animal models of PD. The data obtained in this study will help us build strong case of resubmission of our NIH R21 grant to further expand our CNS drug discovery project. We would like to thank Proof of Concept Initiative (POCI) of RIF at Iowa State for their kind support.

Report Type: Interim

Title: Development and Optimization of a Pilot-Scale Revolving Algal Biofilm Photobioreactor

PI: Zhiyou Wen

Company Partners (if applicable, company names only): Gross Renewables

Project Goal:

To develop a novel attached algal culture system (Revolving Algal Biofilm Photobioreactor, RABP) for facilitating algal biomass harvest during algal biofuel production process.

Publications/presentations based on project:

Gross M., Henry W., Michael C., Wen Z. (2013). Development of a Rotating Algal Biofilm Growth System for Attached Microalgae Growth with In-situ Biomass Harvest. Bioresource Technology. 150: 195-201.
Gross M., Wen Z. (2013). Development and optimization of algal cultivation systems. Iowa State University Digital Repository.
Gross M., Wen Z., (2013). Development of a Biofilm Based Algal Cultivation System to Facilitate High Biomass Productivity and Low Harvest Costs. Poster presentation: 7th Annual Algae Biomass Summit.; Orlando, FL. September 30-October 3. 2013.
Gross M., Wen Z. (2013). Development of a Biofilm Based Algal Cultivation System to Facilitate High Biomass Productivity and Low Harvest Costs. Oral presentation at: AIChE Annual Meeting.; San Francisco, CA. November 4-8. 2013.
Gross M, Wen Z. (2013). Development of a novel rotating biofilm based algal culture system for enhanced cell growth and biomass harvest. In: 3rd International Conference on Algal Biomass, Biofuels and Bioproducts, Toronto, Canada. June 16-19, 2013.
Wen Z. (2013). A Novel Algal Biofilm Photobioreactor for Easy Biomass Harvest. In: International Low-Carbon Forum of Regional Development, Shenzhen, China. April 20-22, 2013.
Wen Z. (2013). Development of a Novel Revolving Algal Biofilm Photobioreactor (RABP) for Easy Biomass Harvest. In: National Algae Association Commercial Farming Workshop, Woodlands, TX. April 11-12, 2013.

Invention disclosures:

A Revolving Algal Biofilm Photobioreactor (RABP) for Easy Biomass Harvest, Submitted to ISU Research Foundation on 7/10/2012 (ISURF# 04050), Reassigned the right to the company on November, 2012. Filed by the company to US Patent and Trademark Office on 3/14/2013 (US patent application # 61/783,737)

External funding applied for (indicate received/denied/pending):

Development of a novel revolving algal biofilm photobioreactor (RABP) for easy biomass harvest. USDA-SBIR program, $100,000. Gross M (PI). 06/2013 - 12/2013. (Wen served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $33,333) (Denied)

Development of a Novel Revolving Algal Biofilm Photobioreactor (RABP) for Easy Biomass Harvest. NSF-SBIR program. $150,000. Gross M (PI). 07/2013 - 12/2013. (Wen served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $50,000) (Denied)

Production of Algae Biomass Using an Attached Growth System and Thermochemical Processing of Whole Algal Biomass into Fuel Intermediates.DOE-Algal Biomass Yield program. $3,685,360. 01/2014-06/2016/ (Wen served as PI of the project). (Denied)

Mitigation of ammonia gas emission from animal houses using microalgae. EPA-SBIR program, $100,000. Gross M (PI). 06/2014 - 11/2014. (Wen served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $25,206) (Pending)

Mitigation of ammonia gas emission from animal houses using microalgae. USDA-SBIR program. $99,838. Gross M (PI). 06/2014 - 11/2014. (Dr. Hongwei Xin from Agricultural and Biosystems Engineering served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $26,466) (Pending)

Development of a Biofilm Based Algal Cultivation System for Generating Algal Biomass for Aquaculture Feed. USDA-SBIR program. $150,000. Gross M (PI). 06/2014 - 11/2014. (Dr. Kurt Rosentrater from Agricultural and Biosystems Engineering subcontractor of this SBIR proposal with a total budget of $18,957) (Pending)

Mitigation of ammonia gas emission from animal houses using microalgae. NSF-SBIR program. $150,000. Gross M (PI). 07/2014 - 12/2014. (Wen served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $50,000) (Denied)

Development of a Novel Revolving Algal Biofilm Photobioreactor (RABP) for Easy Biomass Harvest. NSF-SBIR program. $150,000. Gross M (PI). 07/2014 - 12/2014. (Wen served as a PI of the ISU subcontractor of this SBIR proposal with a total budget of $50,000) (Pending)

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

This project focuses on developing a novel biofilm based photobioreactor (Revolving Algal Biofilm Photobioreactor, RABP) which can be widely adapted by the algae industry for producing fuels and high value products. The RABP reactor can facilitate algal biomass harvest by reducing the harvest cost, which is a major bottleneck in the commercialization of algal biofuel production. We have performed a thorough lab-scale study optimize the RABP operational conditions, so the feasibility of the RABP system is proved. In the development of the pilot-scale RABP system, we constructed a green house in the BioCentury Research Farm, so the RABP system can be accommodated in the greenhouse for a year round operation. The greenhouse was a high premium facility with all the utilities and temperature control by a geothermal unit. Four RABP systems was then fabricated and assembled in the greenhouse. We have successfully run the RABP system for the algal culture in the green house for almost a year starting from January, 2014. As of December 2013 the pilot-scale RABP has been operating continuously (a few stops for mechanical repair) for a year straight. We also recorded daily averages for light intensity and temperature. We are in the process of making a statistical model that can produce a prediction equation that will allow us to predict the productivity of the system based on the average light intensity it receives. This will be valuable when analyzing this systems productivity in other places in the US that have different yearly light intensities. We have also looked at water use efficiency of the RABP system and considered different ways to improve it. Overall, the result shows that the pilot scale RABP system produced better results than the lab-scale RABP study due to the improvement of the light intensity.

Report Type: Interim

Title: Visualization of Medical Data on Mobile Devices for Training, Diagnosis and Treatment

PI: Eliot Winer

Company Partners (if applicable, company names only): Visual Medical Solutions, LLC

Project Goal: To research and commercialize volume rendering of medical data on a mobile device

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Publications/presentations based on project: Noon, C., Holub, J., and Winer, E., "Real-time volume rendering of digital medical images on an iOS device", Proceedings of the 2013 SPIE Medical Imaging Conference, Burlingame, CA, February 3-7 2013

Invention disclosures: ISURF Disclosure #4004 – licensed to Visual Medical Solutions, LLC.

External funding applied for (indicate received/denied/pending): None

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Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

An iOS application has been developed during the time of the project. This allows a user to load in a computed tomography (CT) or Magnetic Resonance Imaging (MRI) datasets and view them in interactive 3D. A user can fully manipulate the representation through rotation, translation, scaling, coloring, and displaying of different tissue densities (e.g., bone, fat-bone range, etc.). This was accomplished by making novel advancements in techniques for orthogonal texture slicing and memory bandwidth optimization. These were then applied to an iOS device to create the application. This entailed tuning the graphics processing unit (GPU) operations so that interaction remained real-time for a user.

A polished user interface was also developed for use in the latest version of Apple's operating system, iOS 7. This was done using formal feedback from developers, potential customers, and other stakeholders. The labeling of different interaction modes (i.e., tissue types, coloring, etc.) along with artwork was created by the company partner on the project. Extensive testing of the iOS application was performed to identify bugs that were then eliminated.

Lastly, a cloud service for a user's data is being created. This will allow users to easily store and access their CT and MRI studies from either the company partner's desktop software or the iOS application. This system requires several novel techniques to be developed to handle the efficient moving of medical imaging data through the cloud to desktop and mobile devices.

RIF FUNDING: PROGRESS REPORT

Report Type: Interim

Title: MLVAnalyzer™: Enabling a New "Gold Standard" for Bacterial Strain Typing

PI: Dr. Byron Brehm-Stecher

Company Partners (if applicable, company names only): Advanced Analytical Technologies, Inc. (AATI)

Project Goal: To validate the performance and capabilities of AATI's newly developed MLVAnalyzer™ parallel capillary electrophoresis system. Elements to be examined include this instrument's reproducibility, discriminatory power, ease of use and comparability of results to existing high-cost MLVA analysis systems. This validation will be performed in Dr. Brehm-Stecher's Rapid Microbial Detection and Control laboratory using *Salmonella* as a model organism.

Publications/presentations based on project:

Oral presentation: Varineau, P., ISU HRI-ID Spring Symposium, April 22-23, 2013, Reiman Gardens, Ames IA
Title: "Application of Capillary Electrophoresis to gDNA Characterization, DNA Library Assessment, Mutation Detection, and DNA-based Typing Methods for Bacterial Pathogens"

Poster presentation: American Society for Microbiology General Meeting, May 18-21, 2013, Denver, Colorado
Title: "Use of a Low-Cost Multi-Color Fluorescence Capillary Electrophoresis Unit for the Differentiation of *Salmonella* species"
Hyun-Joong Kim**, Dr. Byron Brehm-Stecher**, Angie Oppedahl*, Pierre Varineau*, Ho-Ming Pang*, and Wei Wei*; **Iowa State University, Food Science and Human Nutrition; *Advanced Analytical Technologies, Inc., Ames, IA

College of Human Sciences news story: http://www.hs.iastate.edu/2013/09/30/partnership-improves-food-safety/
This story reported on our RIF/POCI work with Advanced Analytical and was published on the CHS website, CHS and FSHN Facebook sites, CHS Twitter site and was also featured in a CHS Alumni Brochure reporting on the College's successes and breadth of activities.

Poster submission: Data collection using refined instrumentation and software is ongoing for a January 21, 2014 submission to the International Association for Food Protection Annual Meeting, August 3-6, 2014, Indianapolis, IN

Invention disclosures: none this period.

External funding applied for (indicate received/denied/pending): Immediately prior to application to RIF, funding was sought from USDA and NSF Phase I SBIR programs. Neither grant was awarded, but some reviewer comments were encouraging. We plan to resubmit to the USDA program closing September 26th, 2013. We may utilize the Iowa Innovation Corporation's pre-proposal screening service as a means to obtain additional pre-submission feedback prior to this submission.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

The MLVAnalyzer™ (Advanced Analytical Technologies, Inc, Ames, Iowa) allows for rapid strain tracking of pathogens using traditional multiplex PCR amplification and identification of Short Tandem Repeats (STRs) using a multicolor fluorescence capillary electrophoresis system. The CE system is competitively priced with pulsed-field electrophoresis systems, and allows smaller laboratories to apply the powerful MLVA technique for pathogen identification. We examined the feasibility of this technology for routine strain identification and differentiation of *Salmonella* isolates.

DNA was extracted from 10 ATCC cultures and 25 isolates of *Salmonella* Typhimurium identified through traditional testing. End-labeled fluorescent primers against 5 VNTR (Variable Number Tandem Repeat, a type of STR)

regions on the *Salmonella* genome were synthesized. Multiplex PCR amplifications were performed (2 reactions per isolate), generating 5 differently-sized PCR products. These end-labeled fragments and an internal size standard were separated by the MLVAnalyzer™ system and a user-compiled pattern library was created.

Multiplexed PCR targeted to the STR regions in the *Salmonella* genome produced amplified products ranging in size from approximately 150 - 500 base pairs. These products were adjusted to a working dilution and loaded onto 96-well PCR plates for analysis. The plates were analyzed using the newly developed The MLVAnalyzer™ instrument. Products migrated based on size and were detected by fluorescence from incorporated primers. Results from multiple experiments confirmed the single base-pair resolution and repeatability of the method. The software provides rapid data processing and interpretation, enabling accurate, automated differentiation of MLVA patterns from the *S*. Typhimurium strains analyzed.

The MLVAnalyzer™ developed and validated during this rapid concept-to-solution granting period provides reliable STR-based strain identification for outbreak investigations, source identifications and dendrogram mapping studies. Our work has validated the hardware needed to unlock MVLA's potential for broader use in industry for typing of this and other bacterial pathogens. This represents the first step toward implementing a rapid, equivalent cost replacement for Pulsed-Field Gel Electrophoresis (PFGE), the current "gold standard" typing approach. We expect that availability of this resource will ultimately result in broad usage/acceptance among various users, including The Centers for Disease Control and Prevention (CDC), state public health laboratories, International PulseNet participants, additional Federal agencies with mandates for tracking of bacterial pathogens, world health organizations and pharmaceutical companies. Ultimately, we expect this enabling technology will ease pathogen tracking, promote timely intervention of disease and will serve as an important tool in the ongoing effort to reduce the human, economic and sociological burdens of bacterial disease.

Since our last update, AATI reports significant external interest in the system. They are working with a third party to develop a refined MLVA system that meets this stakeholder's analytical needs. This technology has involved significant software development efforts. Dr. Brehm-Stecher's and Kim's work has helped AATI better understand the software user interface and the types of algorithms and outputs required of MLVA systems.

RIF FUNDING: PROGRESS REPORT

Report Type: Interim

Title: Bioassay-guided Fractionation to Isolate, Analyze and Characterize Therapeutic Compounds from *H. gentianoides*

PI: Eve Wurtele

Company Partners (if applicable, company names only): BioScience Research Capital, LLC

Project Goal: Purify and assay bioactive compounds from *H. gentianoides* and test them for potential therapeutic properties on a large scale.

Publications/presentations based on project: none yet

Invention disclosures: none yet

External funding applied for (indicate received/denied/pending): none yet (SBIR in progress)

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

To date we have collected seeds, grown plants under optimal conditions for metabolite production, and harvested the plant material needed for this project. In parallel we have developed/improved the appropriate methods for processing crude *Hypericum* extracts on a large scale. We have quantified yields and information is being entered into PMR database. We also developed new methods for purifying the bioactive compounds needed from *Hypericum* extracts at a semi-preparative scale.

We have used the semi-preparative methods we developed to extract and purify sufficient bioactive compounds from *Hypericum* for initial testing. We have provided these to BioScience Research Capital, LLC , and the first stage of first stage of testing is in progress. Testing for activity is being conducted at an independent company, which will independently analyze the samples that we provide them, and have established all general protocol for analysis.

Because the preparative column and associated pump that we needed for this research was no longer functioning, we made and provided a liter of processed *Hypericum* extract and sent it to a commercial company who specialize in large-scale compound separations.

RIF FUNDING: PROGRESS REPORT

Report Type: Interim

Title: Titanium Atomization Melt Delivery Tube Lifetime Assessment

PI: Iver Anderson

Company Partners (if applicable, company names only): Iowa Powder Atomization Technologies, Inc. (IPAT)

Project Goal:
The primary goal of this project was to test the ability to integrate IPAT's licensed pour tube into a commercial capacity titanium melting system with a different heating configuration compared to that established at Ames Laboratory. If successful integration is realized, testing of the tube lifetime will be conducted by pouring molten titanium through the tube and analyzing the resulting metal and pour tubes.

Publications/presentations based on project:

- "Improved fine powder production of titanium alloys using close-coupled gas atomization" by A.J. Heidloff, J.R. Rieken, and I.E. Anderson was presented at the *Materials Science and Technology 2013* Conference in Montreal, Canada. **(invited talk)**
- Developments in close-coupled gas atomization for additive manufacturing" by J.R. Rieken, A.J. Heidloff, and I.E. Anderson to be presented at the special *Additive Manufacturing using Powder Metallurgy (AM/PM)* symposium at the annual *MPIF 2014 Conference* in Orlando, FL. **(invited talk)**

Invention disclosures: None

External funding applied for (indicate received/denied/pending): Previous work on a prototype close-coupled titanium gas atomizer has been generated by multiple funding sources to allow for the work being conducted within the scope of this project.

- Subcontract proposal entitled: "Generation of Fine Spherical Ti Alloy Powder for Net-Shape Powder Injection Molding of High Performance Fastners," for $240,000 as part of the full proposal, "Innovative Net Shape Manufacturing of Small Parts Using Titanium Powder," for $963,015 to the Industrial Base Innovation Fund II of the Defense Logistics Agency **(denied).**
- Subcontract entitled: "Feasibility Tests for Large Scale Advanced Titanium Powder Production," for $830,000 as part of the full proposal, "Near Net Shape Manufacturing For Current and Future Generation Munitions and Armament Systems **($270,000, program only active 1 year)**.
- Proposal entitled: "Design and Completion of Advanced Titanium Gas Atomizer," through the Iowa State University Research Foundation for $25,000 **(received).**
- Proposal entitled: "Supplemental Support of Advanced Capability for Titanium Melting," through the Iowa State University Research Foundation for $25,000 **(received).**
- Subcontract proposal entitled: "Development of Gas Atomization System to Produce Fine Spherical Titanium Powder," under Northern Illinois University for $30,000 **(received).**
- Supplement to subcontract award entitled: "Development of Gas Atomization System to Produce Fine Spherical Titanium Powder," under Northern Illinois University for $20,000 **(received).**
- Proposal entitled: "Lightweight High Performance Structures by Energy Efficient, Cost Effective Manufacturing with Advanced Titanium Powders," through Ames Laboratory-USDOE to the ARPA-e Modern Electro/Thermochemical Advances in Light-Metal Systems (METALS) for $10,000,000 over 3 years **(denied)**.
- Provided Technical Example Project, "Net-Shape Manufacturing of Low Cost Titanium Powder Products" costing federal funds of $4.7M over 2 years with $3.7M of matching private funds ($8.4M total request), for Concept Paper entitled: Lightweight & Advanced Materials Manufacturing Innovation Institute (LAMMII) that was submitted by Iowa Innovation Corporation in reply to "Lightweight and Modern Metals Manufacturing Innovation (LM3I) Institute," offered under ONRBAA13-019 as part of the recent (July 2013) NNMI call **(denied)**.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

A series of IPAT licensed pour tubes were fabricated at Ames Laboratory for use in a commercial-size titanium melting system. Discussions with the third party melting company allowed for the correct geometrical changes for integration into the third party melting system. Over the course of three separate trips the pour tubes were brought by Ames Lab personnel on-site to the third party.

On the first visit a sub-set of the pour tubes were tested for heating response in the commercial melting system; no titanium metal was present in the melting crucible. This was done to allow for observation of the tube with the commercial heating configuration. Of the sub-set of tubes tested in this manner, the best performing geometry was chosen for further melting and casting experiments.

Over the three trips, casting trials were conducted using Ti-6Al-4V with the selected pour tube geometry although the pouring orifice was varied to change the metal flow rate. On the first trip there was one successful casting out of two attempts (1 of 2), with (2 of 4) and (2 of 3) for the second and third trips respectively. The total success rate (5 of 9-55%) is significantly higher than any other technology the third party had ever observed. It should be noted that all failed trials were related to other causes, not the IPAT pour tube.

The five trials resulted in casting weights of 40.5, 59.25, 72, 77, and 107 pounds. The 107 lb. pour was the largest cold-wall induction bottom pour ever recorded. All but one of the castings fell within the industrial chemistry standard. The full set of process parameter data that was recorded during the casting trials (along with wet chemistry analysis of each casting) allowed for a very positive evaluation of the licensed pour tube performance.

Principal Investigator	FY13 i6 Projects (to finish May 31, 2014)	Award Amount
George Kraus	Bio-based Production of Terephthalic Acid and other Aromatic Molecules (Phase I and Phase II)	$100,000
Basil Nikolau	SoLysTE: A start-up focused on novel biocatalysts for the production platforms of diverse fatty acid products (Phase I and Phase II)	$99,000
Basil Nikolau	Characterization of Biocatalysts for Novel Production Platforms for Diverse Bi-functional Precursors of Polymers and Surfactants (Phase I)	$50,000
Alex Stoychev	Reducing the Total Energy Footprint of Popular Mobile Apps Through Better Algorithms (Phase I and Phase II)	$100,000
Principal Investigator	**FY13 PSI Projects (to finish May 31, 2014)**	**Award Amount**
Thomas Lubberstedt	Development of Midwest-adapted and specialty inducer for haploid production in corn (Phase I and Phase II)	$55,235

i6 FUNDING: PROGRESS REPORT

Report Type: Interim

Title: Bio-based Production of Terephthalic Acid and other Aromatic Molecules

PI: George Kraus

Company Partners (if applicable, company names only): SusTerea

Project Goal: Ultimately the aim is to make coumalic acid into a platform molecule with a range of chemical outcomes.

Publications/presentations based on project:
G. A. Kraus, G. Pollock RSC Advances. Submitted for publication.

Invention disclosures:
ISURF 04029

External funding applied for (indicate received/denied/pending):
SECO, 2102, denied
AIR 2012, denied
SECO, 2013, pending
AIR 2014, in preparation

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Terephthalic acid is a commodity chemical produced from petroleum feedstocks. The most common synthesis pathway is the oxidation of para-xylene using transition metal catalysts. Terephthalic acid and dimethyl terephthalate are employed in the preparation of polyethylene terephthalate (PET), a thermoplastic polymer used in many beverage and food containers and in fabrics, and polytrimethylene terephthalate, a material used in carpets and upholstery. Global production of terephthalic acid was over fifty million tons in 2009. An effective, green route to terephthalic acid could have a large impact. Coumalic acid is a key intermediate in our approach to terephthalates and benzoic acid-based surfactants. We recently reported that Diels-Alder reactions of coumalic acid with alpha-olefins produced para-substituted benzoic acids in 99% para-selectivity. In order for this remarkable transformation to become industrially useful, a viable and scalable synthesis of coumalic acid is needed.
A strong acid and heat was needed to protonate malic acid. We examined several strong anhydrous acids and several solvents. Using acetic acid or trifluoroacetic acid without sulfuric acid gave small amounts of O-acylated products and returned starting material. The more strongly acidic sulfonic acids triflic acid and nonafluorobutanesulfonic acid gave coumalic acid in good yields, while methanesulfonic acid gave mixtures of coumalic acid and fumaric acid. With the best conditions discovered to date, we scaled up the reaction with triflic acid and obtained an 86% isolated yield of coumalic acid on a five-gram scale. Either racemic or L-malic acid can be used in this transformation. We have recently devised a one-pot route to the methyl ester of coumalic acid from malic acid.

i6 FUNDING: PROGRESS REPORT

Report Type: Interim

Title: SoLysTE: A start-up focused on novel biocatalysts for the production platforms of diverse fatty acid products

PI: Basil Nikolau

Company Partners (if applicable, company names only):

Project Goal: This i6-Green project will leverage our previously established screening platform to identify thioesterase enzymes specific for producing fatty acids at each specific chain length. Each of these fatty acids has potential commercial interests with different industrial and food applications, represented by several CBiRC company members. Moreover, the project will build the fundamental basis for a start-up company based on these technologies, now named VariFAS Biorenewables.

Publications/presentations based on project:
M. D. Yandeau-Nelson. **"Combinatorial integration of novel biocatalysts to form innovative bi-functional carboxylic acids";** Presentation to the Industrial Advisory Board for the Center for Biorenewable Chemicals at ISU. May 14, 2013.

M. D. Yandeau-Nelson. **"Project Update: Combinatorial integration of novel biocatalysts to form innovative bi-functional carboxylic acids";** Presentation to the Industrial Advisory Board for the Center for Biorenewable Chemicals at ISU. October, 2013.

External funding applied for (indicate received/denied/pending): Results from this project were included in a grant application to the NSF-SBIR program, submitted on December 2, 2013.

Progress report:

Technical results: Our goal was to determine functionality of 25 thioesterases (isolated from diverse biological sources) in terms of enzymatic activity and fatty acid productivity using our established screening protocols (Jing et al., 2011). We selected genes encoding for 30 uncharacterized bacterial thioesterases, and these were commercially synthesized. A total of 27 thioesterases were successfully evaluated for the types of fatty acids that they can generate in our established screening platform. This collection of thioesterases provided novel fatty acid profiles, including some that showed distinct preferences for producing short chain fatty acids (<8 carbon atoms) and others that produced equal amounts of fatty acids and fatty acid derivatives (methylketones). Other thioesterases produced appreciable quantities of unsaturated fatty acids, which have potential as feedstocks for straightforward chemical conversion to alpha-olefins. For example, the primary products for one thioesterase were butanoic and butenoic acids, comprising ~65% of total fatty acid production. Biological production of butenoic acid is of potential commercial interest, because it can be chemically converted to the alpha-olefin, propylene, which is currently produced from petroleum-based feedstocks and is widely used by industry to produce polypropylene and other downstream chemicals. Butanoic acid has potential commercialization application as an antimicrobial agent in food preservation.

Commercialization results: During the i6 funding period, the core business concept and commercial feasibility was explored and developed within CBiRC's Biobased Foundry, which explored VariFAS' value proposition, target products, and potential market segments. Extensive conversations with BASF, Cargill, Ashland, Procter & Gamble, and Elevance identified that product streams that are a single fatty acid (i.e., a near homogeneous source of an individual fatty acid) are highly valued to some markets (e.g., monomers for polymers). Although VariFAS has the potential to produce different, and currently rare (and therefore higher value) fatty acids, including saturated and unsaturated fatty acids of different chain lengths, we will initially target MUFAs, which also have the potential of being chemically converted to a large number of products. Specifically, VariFAS has targeted the MUFA, 7-tetradecenoic acid (14:1Δ7), as the minimal viable product. The market analysis and the conversations

with CBiRC member companies revealed more than ten products that can be chemically produced from this VariFAS' MVP. The chemical derivatization processes that will transform VariFAS platform chemicals to downstream products are well developed in the oleochemical industry, and these include such reactions as hydrogenation, esterification, ozonolysis, metathesis, epoxidation, and isomerization. While it may be possible for VariFAS to do these simple derivatizations, and market these derivatives, VariFAS's current expertise is in the development of the biocatalysts to generate the MUFAs as the platform feedstock for further chemical derivatization.

Therefore, VariFAS has developed interactions for future partnerships to evaluate these chemical derivations of our products. For example, Elevance and BASF are developing metathesis technology to transform seed oils into high value products. They have shown considerable interest in our homogeneous products as a platform feedstock.

From this initial market analysis, we determined that VariFAS will first market its products in the surfactant and lubricant sectors, because these markets have lower entry barriers and are easier for VariFAS to rapidly impact. The revenues generated from engaging in the surfactant and lubricant markets will be used to support VariFAS to expand into the polymer market, which is larger and a higher-reward market.

The surfactant and lubricant markets are expected to reach $36 billion and $65 billion, respectively by 2018. The bio-surfactant and biolubricant markets have a much higher growth rate than the overall market growth rate, mainly driven by the increasing demand for greener products from the consumer end, which is a great opportunity for VariFAS bio-based products. VariFAS will gradually enter the polymer market, which has the highest entry barrier, by developing bio-based dicarboxylic acids and polyols that have the potential to impact the polyamides and polyesters industry. The market sizes for these two sectors are projected to be $27 billion and $23 billion, respectively by 2018.

i6 FUNDING: PROGRESS REPORT

Report Type: Interim Report

Title: Characterization of Biocatalysts for Novel Production Platforms for Diverse Bi- functional Precursors of Polymers and Surfactants

PI: Basil Nikolau

Company Partners (if applicable, company names only): OmegaChea Biorenewables LLC

Project Goal: Purification and characterization of ten diverse KASIII genes to identify enzymes with maximum activities with specific substrates.

Publications/presentations based on project:

- Poster presentation at the 2013 ASBMB Meeting, April 2013, Boston, MA
- Poster presentation at the 5th Annual CBiRC NSF Site visit meeting, May 2013, Ames, IA
- Poster presentation at the 5th Annual CBiRC working meeting, Oct 2013, Ames, IA
- Yandeau-Nelson. "Using diverse KASIIIs for functionalizing the omega-end of fatty acids" presented at the CBiRC Annual Working Meeting, Oct 2013, Ames IA
- Garg, Stewart, Yandeau-Nelson, Noel, Nikolau. "Delineating the structure-function relationships of β-- Ketoacyl-ACP Synthase III based on phylogenetic and functional comparisons". Manuscript in preparation for the Journal of Biological Chemistry.
- Garg, Jin, Stewart, Yandeau-Nelson, Noel, Nikolau. "Identification of KASIII enzymes with novel substrate specificities: Demonstration of in vivo production of novel ω-1 hydroxylated fatty acids using a novel KASIII". Manuscript in preparation for the Journal of Biological Chemistry.

Invention disclosures: ISURF 04083 and associated Provisional US Patent Application #61/755,946, entitled "Materials and methods for using a 3-ketoacyl-acyl carrier protein (ACP) synthase III (KASIII) for production of bi-functional fatty acids", S Garg, H Jin, MD Yandeau- Nelson, BJ Nikolau (2013)

External funding applied for (indicate received/denied/pending):
NSF STTR Phase I Award (Received – July 2013)
CBiRC Student Leadership Sponsored Grant awarded to Shivani Garg (Received Jul-Aug 2013) -$10,000

Interim report:

In Phase I of this project, we successfully expressed and purified 3-Ketoacyl ACP Synthase III enzymes from ten diverse biological sources. Our aim was to identify specific KASIII enzymes that have maximum activities with different starter substrates, and thereby develop the catalytic technology to produce different fatty acid products. We conducted in-vitro enzyme assays on each of the ten diverse KASIII enzymes to ascertain the activity and substrate specificity of these enzymes with various acyl-CoA starter substrates, including straight chain, branched chain and hydroxylated acyl CoAs. Our data showed that five KASIIIs exhibited comparable activities with branched chain substrates.

In Phase II of the project, we developed a high-throughput thermal binding assay to screen for binding of various acyl-CoA starter substrates with each of the ten diverse KASIII proteins. Our goal was to identify KASIII enzymes that can bind to unusual starter substrates such as hydroxylated, aromatic and acidic acyl-CoAs. Our data identified at least three KASIII enzymes capable of binding unusual starter substrates and subsequent in-vitro enzyme activity assays (as described above) confirmed that these KASIIIs were not only capable of binding these unique acyl-CoA substrates but were also enzymatically active on these substrates.

To understand the structural architecture of KASIII and the relationship of structure to substrate specificity, we initiated a structural study of these enzymes. From an initial crystallization screen, we identified two sets of conditions that yielded crystals of the KASIII protein and we are currently optimizing crystal formation for downstream crystallography and structure determination.

In this study we have identified four KASIII enzymes that exhibit novel substrate specificities and in the future can be used in an engineered system to produce novel fatty acids with new functional groups (branched, hydroxyl, aromatic and acidic groups) at their terminal ω-ends. Such functionalized fatty acids can have applications in the bio-based polymer industry. For example, branched fatty acids have utility as surfactants and lubricants at low tempreratures and hydroxylated fatty acids have potential applications in polymers, surfactants and lubricants.

OmegaChea now has two half-time employees, including a senior research scientist and a business manager, who has assisted in commercialization efforts for the KASIII technology. During the i6- funding period we conducted market feasibility analysis and developed a business model and a business plan, and also sought funding from various state and federal sources. OmegaChea won the Pappajohn Student Business Plan Competition in May 2013 and made it to the latter stages of the Pappajohn Iowa Business Plan Competition.

In July, OmegaChea secured an NSF STTR Phase-I award that will help develop a platform for production of OmegaChea's first bi-functional fatty acid product. As part of the STTR project, OmegaChea is working with the NSF-sponsored LARTA Commercialization Assistance Program (CAP1) to further develop its commercialization plan and develop a competition and risk assessment matrix. Upon successful completion of the STTR Phase I award, OmegaChea plans to apply for an STTR Phase II award. In addition, we plan to engage in the Entrepreneurs Organization Iowa Fellowship Program to further develop our business strategy and for networking opportunities.

i6 FUNDING: PROGRESS REPORT

Report Type: Interim

Title: Reducing the Total Energy Footprint of Popular Mobile Apps Through Better Algorithms

PI: Alex Stoytchev

Company Partners (if applicable, company names only): N/A

Project Goal: Develop a proof-of-concept application that shows the feasibility of our approach for reducing the energy footprint of popular mobile apps.

Publications are in preparation. Also, we gave two more presentations on this technology to panels of internal and external experts that ISURF convened.

Invention disclosures: No new disclosures.

External funding applied for (indicate received/denied/pending): None yet.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

The goal of this project is to investigate if a new class of algorithms can be used to reduce the total energy footprint of some popular smart phone applications. As promised, we developed a proof-of-concept application that runs in real-time on an Android phone. The application is stand alone, i.e., it runs only on the smart phone and does not require external resources, which consume power at a remote location. For example, it does not require a cellular network or even an Internet connection in order to function properly. Off-line tests to improve the speed of the new class of algorithms even further were also performed and were successful. The proof-of-concept prototype is ready and it should help with the commercialization prospects of this technology.

Since the last report, we have continued to work toward improving and speeding up this technology. The goal for the second proof-of-concept prototype is to scale up and to broaden the scope of applications. We have also made some theoretical breakthroughs, which enabled us to prove some nice properties of our algorithms (in addition to the empirical proofs that were presented earlier). We gave two more presentations on this technology to panels that ISURF convened. The feedback that we received was encouraging.

PSI FUNDING: PROGRESS REPORT

Report Type: Interim

Title: Development of Midwest-adapted and specialty inducer for haploid production in corn

PI: Ursula Frei; Thomas Lubberstedt

Company Partners (if applicable, company names only): N/A

Project Goal: Developing haploid inducing genotypes adapted to different environments and applicable in specialty corn

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Publications/presentations based on project: N/A

Invention disclosures:
ISURF #4065 – Lubberstedt, Thomas – Development of a haploid inducing genotype (inducer) adapted to the Midwest for maize
ISURF#04099 – Lubberstedt, Thomas - Haploid inducing genotype for specialty corn

External funding applied for (indicate received/denied/pending): N/A

Progress report:

Mid West Adapted Inducer (MWID):
10 promising lines (F5/F6) related to B73 were tested during winter season 12/13 for their induction ability, using a commercial hybrid as tester. For three lines the induction rates were as high as for the RWS/RWK-76 inducer (reference genotype), based on screening a minimum of 3000 induced kernels per line. The bulked offspring of these three promising lines will be tested in summer 2013 again for their induction rate in a commercial hybrid and inbred lines representing the different heterotic groups in maize. Agronomic traits will be recorded and as much seed as possible produced for the planned release. Final induction data will be available towards the end of fall 2013. A release is planned for end of 2013.
F3 and F4 families of additional inducer lines in other genetic backgrounds than B73 will be tested this summer for their induction ability for the first time.

Induction rates determined summer 2013 of the three tested new inducer lines developed in the background of B73 were 87%, 103% and 128% compared to the induction rate of the inducer hybrid RWS/RWK-76 (100%). The germination rate of the best inducing line was lower compared to the two others and also the seed set on the test donor was only ca. 78% compared to the seed set obtained with RWS/RWK-76. The line with comparable induction rates to RWS/RWK-76 looks promising. As the overall seed set on the new inducer lines was not satisfying after the plants got severely damaged through a hail, we decided to use the winter 2013/2014 nursery for another round of seed increase and additional testing. Thus the new B73 based inducer lines are ready to be released in April 2014.
Five sets of inducer lines in other genetic backgrounds than B73 are now in generations F5 (Mo17) and F4 (Fr19, LH82, OH43, PHR36). Selected lines are tested in the winter nursery for their induction ability. An additional group of inducer lines generated in 24 genetic backgrounds of different heterotic groups is now in generation F3. These sets of lines are momentarily grown in the greenhouse and marker selected for the two major QTLs for induction ability.
We are in the process to test the idea of a hybrid inducer – our "prototype", a cross between our best inducing B73 line and an F4 Mo17 line is momentarily grown in the winter nursery to determine the induction rate and agronomic performance of the hybrid inducer.

Specialty Inducer:

a) Popcorn Inducer (PCI)

From the 22 single ear descents, that were tested in winter 12/13 for their induction ability on popcorn maize as tester, six showed promising induction rates. Single ear descents from genotypes with favorable tassel traits were selected within these families. 32

resulting families will be tested this summer for their induction rates using a commercial hybrid and a popcorn as testers. The focus is on progenies that have an additional root color marker for haploid selection, as selection based on R1-nj alone seems to be difficult in popcorn. The materials planted this summer are F_2 populations. Thus, at least another two generations of self pollination and selection will be necessary to obtain a reasonably stable line for release (fall of 2014).

From the 32 families tested in summer 2013, we selected 48 single cobs representing 6 families for further testing in the winter 2013-2014 nursery. The average induction rate of the families ranged between 8% and 18% on the commercial hybrid – RWS/RWK-76 achieved 13.7%. Four of the selected families have the additional red root marker for haploid selection. Test germinations with induced popcorn seed showed, that this marker is suited for selection in popcorn lines.

b) Indian Corn Inducer

Indian Corn is used for the production of natural colors. The conventionally used marker genes for haploid selection cannot be used in this heavily colored genetic background. During winter 12/13 we started test crosses between Indian Corn and several genotypes bearing novel selectable marker genes, which we intend to introduce into our haploid inducer program. These experiments will be continued during summer 2013.

We identified a seedling marker, which could be used in the dark colored genetic background of the Indian Corn. Inducer development adding this trait to our inducer lines is started. This winter F2 progenies are grown in the greenhouse for marker selection and F3 production.

Iowa State University - as of December 31, 2013
Innovation Fund Appropriations

	FY 2013 Innovation Fund Appropriation		**$1,050,000**
1	Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture and SBDC	$350,000	
2	Commercialization Program	$500,000	
3	Infrastructure Projects and Programs	$200,000	

Iowa State University	**Project**	**List of all FY 2013 Revenue Sources**	**Revenue Dollars for FY 2013**	**Amount of FY 2013 State Appropriations Expended as of 12/31/2013**
1	**Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture**	FY 2013 State Appropriations (INNOV)	$1,050,000	$758,944
		FY 2013 Matching Funds (General Fund)	$869,675	
		FY 2013 Matching Funds (In-Kind)	$206,227	
		FY 2013 Matching Funds (Cash)		
Description of Project	See Individual Projects			
Plans				

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2013**	**Amount of FY 2013 State Appropriations Expended as of 12/31/2013**
Unit	ISU Research Park		$75,000	$75,000
Purpose	Support for the operations of the ISU Research Park.			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2013**	**Amount of FY 2013 State Appropriations Expended as of 12/31/2013**
Unit	ISU Pappajohn Center		$100,000	$97,401
Purpose	Provide Support fo the entrepreneurial programs at Iowa State including services for start-up companies			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2013**	**Amount of FY 2013 State Appropriations Expended as of 12/31/2013**
Unit	Biobased Foundry Pilot Project		$50,000	$31,609
Purpose	Foster entrepreneurship on campus by engaging graduate students in an immersive entrepreneurial experience. The course is offered in the Spring			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2013**	
Unit	Vice President for Research		$20,000	$20,000
Purpose	These funds support the general operations of the industry relations function at Iowa State such as efforts related to the regional marketing effort s with Ames and Des Moines, support for trade show booths/materials/attendance, company visits, association membership fees, etc.The Regents Innovaiton Fund commercialization program is administered in the VPRED office as well as efforts to coordinate industry relations and other tech transfer activities across campus.			
Unit	Small Business Development Center		$105,000	$105,000
Purpose	Support for the Small Business Development Center to make up for legislative budget cuts.			

Iowa State University	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
2	**Commercialization Program**	FY 2013 State Appropriations (INNOV)		Summarized at top
		FY 2013 Matching Funds (General Fund)		
		FY 2013 Matching Funds (Federal Support)		
		FY 2013 Matching Funds (Cash)		
		FY 2013 Matching Funds (In-Kind)		
Principal Investigator	Byron Brehm-Stecher		$50,000	$49,372
Description of Project	MLVAnalyzer™: Enabling a New "Gold Standard" for Bacterial Strain Typing			
Anticipated End Results				
Results achieved to Date	The MLVAnalyzer™ (Advanced Analytical Technologies, Inc, Ames, Iowa) allows for rapid strain tracking of pathogens using traditional multiplex PCR amplification and identification of Short Tandem Repeats			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
Principal Investigator	Anumantha Kanthasamy		$52,200	$52,200
Description of Project	Small Molecule Non-receptor Tyrosine Kinase Inhibitors as Novel Neuroprotective Agents (Continuation)			
Anticipated End Results				
Results achieved to Date	Subsequent to the report submitted in July 2013, we had designed and screened additional 10 structural analogs of RM108 as small molecule Fyn kinase inhibitors. The new analogs were not as potent as RM108 in inhibiting Fyn kinase in Z-lyte screening assays. One of them RM121 showed an IC50 4.5µM for Fyn kinase compared 0.35 µM for RM108. Subsequently, we performed pharmacokinetic studies and bioavailability of RM108. Pharmacokinetic study revealed a terminal plasma mean elimination half-life (T1/2) of 1.97 h and brain levels 24.5 ± 4.5ng/g at 30 min following oral administration of RM108 (15mg/kg) to mice. These data suggest that the RM108 analog selectively inhibited the therapeutic target Fyn kinase, was bioavailable in the brain, and was neuroprotective in animal models of PD. The data obtained in this study will help us build strong case of resubmission of our NIH R21 grant to further expand our CNS drug discovery project. We would like to thank Proof of Concept Initiative (POCI) of GIVF at Iowa State for their kind support.			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
Principal Investigator	Eliot Winer		$65,000	$28,939
Description of Project	Visualization of Medical Data on Mobile Devices for Training, Diagnosis and Treatment			
Anticipated End Results				
Results achieved to Date	An iOS application has been developed during the time of the project. This allows a user to load in a computed tomography (CT) or Magnetic Resonance Imaging (MRI) datasets and view them in interactive 3D. A user can fully manipulate the representation through rotation, translation, scaling, coloring, and displaying of different tissue densities (e.g., bone, fat-bone range, etc.). This was accomplished by making novel advancements in techniques for orthogonal texture slicing and memory bandwidth optimization. These were then applied to an iOS device to create the application. This entailed tuning the graphics processing unit (GPU) operations so that interaction remained real-time for a user. A polished user interface was also developed for use in the latest version of Apple's operating system, iOS 7. This was done using formal feedback from developers, potential customers, and other stakeholders. The labeling of different interaction modes (i.e., tissue types, coloring, etc.) along with artwork was created by the company partner on the project. Extensive testing of the iOS application was performed to identify bugs that were then eliminated. Lastly, a cloud service for a user's data is being created. This will allow users to easily store and access their CT and MRI studies from either the company partner's desktop software or the iOS application. This system requires several novel techniques to be developed to handle the efficient moving of medical imaging data through the cloud to desktop and mobile devices.			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
Principal Investigator	Zhiyou Wen		$50,000	$42,509
Description of Project	Development and Optimization of a Pilot-Scale Revolving Algal Biofilm Photobioreactor			
Anticipated End Results				
Results achieved to Date	This project focuses on developing a novel biofilm based photobioreactor (Revolving Algal Biofilm Photobioreactor, RABP) which can be widely adapted by the algae industry for producing fuels and high value products. The RABP reactor can facilitate algal biomass harvest by reducing the harvest cost, which is a major bottleneck in the commercialization of algal biofuel production. We have performed a thorough lab-scale study optimize the RABP operational conditions, so the feasibility of the RABP system is proved. In the development of the pilot-scale RABP system, we constructed a green house in the BioCentury Research Farm, so the RABP system can be accommodated in the greenhouse for a year round operation. The greenhouse was a high premium facility with all the utilities and temperature control by a geothermal unit. Four RABP systems was then fabricated and assembled in the greenhouse. We have successfully run the RABP system for the algal culture in the green house for almost a year starting from January, 2014. As of December 2013 the pilot-scale RABP has been operating continuously (a few stops for mechanical repair) for a year straight. We also recorded daily averages for light intensity and temperature. We are in the process of making a statistical model that can produce a prediction equation that will allow us to predict the productivity of the system based on the average light intensity it receives. This will be valuable when analyzing this systems productivity in other places in the US that have different yearly light intensities. We have also looked at water use efficiency of the RABP system and considered different ways to improve it. Overall, the result shows that the pilot scale RABP system produced better results than the lab-scale RABP study due to the improvement of the light intensity. A polished user interface was also developed for use in the latest version of Apple's operating system, iOS 7. This was done using formal feedback from developers, potential customers, and other stakeholders. The labeling of different interaction modes (i.e., tissue types, coloring, etc.) along with artwork was created by the company partner on the project. Extensive testing of the iOS application was performed to identify bugs that were then eliminated. Lastly, a cloud service for a user's data is being created. This will allow users to easily store and access their CT and MRI studies from either the company partner's desktop software or the iOS application. This system requires several novel techniques to be developed to handle the efficient moving of medical imaging data through the cloud to desktop and mobile devices.			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
Principal Investigator	Eve Wurtele		$50,000	$5,839
Description of Project	Bioassay-guided Fractionation to Isolate, Analyze and Characterize Therapeutic Compounds from H. gentianoides			
Anticipated End Results				
Results achieved to Date	To date we have collected seeds, grown plants under optimal conditions for metabolite production, and harvested the plant material needed for this project. In parallel we have developed/improved the appropriate methods for processing crude Hypericum extracts on a large scale. We have quantified yields and information is being entered into PMR database. We also developed new methods for purifying the bioactive compounds needed from Hypericum extracts at a semi-preparative scale.			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
Principal Investigator	Iver Anderson		$50,000	$48,978
Description of Project	Titanium Atomization Melt Delivery Tube Lifetime Assessment			
Anticipated End Results				
Results achieved to Date	A series of IPAT licensed pour tubes were fabricated at Ames Laboratory for use in a commercial-size titanium melting system. Discussions with the third party melting company allowed for the correct geometrical changes for integration into the third party melting system. Over the course of three separate trips the pour tubes were brought by Ames Lab personnel on-site to the third party. On the first visit a sub-set of the pour tubes were tested for heating response in the commercial melting system; no titanium metal was present in the melting crucible. This was done to allow for observation of the tube with the commercial heating configuration. Of the sub-set of tubes tested in this manner, the best performing geometry was chosen for further melting and casting experiments. Over the three trips, casting trials were conducted using Ti-6Al-4V with the selected pour tube geometry although the pouring orifice was varied to change the metal flow rate. On the first trip there was one successful casting out of two attempts (1 of 2), with (2 of 4) and (2 of 3) for the second and third trips respectively. The total success rate (5 of 9-55%) is significantly higher than any other technology the third party had ever observed. It should be noted that all failed trials were related to other causes, not the IPAT pour tube. The five trials resulted in casting weights of 40.5, 59.25, 72, 77, and 107 pounds. The 107 lb. pour was the largest cold-wall induction bottom pour ever recorded. All but one of the castings fell within the industrial chemistry standard. The full set of process parameter data that was recorded during the casting trials (along with wet chemistry analysis of each casting) allowed for a very positive evaluation of the licensed pour tube performance. We have used the semi-preparative methods we developed to extract and purify sufficient bioactive compounds from Hypericum for initial testing. We have provided these to BioScience Research Capital, LLC , and the first stage of first stage of testing is in progress. Testing for activity is being conducted at an independent company, which will independently analyze the samples that we provide them, and have established all general protocol for analysis. Because the preparative column and associated pump that we needed for this research was no longer functioning, we made and provided a liter of processed Hypericum extract and sent it to a commercial company who specialize in large-scale compound separations.			

Iowa State University	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2013	Amount of FY 2013 State Appropriations Expended as of 12/31/2013
3	**Infrastructure Projects and Programs**	FY 2013 State Appropriations (INNOV)		Summarized at top
		FY 2013 Matching Funds (General Fund)		
		FY 2013 Matching Funds (Federal Support)		
		FY 2013 Matching Funds (Cash)		
		FY 2013 Matching Funds (In-Kind)		
Principal Investigator	James Reecy		$199,584	$199,583
Description of Project	Enhancing the Ability of ISU Core Facilities to Serve Iowa			
Anticipated End Results				
Results achieved to Date	A Fluidigm Biomark HD system was purchased for the DNA Facility; this is a micro-fluidic-based instrument that performs high-throughput real-time PCR, end-point PCR, and digital PCR, and can analyze gene expression of 48, 96, or 192 samples at a time, for 24 to 96 different genes or variants. The analysis takes approximately 1.5 hours, so that the throughput per day can be as high as ~800 samples. In addition to benefit ISU researchers by offering lower cost sequencing with enhanced capabilities, such as the ability to measure expression of many genes within a single cell, this instrument benefits clients from Iowa biotech companies, government facilities such as the NADC and NVSL, and other academic institutions. An automated Fusion System was purchased for the Material Analysis Research Laboratory. This device is used for the preparation of fused bead samples, prior to analysis by x-ray fluorescence, and replaced a 17-year old that was nearly inoperable because spare parts for repairs were no longer available. The new devices has benefited researchers in Civil, Construction, and Environmental Engineering and the Iowa Department of Transportation as well as clients from Iowa industries. A thermal gravimetric analyzer was also purchased for the Materials Analysis Research Laboratory. This instrument This device is used for heating samples in an inert gas to measure weight change as the sample is heated from ambient to 1200°C. It is a fully automated, high resolution TGA, with autosampler, and replaced a 22-year old device that was nearly inoperable because spare parts for repairs were no longer available and the manufacturer would no longer provide service. This new instrument has benefited ISU researchers in a wide variety of departments (including used by researchers in Ag and Bio Engineering, Civil, Construction, and Environmental Engineering, Chemical and Biological Engineering, Materials Science and Engineering, Ames Laboratory, and the Iowa Department of Transportation), as well as clients from Iowa industry. A heating stage (1000°C) for FEI scanning electron microscope was purchased. This device is used to perform dynamic in-situ analysis of samples in their natural state in a temperature range from ambient-1000°C and benefits ISU researchers by providing a new capability that was not previously available on campus.			

Iowa State University - as of December 31, 2013
ISWJCF Fund Appropriations

	FY 2014 ISWJCF Fund Appropriation		**$1,050,000**
1	Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture and SBDC	$350,000	
2	Commercialization Program	$500,000	
3	Infrastructure Projects and Programs	$200,000	

Iowa State University	**Project**	**List of all FY 2014 Revenue Sources**	**Revenue Dollars for FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
1	**Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture**	FY 2014 State Appropriations (ISWJCF)	$1,050,000	$163,891
		FY 2014 Matching Funds (General Fund)	$81,945	
		FY 2014 Matching Funds (In-Kind)	$9,833	
		FY 2014 Matching Funds (Cash)		
Description of Project Plans	See Individual Projects			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
Unit	ISU Research Park		$125,000	$122,277
Purpose	Support for the operations of the ISU Research Park.			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
Unit	ISU Pappajohn Center		$200,000	$20,911
Purpose	Provide Support fo the entrepreneurial programs at Iowa State including services for start-up companies			

Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2014**	
Unit	Vice President for Research		$20,000	$0
Purpose	These funds support the general operations of the industry relations function at Iowa State such as efforts related to the regional marketing effort s with Ames and Des Moines, support for trade show booths/materials/attendance, company visits, association membership fees, etc.The Regents Innovaiton Fund commercialization program is administered in the VPRED office as well as efforts to coordinate industry relations and other tech transfer activities across campus.			
Unit	Small Business Development Center		$105,000	$20,703
Purpose				

Iowa State University	Project	List of all FY 2013 Revenue Sources	Revenue Dollars for FY 2014	Amount of FY 2014 State Appropriations Expended as of 12/31/2013
2	**Commercialization Program**	FY 2014 State Appropriations (ISWJCF)		Summarized at top
		FY 2014 Matching Funds (General Fund)		
		FY 2014 Matching Funds (Federal Support)		
		FY 2014 Matching Funds (In-Kind)		
		FY 2014 Matching Funds (Cash)		
Iowa State University	**Project**	**Total Project Budget**	**Allocated Dollars FY 2014**	**Amount of FY 2014 State Appropriations Expended as of 12/31/2013**
Principal Investigator	George Kraus		$50,000	$0
Description of Project	Toxicological and Bioequivalence Analysis of Synthetic Procyanidin and Tannin Compounds			
Anticipated End Results				
Results achieved to Date	This project was recently implemented.			
Iowa State University				
3				
Principal Investigator				
Description of Project	Currently engaged in an RFP process to allocateremainder of these funds.			
Anticipated End Results				
Results achieved to Date				

University of Northern Iowa – as of June 30, 2013

Regents Innovation Fund

	FY 2013 RIF Appropriation - $900,000
1. Economic Gardening and Entrepreneurship Outreach	$300,000
2. Technology Transfer and Business Incubation	$300,000
3. Regional Development	$100,000
4. Competitive and Market Intelligence	$50,000
5. National Ag-Based Lubricants (NABL) Center	150,000

University of Northern Iowa	Project	List of all FY 2013 Revenue Sources	5907 Revenue Dollars for FY 2012-2013	Amount Expended as of 12/31/2012	List of all FY 2013 Revenue Sources	5907 Revenue Dollars For FY 2013	Amount of FY 2013 Regents Appropriations Expended as of 6/30/2013
1	**Economic Gardening and Entrepreneurship Outreach**	FY 2013 Regents Appropriations (RIF)	$300,000	$85,863	FY 2013 Regents Appropriations (RIF)	$300,000	$300,000
		FY 2013 Federal Support		$16,502	FY 2013 Federal Support		$30,351
		FY 2013 Other		$91,195	FY 2013 Other		$270.137
Description of Project	UNI Entrepreneurship Outreach proposes to launch a statewide Economic Gardening (EG) program in Iowa to address a compelling need among smaller, locally-owned employer firms for actionable business intelligence and support. UNI will create and certify a strategic research team in accordance with the National Center for Economic Gardening to provide Stage II companies (those with 9-99 employees) with secondary market research and business intelligence.						
Anticipated End Results	The Iowa Economic Gardening Network will be formalized, participating organizations certified, and 50-75 Stage II clients identified for service delivery during calendar year 2013. At least 12 companies will receive expert research team services during the pilot phase between January and June of 2013. Three of MyEntre.Net's entrepreneur resources will be transformed into customizable technology modules increasing overall small business use from 2,000 annually to 2,500. Dream Big Grow Here will expand to ten contests and attract 250 contestants.						
Results Achieved to Date	A pilot program for Economic Gardening has been launched as an advance effort for a statewide program. A Strategic Resource Team has been certified and twelve economic development organizations from throughout Iowa have been trained in EG and have begun referring Stage II business clients for services. Twelve companies were served with EG services and networked services formalized through the pilot. Ten Dream Big Grow Here contests were hosted in the fall of 2013. An additional four regional hosts were placed on a waiting list. The ten contests served entrepreneurs in 66 counties, attracted 225 contestants and generated 100,000 online votes and comments over a four week period. Regional winners will compete in a Pitch-Off event during EntreFest in 2013 in Cedar Rapids, Iowa. Work continues on scaling three MyEntre.Net resources. The Dream Big Grow Here technologies are fully scaled and two others are underway.						
Plans	Economic gardening projects will be conducted for 12 stage II companies in collaboration with local economic developers. MyEntre.Net resources will be reconfigured into stand-alone program modules. These will include Dream Big Grow Here, Business Concierge and Webinars. The sixth annual EntreFest was held in Cedar Rapids, Iowa on March 7th and 8th, 2013.						

University of Northern Iowa	Project	List of all FY 2013 Revenue Sources	5906 Revenue Dollars for FY 2012-2013	Amount Expended as of 12/31/2012	List of all FY 2013 Revenue Sources	5906 Revenue Dollars For FY 2013	Amount of FY 2013 Regents Appropriations Expended as of 6/30/2013
2	**Technology Transfer and Business Incubation**	FY 2013 Regents Appropriations (RIF)	$300,000	$59,758	FY 2013 Regents Appropriations (RIF)	$300,000	$300,000
		FY 2013 Federal Support			FY 2013 Federal Support		
		FY 2013 Other		$132,288	FY 2013 Other		$302,902
Description of Project	UNI continues to advance intellectual property disclosures, protection and commercialization across campus. Strategies for commercialization include licensing, strategic partnerships and new business development. The Innovation Incubator has created a hub facility, coalescing the existing strength of Intellectual Property disclosures and University research with quality business services to support business incubation and growth. The incubator and support facilities offer a physical link between the Iowa business community, campus innovators and faculty researchers to enhance technology transfer. UNI will be forging a formal agreement with the ISU Research Foundation to assist and guide commercialization activities and starting discussions with the University of Iowa Research Foundation.						
Anticipated End Results	UNI expects ten disclosures, two patent applications and two license agreements. UNI's incubator will remain full and graduate 4-5 businesses into the regional economy and launch 15 student businesses in the JPEC student Business Incubator. Five late stage faculty research projects will also be assisted. Formal agreements with ISURF and UIRF will be completed.						
Results Achieved to Date	During FY 2013, 10 disclosures were received with three moving toward commercialization. Six faculty research grants were awarded for early-stage research with commercial potential. UNI has begun active collaboration with the ISU Research Foundation, receiving due diligence technical assistance on five technologies. The Innovation Incubator is full and five companies have recently graduated into the regional economy with one of the companies a former tenant in the Student Business Incubator. The Innovation Incubator conducted a regional BarCamp event, which attracted more than 100 participants to the incubator and led a joint Cedar Valley/UNI Innovation Day with the announcement of the Dream Big Grow Here winner. Another faculty spin-off was started in the past 6 months and a license agreement has been signed with an Iowa company.						
Plans	UNI will continue to focus on commercialization initiatives, including license negotiations and business startups. At least ten intellectual property disclosures will be received with two licensing agreements executed under patent or trade-secret provisions and UNI will conduct a faculty research grant competition. In addition, the Student Business Incubator and Innovation Incubator will remain full, generating spin-off companies for the Iowa economy. UNI will also expand its corporate research and development program to assist existing businesses in Iowa.						

University of Northern Iowa	Project	List of all FY 2013 Revenue Sources	5908 Revenue Dollars for FY 2012-2013	Amount Expended as of 12/31/2012	List of all FY 2013 Revenue Sources	5906 Revenue Dollars For FY 2013	Amount of FY 2013 Regents Appropriations Expended as of 6/30/2013
3	**Regional Development**	FY 2013 Regents Appropriations (RIF)	$100,000	$57,912	FY 2013 Regents Appropriations (RIF)	$100,000	$100,000
		FY 2013 Federal Support		$3,402	FY 2013 Federal Support		$6,237
		FY 2013 Other		$45,158	FY 2013 Other		$101,166
Description of Project	IDM will lead an effort to assess and structure Iowa's regions for economic growth. This will include asset mapping to determine regional strengths and linkages and thereby outline the most appropriate regional boundaries. In partnership with the Iowa Economic Development Authority (IEDA), Regent universities, community colleges, utilities, Professional Developers of Iowa (PDI) and the Iowa Department of Education, IDM will enhance the Business Expansion & Strategic Trends (BEST) of Iowa program.						
Anticipated End Results	Make recommendations for reorganizing Iowa's Regions, focusing on mapping regional strengths and linkages, propose new regional boundaries and suggest best practices for overall structure and leadership. Outline key benefits of regional development and assist Professional Developers of Iowa with communications and implementation.						
Results Achieved to Date	IDM has helped organize Regionalism 2.0 and conducted multiple planning meetings with PDI and steering committee members. IDM worked with IWD to complete regional asset maps for four regions. In addition, IDM worked with a Geography Department professor to outline new regional boundary options for Iowa, ranging from 6 to 16 regions. IDM partnered with utility companies and economic development service providers to update the Synchronist existing industry survey and helped local development organizations conduct more effective existing industry programs. Entrepreneurial community projects were launched in two regions to integrate entrepreneurship into the regional economy.						
Plans	IDM will lead the process for developing a new set of economic boundaries to help restructure and reenergize regions across the state and engage the economic development profession in the process. IDM will continue supporting regional targeting, marketing, organizational management and planning efforts as requested. IDM will participate in the Business Expansion and Strategic Trends (BEST) of Iowa program and expand the Entrepreneurial Communities Project to enhance and increase entrepreneurship initiatives in regional economic development. Working with the BEST of Iowa Partnership, IDM will enhance the data collection and analysis process.						

University of Northern Iowa	Project	List of all FY 2013 Revenue Sources	5908 Revenue Dollars for FY 2012-2013	Amount Expended as of 12/31/2012	List of all FY 2013 Revenue Sources	5906 Revenue Dollars For FY 2013	Amount of FY 2013 Regents Appropriations Expended as of 6/30/2013
4	**Competitive and Market Intelligence**	FY 2013 Regents Appropriations (RIF)	$50,000	$25,339	FY 2013 Regents Appropriations (RIF)	$50,000	$50,000
		FY 2013 Federal Support			FY 2013 Federal Support		
		FY 2013 Other		$25,410	FY 2013 Other		$51,101
Description of Project	Strategic Marketing Services (SMS) will develop and manage a competitive and market intelligence program for mid-sized Iowa companies. The purpose of devoting RIF investments to competitive and market intelligence projects is to expand economic growth across Iowa by stimulating business expansion opportunities. Accurate information is needed to make sound market entry or expansion decisions. Gathering and using data to make decisions is what SMS provides. Established businesses will be required to pay at least one-half of their project cost. SMS expects to assist at least five Iowa companies with advanced competitive and market intelligence projects. Priority will be given to businesses in the state's target industry clusters.						
Anticipated End Results	SMS will complete five competitive intelligence projects to expand market share, increase profitability and expand the workforce and market research projects for smaller Iowa companies and new startups and conduct five market feasibility assessments for technology transfer.						
Results Achieved to Date	SMS has used RIF dollars to provide market research services for the following Iowa companies: Iowa Mold Tooling in Garner; Clean Water Technologies in Cedar Falls; i-Tracking in Cedar Falls; United Equipment Accessories in Waverly; Casey's General Stores in Ankeny; Mid States Steel in Boone; and Plaid Swan in Dubuque. Market research and due diligence was provided to UNI's technology transfer program for five early-stage technologies.						
Plans	SMS will continue to consult with Iowa businesses, entrepreneurs, statewide associations and local governments to conduct competitive intelligence and develop market research plans. In some cases, the client may wish to undertake some or all of the research activities on their own, utilizing the market research plan as a guide. The final piece of competitive and market intelligence assistance will be devoted to phase one market research feasibility assessments for the technology transfer process.						

University of Northern Iowa	Project	List of all FY 2013 Revenue Sources	5908 Revenue Dollars for FY 2012-2013	Amount Expended as of 12/31/2012	List of all FY 2013 Revenue Sources	5906 Revenue Dollars For FY 2013	Amount of FY 2013 Regents Appropriations Expended as of 6/30/2013
5	**National Ag-Based Lubricants (NABL) Center**	FY 2013 Regents Appropriations (RIF)	$150,000	$0	FY 2013 Regents Appropriations (RIF)	$150,000	$150,000
		FY 2013 Federal Support		$15,000	FY 2013 Federal Support		$150,000
		FY 2013 Other			FY 2013 Other		
Description of Project	NABL will evaluate and enhance microwave lubricant production technology by partnering with Cedar Rapids-based companies (Marion Mixers and AMTek) to investigate the effectiveness and economics at pilot-scale production levels of a new microwave-based lubricant production technology. NABL will conduct fundamental research activities including ongoing development of a Continuous Oil Recirculation System (CORS) incorporating biobased oils and derivatives into the diesel engine crankcase. NABL will support Iowa's biobased products Industry through active participation with industry organizations and provide appropriate standardized testing methods and industry compliance to help prevent sub-par products from entering the marketplace, thus protecting consumers, end-users and producers.						
Anticipated End Results	NABL will refine the microwave lubricant production technology, provide fee-based testing services to at least five biolubricant and/or biofuels industry clients and develop or enhance at least three vegetable oil based products.						
Results Achieved to Date	To date, NABL has provided oil testing services to three industry clients, leading to two ongoing product development research relationships with major biofuels and agriculture industry partners. NABL's patent pending microwave-based grease processing technology has been licensed to Marion Mixers in Marion, Iowa and the technology has been refined. Progress is being made in the CORS diesel engine test cell set up and configuration with key support from a major agriculture equipment manufacturer. NABL led working groups at national and international-level lubricants industry association conferences to advocate for biobased lubricant product standards and industry acceptance.						
Plans	The NABL Center will continue to collaborate with industry partners on development of full-scale microwave-based biolubricant manufacturing processes and equipment, measure and evaluate final product quality differences and identify major cost drivers in vegetable lubricant processes for comparison of microwave vs. traditional methods. New research work investigating the isolation of specific fatty acids such as lubricant feedstocks, coupled with new derivatives of soybean and other oilseeds, will continue and shows potential for expanded value-added activities in Iowa's biobased products manufacturing industry. NABL will participate with industry organizations to provide appropriate standardized testing methods and compliance.						

University of Northern Iowa – as of December 31, 2013

ISWJCF Appropriations

	FY 2014 ISWJCF Appropriation - $900,000
1. Economic Gardening and Entrepreneurship Outreach	$200,000
2. Technology Transfer and Business Incubation	$475,000
3. Regional Development	$125,000
4. Competitive and Market Intelligence	$100,000

University of Northern Iowa	Project	List of all FY 2014 Revenue Sources	5993 Revenue Dollars for FY 2014	Amount Expended as of 12/31/2013	List of all FY 2014 Revenue Sources	5993 Revenue Dollars For FY 2014	Amount of FY 2014 Regents Appropriations Expended as of 6/30/2014
1	**Economic Gardening and Entrepreneurship Outreach**	FY 2014 Regents Appropriations (ISWJCF)	$200,000	$48,365	FY 2014 Regents Appropriations (ISWJCF)	$200,000	
		FY 2014 Federal Support			FY 2014 Federal Support		
		FY 2014 Other		$85,492	FY 2014 Other		
Description of Project	UNI Entrepreneurship Outreach will focus upon implementation of Advance Iowa statewide; sharing MyEntreNet modules and the creation of new technologies to fill gaps in the ecosystem; continue support for the MyEntre.Net resources found at IA SourceLink.com; improve small business access to the Business Concierge and assess the needs of Iowa small business owners statewide.						
Anticipated End Results	During the first year of statewide effort, Advance Iowa will serve between 40-50 Stage II companies with advanced technical assistance statewide. Dream Big Grow Here will host ten regional contests, attract 300 contestants statewide, and draw 500 attendees to the pitch off party. 25-30 Iowa service provider partners will iframe the Business Concierge into their own sites, improving small business access to Business Concierge services. MyEntre.Net will facilitate 24 webinars in FY14. Each will be archived and marketed. A webinar subscription service will be explored; Speak Out Small Business will register 200 small business bloggers and generate 1,000 readers each month. The 3rd annual statewide survey of small business owners will be conducted.						
Results Achieved to Date	18 Stage II clients have been served with Advance Iowa services through November, resulting in 2 new products introduced into the marketplace, 5 jobs and an out of state expansion of a professional services company. 10 regional Dream Big Grow Here contests were hosted by mid-year, serving 181 contestants and generating 105,000 votes and comments and nearly one million pageviews. Webinars have taken off with 1,133 attendees to date, across 11 webinars – a new record. 178 small business owners have been served by the Business Concierge, generating 654 hours of custom research and referrals. 50 bloggers have been registered at SpeakOutSmallBusiness and the statewide small business survey is being drafted.						
Plans	Advance Iowa will work to collect ongoing economic impact from initial participants and serve an additional 20-25 stage II companies by year end. The statewide pitch off for DBGH will be held in May as part of the statewide Fest! Conference in downtown Iowa City. New webinar partners will be sought and attendance will continue to grow among small companies. The Business Concierge will implement a marketing strategy to raise awareness of the services available in the spring of 2014. SpeakOutSmallBusiness will be re-evaluated for acceptance among Iowa small business owners and the statewide survey will be completed and results distributed among key stakeholders.						

University of Northern Iowa	Project	List of all FY 2014 Revenue Sources	5991 Revenue Dollars for FY 2014	Amount Expended as of 12/31/2013	List of all FY 2014 Revenue Sources	5991 Revenue Dollars For FY 2014	Amount of FY 2014 Regents Appropriations Expended as of 6/30/2014
2	**Technology Transfer, Business Incubation and Additive Manufacturing**	FY 2014 Regents Appropriations (ISWJCF)	$475,000	$158,059	FY 2014 Regents Appropriations (ISWJCF)	$475,000	
		FY 2014 Federal Support			FY 2014 Federal Support		
		FY 2014 Other		259,702	FY 2014 Other		
Description of Project	UNI continues to advance intellectual property disclosures, protection and commercialization across campus. Strategies for commercialization include licensing, strategic partnerships and new business development. The Innovation Incubator has created a hub facility, coalescing the existing strength of Intellectual Property disclosures, mobile applications and University research with quality business services to support business incubation and growth. The incubator and support facilities offer a physical link between the Iowa business community, campus innovators and faculty researchers to enhance technology transfer. UNI will be forging a formal agreement with the ISU Research Foundation to assist and guide commercialization activities and starting discussions with the University of Iowa Research Foundation. Additive manufacturing will also be supported with rapid castings technology.						
Anticipated End Results	UNI expects ten disclosures, two patent applications and two license agreements. UNI's incubator will remain full and graduate 4-5 businesses into the regional economy and launch 15 student businesses in the JPEC student Business Incubator. Seven late stage faculty research projects will also be assisted. Formal agreements with ISURF and UIRF will be completed. A mobile development applications lab (Apps Lab) will be launched in the John Pappajohn Entrepreneurial Center. Faculty and students will be assisted to develop apps with commercial potential. Additive manufacturing is also a priority for FY 14, which will include installation of a 3D printer to promote rapid castings technologies.						
Results Achieved to Date	During the first part of FY 2014, 4 disclosures were received with 3 moving toward commercialization. Four faculty research grants were awarded for early-stage research with commercial potential. UNI has begun active collaboration with the ISU Research Foundation, receiving due diligence technical assistance on three technologies. The Innovation Incubator is full and three companies have recently graduated into the regional economy with one of the companies a former tenant in the Student Business Incubator. The Innovation Incubator conducted a regional BarCamp event, which attracted more than 100 participants to the incubator and led a joint Cedar Valley/UNI Small Business Expo with the announcement of the Regional Dream Big Grow Here winner. Another faculty spin-off was started in the past 6 months . The Apps Lab has been launched with one App already for sale on Apple© and Android© devices and other Apps are being developed.						
Plans	UNI will continue to focus on commercialization initiatives, including license negotiations and business startups. At least ten intellectual property disclosures will be received with two licensing agreements executed under patent or trade-secret provisions and UNI will conduct a faculty research grant competition. In addition, the Student Business Incubator and Innovation Incubator will remain full, generating spin-off companies for the Iowa economy. UNI will also expand its corporate research and development program to assist existing businesses in Iowa.						

University of Northern Iowa	Project	List of all FY 2014 Revenue Sources	5992 Revenue Dollars for FY 2014	Amount Expended as of 12/31/2013	List of all FY 2014 Revenue Sources	5992 Revenue Dollars For FY 2014	Amount of FY 2014 Regents Appropriations Expended as of 6/30/2014
3	**Regional Development**	FY 2014 Regents Appropriations (ISWJCF)	$125,000	67,317	FY 2014 Regents Appropriations (ISWJCF)	$125,000	
		FY 2014 Federal Support		13,470	FY 2014 Federal Support		
		FY 2014 Other		54,385	FY 2014 Other		
Description of Project	IDM will lead an effort to assess and structure Iowa's regions for economic growth. This will include asset mapping to determine regional strengths and linkages and thereby outline the most appropriate regional boundaries. In partnership with the Iowa Economic Development Authority (IEDA), Regent universities, community colleges, utilities, Professional Developers of Iowa (PDI) and the Iowa Department of Education, IDM will enhance the Business Expansion & Strategic Trends (BEST) of Iowa program and support regional development across Iowa.						
Anticipated End Results	Lead the process of reorganizing Iowa's Regions, focusing on mapping regional strengths and linkages, propose new regional boundaries and suggest best practices for overall structure and leadership. Outline key benefits of regional development and assist Professional Developers of Iowa with communications and implementation. Support regional economic development groups with planning, targeting and marketing guidance. Launch entrepreneurial regions projects in two regions in Iowa.						
Results Achieved to Date	IDM has helped organize Regionalism 2.0 and conducted multiple planning meetings with PDI and steering committee members. IDM worked with a Geography Department professor to outline new regional boundary options for Iowa and have narrowed options to either 6 or 9 regions. IDM also worked with IWD to complete regional asset maps for four regions. In addition, IDM partnered with utility companies and economic development service providers to update the Synchronist existing industry survey and helped local development organizations conduct more effective existing industry programs. Entrepreneurial community projects were launched in two regions to integrate entrepreneurship into the regional economy and an EDA University Center grant has been received to enhance our entrepreneurial communities assistance.						
Plans	IDM will lead the process for developing a new set of economic boundaries to help restructure and reenergize regions across the state and engage the economic development profession in the process. IDM will continue supporting regional targeting, marketing, organizational management and planning efforts as requested. Regional entrepreneurial communities projects will be launched in two regions in Iowa. IDM will participate in the Business Expansion and Strategic Trends (BEST) of Iowa program and expand the Entrepreneurial Communities Project to enhance and increase entrepreneurship initiatives in regional economic development. Working with the BEST of Iowa Partnership, IDM will enhance the data collection and analysis process.						

University of Northern Iowa	Project	List of all FY 2014 Revenue Sources	5990 Revenue Dollars for FY 2014	Amount Expended as of 12/31/2013	List of all FY 2014 Revenue Sources	5990 Revenue Dollars For FY 2014	Amount of FY 2014 Regents Appropriations Expended as of 6/30/2014
4	**Competitive and Market Intelligence**	FY 2014 Regents Appropriations (ISWJCF)	$100,000	53,373.50	FY 2014 Regents Appropriations (ISWJCF)	$100,000	
		FY 2014 Federal Support			FY 2014 Federal Support		
		FY 2014 Other		68,474.99	FY 2014 Other		
Description of Project	Strategic Marketing Services (SMS) will develop and manage a competitive and market intelligence program for mid-sized Iowa companies. The purpose of devoting ISWJCF investments to competitive and market intelligence projects is to expand economic growth across Iowa by stimulating business expansion opportunities. Accurate information is needed to make sound market entry or expansion decisions. Gathering and using data to make decisions is what SMS provides. Established businesses will be required to pay at least one-half of their project cost. SMS expects to assist at least five Iowa companies with advanced competitive and market intelligence projects. Priority will be given to businesses in the state's target industry clusters.						
Anticipated End Results	SMS will complete five competitive intelligence projects to expand market share, increase profitability and expand the workforce and market research projects for smaller Iowa companies and new startups and conduct five market feasibility assessments for technology transfer.						
Results Achieved to Date	So far this year, SMS has used ISWJCF dollars to provide market research services to the following Iowa companies: Accumold in Ankeny; Recycle Rite in Cedar Falls; J&J in Cedar Falls; VGM in Waterloo; Difference Collaborative in Cedar Falls.						
Plans	SMS will continue to consult with Iowa businesses, entrepreneurs, statewide associations and local governments to conduct competitive intelligence and develop market research plans. In some cases, the client may wish to undertake some or all of the research activities on their own, utilizing the market research plan as a guide. The final piece of competitive and market intelligence assistance will be devoted to phase one market research feasibility assessments for the technology transfer process.						

Drake University	**Award**	**$ 112,000.00**	**Budgeted Match**	**$ 250,000.00**	**Project Budget**	**$ 362,000.00**
Total GIVF Reimbursements Approved:		$111,997.60	**Reported Match:**	$250,000.00	**Project Total**	$361,997.60

Expenses Submitted

Date Submitted	Amount Requested	Amount Approved	Date Approved
02/13/12	$1,120.70	$1,120.70	11/10/11
04/10/12	$1,050.01	$1,050.01	04/10/12
06/18/12	$54,880.41	$54,880.41	06/18/12
08/13/12	$3,525.31	$3,525.31	08/13/12
08/15/12	$5,482.68	$5,482.68	11/13/12
11/13/12	$15,432.21	$15,432.21	11/13/12
1/25/2013	$30,506.28	$30,506.28	1/25/2013

Match Funds Reported

Date Reported	Match Amount
2/15/2012	$ 250,000.00

Reporting Period	Total Reported
	$251,120.70
	$1,050.01
	$54,880.41
	$3,525.31
	$5,482.68
	$15,432.21
	$30,506.28
Total Reported	**$361,997.60**

Completed renovation of the laboratory space to be used for the expansion of the Pharmacogenomics Teaching and Research Laboratory.
Technology for research and student training with protein samples prepared from cells grown in the tissue culture laboratory will be used to train students in identification of biomarkes.
Leveraging out new laboratories for promoting Science, Technology, Engineering and Math (STEM) education is one of our long term goals.

Luther College

Award	$	40,000.00	Budgeted Match	$	89,044.00	Project Budget	$	129,044.00
Total GIVF Reimbursements Approved:		$40,000.00	**Reported Match:**		$0.00	**Project Total**	$	40,000.00

Expenses Submitted

Date Submitted	Amount Requested	Amount Approved	Date Approved
07/21/11	$8,884.60	$8,884.60	07/21/11
10/27/11	$10,204.46	$10,204.46	10/31/11
01/27/11	$4.67	$4.67	02/01/12
04/20/12	$112.46	$112.46	04/20/12
07/24/12	$20,793.81	$20,793.81	07/24/12

Match Funds Reported

Date Reported	Match Amount	Reporting Period	Total Reported
			$8,884.60
			$10,204.46
			$4.67
			$112.46
			$20,793.81
		Total Reported	**$ 40,000.00**

Research to develop two new classes of corn-based plastics using corn cobs and dehydration of high fructose corn syrup.

Central College

Award	**$ 10,000.00**	**Budgeted Match**	**$ 23,041.00**	**Project Budget**	$ 33,041.00
Total GIVF Reimbursements Approved:	$10,000.00	**Reported Match:**	$0.00	**Project Total**	$ 10,000.00

Expenses Submitted

Date Submitted	Amount Requested	Amount Approved	Date Approved
11/07/12	$1,722.40	$1,722.40	11/07/12
02/06/13	$202.16	$202.16	02/06/13
03/05/13	$441.45	$441.45	03/05/13
04/18/13	$523.91	$523.91	04/18/13
05/06/13	$520.99	$520.99	05/06/13
06/07/13	$4,171.46	$4,171.46	06/07/13
07/09/13	$1,022.50	$1,022.50	07/09/13
08/15/13	$1,395.13	$1,395.13	08/15/13

Match Funds Reported

Date Reported	Match Amount	Reporting Period	Total Reported
			$1,722.40
			$202.16
			$441.45
			$523.91
			$520.99
			$4,171.46
			$1,022.50
			$1,395.13
		Total Reported	**$10,000.00**

Mix of species of prairie plants on 14 acre site to determine which specific mixes of pairie plants provide the mos biomass for fuel production while simultaneously producing the most agricultural and environmental benefits.
The site will be used for demonstration, to inform agricultural producers, business people, government officals and the public on the potentilal of prairies.

Grand View University

Award	**$**	**50,000.00**	**Budgeted Match**	**$**	**60,763.00**	**Project Budget**	**$ 110,763.00**
Total GIVF Reimbursements Approved:		$50,000.00	**Reported Match:**		$50,059.04	**Project Total**	$ 100,059.04

Expenses Submitted

Date Submitted	Amount Requested	Amount Approved	Date Approved
06/06/12	$49,940.96	$49,940.96	06/06/12
01/23/13	$59.04	$59.04	01/23/13

Match Funds Reported

Date Reported	Match Amount
8/13/2012	$50,000.00
01/23/13	$59.04

Reporting Period	Total Reported
	$99,940.96
	$118.08
Total Reported	**$ 100,059.04**

Synthesized glucose-4-phosphate. Currently working on optimizing the synthesis so that we may be able to synthesize gram quantities.
Research has moved forward on the discovery of family of compounds capable of treating diabetes.