11-TTAG-007

Company Name	Vegrandis, LLC
NAICS	541710
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City	Fayetteville
State	AR
ZIP	72701
County	Washington
Number of Employees	16
Year Established	2002
Company Web Site	http://www.vegrandis.com
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Project Area	Advanced Materials and Manufacturing Systems - 4 - Other Advanced Materials and Manufacturing Systems (Please Provide short description in box provided below)
Project Area Brief Description	Carbon Nanopipette based Electrochemical Sensor Array for High Throughput Detection
Federal Agency	U.S. Department of Health and Human Services
Project Title	11-TTAG-007 - Carbon Nanopipette based Electrochemical Sensor Array for High Throughput Detection
Competitive Challenges	Vegrandis is a market-focused leader in microelectrochemical detection and carbon nanopipette applications. The company designs and builds nanoelectrochemical detection based point-of-care clinical assays, chemical/biological sensors, microarrays, laboratories-on-a-chip, reagent kits, and also carbon nanopipettes for cell electrophysiology and cellular injection applications. Vegrandis is committed to meet the needs of environmental monitoring, point-of-care diagnostics, bioterrorism defense and intracellular nanosurgery with disposable devices and inexpensive, easy to use instrumentation that accelerates analyses while reducing laboratory costs.
Specific Problem	NIH N5: Nanoinstrumentation
Solution	This SBIR Phase I project is to demonstrate the feasibility for fabrication of a nanoelectrode sensor array based on uniquely designed and fabricated hollow carbon nanopipettes (CNPs). The CNPs can be used to inject fluids down to femtoliter volumes and simultaneously measure electrochemical currents. They can also be used for many other applications and allow researchers to unshackle the experimental limitations imposed on them by current micro electrodes and micropipettes. Vegrandis will fabricate an array of CNP nanoelectrodes that is capable of detecting multiple samples using standard well plates. Previous work demonstrated that the CNPs do not foul easily, are robust and can be readily reused with a simple clean up step. The ultimate goal is to develop an assay platform compromising Vegrandis' existing multi channel electrochemical analyzer in combination with a new fluidic control system designed to interface with the CNPs. The fabrication of CNPs with counter electrodes (CNPEs) will also be explored. The CNPEs will allow a

	unique self-contained two electrode configuration for ease of use in many small volume electrochemical applications.
Implementation Plan	the main goal of Phase I is to develop a prototype CNP based electrochemical sensor array and to explore the feasibility to transfer the existing CNP fabrication process to enable production of CNPs at a commercial scale. The prototype CNP sensor array will be capable of injecting small volumes into microwells in a multi-well plate and concurrently generating electrochemical signals (to be explored in Phase II). Multi electrode CNPs (CNPEs) that can serve as a two electrode system in a single CNP will also be developed by coating electrode materials on the outer wall of the quartz or glass capillary that is used to fabricate the CNP. CNP and CNPE arrays will be fabricated that can perform as small volume injectors and nano-electrodes in a single device. In the Phase I feasibility studies, the CNP electrochemical sensor array will be tested for sensitive and high throughput electrochemical detection using a simple model analyte, mouse IgG.
Maintenance Plan	The proposed project has broad implications for basic scientific knowledge and technical advances. Obtaining any Federal Regularity, partnering with manufacturing to help produce the product and commercially seek investment funding.
Step 1	Prepatory Work - Define Research Objectives - Outline Proposal - Discussions with funding agency - Literature search and review -Identification of potential users and partners
Step 1 Time	20.00
Step 1 Budget	$1,000
Step 2	Proposal Content Development - Technology description and significance - work plan development - Budget Development - Commercialization Plan
Step 2 Time	25.00
Step 2 Budget	$1,250
Step 3	Final Proposal Preparation - Proposal Review - Formatting and Proofreading - Letters of Support, consultant letters - Agency forms - Cover letters, copies, mailing
Step 3 Time	30.00
Step 3 Budget	$2,750
Increased Sales	$0

Retained Sales	$0
CS Inventory	$0
CS Labor	$0
CS Materials	$0
CS Other	$0
II Plant	$0
II IS	$0
II Workforce	$0
II Research	$150,000
II Other	$0
AUI	$0
SOI	$0
Job Retention	1
Job Creation	1
YN 90Days	No
YN Affiliation	Yes
YN Agreement	Yes
YN Total Project Price	Yes
Explain Total Project Price	
YN Cash Match Agreement	Yes
Copied	No
TTAG ID	11-TTAG-007
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Include in Batch	Yes
Batch Number	NA
Application Status	Pending
Organization	ASTA
BatchTest	Processed
Batch Date	
Set Batch Number	
Lvl4	No
Application Description	6-Advanced Materials & Production
SBIR-STTR	Yes