Cover Sheet

2016 InnovateHER Business Challenge
Pitch Competition December 2, 2015 6:00PM
8 Participants

Host location:

Landing Zone, LLC
625 Celeste Street
New Orleans, LA 70130
POC—Jennifer Talley
504.509.4420
jennifer@lznola.org

Host location winner:

Name of the winning individual: Nicholas Pashos
Company Name : BioAesthetics
Company address: 318 Lake Marina Drive, unit 105, New Orleans, LA 70124
Place of incorporation (if applicable): New Orleans, LA
Product or service website: www.bio-aesthetics.com
Telephone number of winning individual: 603.714.8491
Email address of winning individual: npashos@tulane.edu

BioAesthetics is improving reconstruction options for breast cancer patients after they undergo mastectomies. These women have several options for nipple-areolar complex (NAC) reconstruction, including surgery, tattoos, and prosthetics, but the success of these procedures is variable and some are not permanent; BioAesthetics has developed a graft that would instead allow the patient's body to regenerate a permanent NAC.

Statement of Support

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After hearing all of the 8 contestants pitch, and with careful consideration of each presentation, we selected BioAesthetics as our location winner on the basis of its well-considered business plan and its potential impact on the lives of women and their families. In particular, we were taken with the project's innovative approach to the problem of nipple reconstruction post-mastectomy. Current nipple reconstruction technologies are nowhere near as effective and integrated as BioAesthetics' patented technology. If the technology is successful, it will help breast cancer survivors regain some of the dignity and self-esteem lost while going through the treatment and reconstructive surgeries associated with breast cancer. During his pitch, Nicholas pointed out that this technology will also be able to be applied to other surgeries and procedures with further research and testing. Given their careful planning, we are confident that the business will be as successful as the technology.

We are proud to submit and support Nicholas and BioAesthetics as our location winner and hope he is given the opportunity to compete in the National Competition in Washington D.C..

Sincerely,

Jennifer Talley
Leasing/Event Manager
Landing Zone, LLC
504.509.4420
jennifer@lznola.org
www.lznola.org

Nicholas C. Pashos

318 Lake Marina Drive, #105 • New Orleans, LA 70124
1.603.714.8491• npashos@tulane.edu

EDUCATION

Tulane University; School of Science and Engineering — New Orleans, LA
Ph.D. Candidate (in progress): Bioinnovation — 2012-current

Drexel University; School of Biomedical Engineering, Science & Health Systems — Philadelphia, PA
Bachelor of Science: Biomedical Engineering — June, 2011
Concentration: Biomaterials and Tissue Engineering

RESEARCH EXPERIENCE

Tulane University; Center for Stem Cell Research and Regenerative Medicine — New Orleans, LA
Graduate Student / NSF IGERT Fellow — Aug, 2012 to present

- •Development and optimization of the generation and cellularization of biologically derived biocompatible whole Nipple—Areolar Complex (NAC) scaffolds for application in total NAC regeneration. Cultured, expanded, and utilized bone-marrow and adipose derived stem cells, and keratinocytes, from human and rhesus macaque to experimentally reconstitute the NAC scaffolds that provide a bioactive cell attachment surface onto which cells were able attach and be cultured under dynamic cell culture conditions.

Massachusetts General Hospital; Department of Neurology — Boston, MA
Research Technician II — Sept, 2011 to July 2012

- •Evaluation of potential biomarkers for Huntington's Disease in blood Buffy Coats and plasma. Assist in troubleshooting of ELISAs and optimization of assay parameters. Frequent mathematical analysis of collected data using Prism and trained on Alpha Technology based sandwich immunoassays.

Drexel University; School of Biomedical Engineering, Science & Health Systems — Philadelphia, PA
Undergraduate Research Assistant/Student Tackling Advanced Research (STAR) Scholar — June, 2007 to June, 2011

- •Production of scaffolds for encapsulation of genetically engineered fibroblasts expressing neurotrophic factors in biocompatible and biodegradable hydrogels for the repair of spinal cord injury. After implantation of encapsulated cells in mice, we demonstrated sustained release from scaffold of the neurotrophic factors. Also, maintained fibroblast cell cultures and conducted Live/Dead cell viability assays.
- •Senior Design Project: Scaffold development via freeze-casting of biocompatible and biodegradable hydrogel for guided neurite growth. *In vitro* assessment of the guided neurite growth was performed with whole dorsal root ganglia (DRG) isolated from chicken embryos. Immunofluorescence was performed for evaluation of neurite extension of DRG studies.

University of Crete, School of Medicine — Heraklion, Crete, Greece
Undergraduate Research Intern/ Vidalakis Cretan Scholar — April, 2009 to Sept, 2009

- • Assisted in analysis of the intramuscular fatty acid content of meat products and assessed nutritional and dietary means of altering the fat content.

Drexel University College of Medicine — Philadelphia, PA
Summer Undergraduate Research Fellow — June, 2008 to Sept, 2008

- •Expressed and purified a novel antiemetic for the treatment of chemotherapy induced nausea and Post-Operative Nausea and Vomiting (PONV). Performed the subcloning of the conotoxin for the production of N-terminal fusions to different leader sequences that would mediate secretion of the protein in the periplasm. Also performed a large scale production of the recombinant protein, purified it by immobilized metal affinity chromatography and assessed its solubility.

PATENT S

Pashos, Nicholas C., and Bunnell, Bruce A. "Surgical grafts for replacing the nipple and areola or damaged epidermis" PCT/US2015/058527. Tulane University, assignee. PCT Patent Application. 2015

Pashos, Nicholas C., and Bunnell, Bruce A. "A biocompatible device for nipple and areola replacement." 62/212,846. Tulane University, assignee. Provisional Patent Application. 2015

Pashos, Nicholas C., and Bunnell, Bruce A. "A biocompatible device for nipple and areola replacement." 62/073,719. Tulane University, assignee. Provisional Patent Application. 2014

Pashos, Nicholas C., and Dashti C. Derek. "An Apparatus For The Application Of Lubricants And Methods Of Use For The Same." 61/901,576. Tulane University, assignee. Provisional Patent. 2014.

PUBLICATIONS

Nicholas C. Pashos, Michelle E. Scarritt, Zachary R. Eagle, Jeffery M. Gimble, Abigail Chaffin, Bruce A. Bunnell, "A Tissue Engineering Approach to Nipple—Areolar Complex Reconstruction," *Plastic and Reconstructive Surgery* (Submitted 2015)

Michelle E. Scarritt, **Nicholas C. Pashos,** Jessica M. Motherwell, Zachary R. Eagle, Brian J. Burkett, Ashley N. Gregory, Ricardo Mostany, Daniel J. Weiss, Diego F. Alvarez, and Bruce A. Bunnell, "Vascular Recellularization Of Rat Lung Scaffolds Requires Passive Gravity Perfusion Of Segment Specific Pulmonary Endothelial Cells" *Science Translational Medicine* (Submitted 2015)

Ryan W. Bonvillain, Michelle E. Scarritt, **Nicholas C. Pashos**, Deborah E. Sullivan, Aline M. Betancourt, Fern Tsien, Ayesha P. Umrigar, and Bruce A. Bunnell, "Rhesus Macaque Lungs Harbor Tissue-resident Multipotent Mesenchymal Stromal Cells That Are Capable of Growth On Decellularized Rhesus Lung Scaffolds: Implications for a Pre-clinical Non-human Primate Model for Pulmonary Tissue Engineering" *Cell and Gene Therapy Insights* (Submitted 2015)

Michelle E. Scarritt, **Nicholas C. Pashos** and Bruce A. Bunnell. "A Review Of Cellularization Strategies For Tissue Engineering Of Whole Organs." *Front. Bioeng. Biotechnol,*.Feb. 2015

Ryan W. Bonvillain, Michelle E. Scarritt, **Nicholas C. Pashos**, Jacques P. Mayeux, Christopher L. Meshberger, Aline M. Betancourt, Deborah E. Sullivan, and Bruce A. Bunnell. "Non-human Primate Lung Decellularization and Recellularization Using a Specialized Large-organ Bioreactor." *J. Vis. Exp.* In Press 2013

Shanbhag, Mihir S., Justin D. Lathia, Mohamed R. Mugha, Nicola L. Francis, **Nicholas Pashos**, Mark P. Mattson, and Margaret A. Wheatley. "Neural Progenitor Cells Grown on Hydrogel Surfaces Respond to the Product of the Transgene of Encapsulated Genetically Engineered Fibroblasts." *Biomacromolecules*. Nov. 2010.

RESEARCH HONORS AND AWARDS

- *Innovation-CORPS Grant Recipient,* National Science Foundation (**NSF**); $50,000 2015
- *BioChallenge, First Place,* New Orleans BioInnovation Center 2015
- *Novel Technology Challenge, semi-finalist award,* Technology Transfer Office; Tulane University 2015
- *Novel Technology Challenge, semi-finalist award,* Technology Transfer Office; Tulane University 2014
- *Stage 1 E-Team Program Grant Recipient;* VentureWell (Formally NCIIA) 2014
- *Special Recognition for Outstanding Contributions to Post Market Surveillance,* Food and Drug Administration (**FDA**), Office of Surveillance and Biometrics 2013
- *Integrative Graduate Education and Research Traineeship (IGERT) Fellowship*; **NSF**; Tulane University 2012-current
- *Innovation and Partnership Award,* School of Biomedical Engineering; Drexel University 2011
- *First Place, Senior Design Competition*, School of Biomedical Engineering; Drexel University 2011
- *First Place, Research Poster Competition*; ISPE, Delaware Valley Pharmaceutical meeting 2010
- *Vidalakis Cretan Scholars Award*; Drexel University 2009
- *Biomedical Engineering Research Abroad Award*; School of Biomedical Engineering, Drexel University 2009
- *Honorable Mention; Discovery Day Poster Competition*, Drexel University College of Medicine 2008
- *Summer Undergraduate Research Fellowship (SURF),* Drexel University College of Medicine 2008
- *Outstanding Student Service Award*; School of Biomedical Engineering; Drexel University 2008
- *Students Tackling Advanced Research (STAR) Scholar*, Pennoni Honors College, Drexel University 2007

POSTER PRESENTATIONS

Pashos N, Scarritt, M, Chaffin, A, Gimble, J., Bunnell, B., "A Tissue Engineered Nipple—Areolar Complex,"
American Society of Gene & Cell Therapy, **New Orleans, LA** May, 2015
Engineering and Regenerative Medicine International Society, World Congress **Boston, MA** Sept, 2015
Gulf Coast Intellectual Property Association; Infinity Science Center at Stennis **Pearlington, MS** Nov, 2015

Pashos N, Dashti, D, Karolina K, Bonvillian R, Betancourt A, Bunnell B "Regenerating Organs Using Stem Cells and Biomaterials". *NSF, IGERT National Research Competition,* **IGERT.org** April, 2013

Pashos N, Boldt M, Kain M, Neafsey J, McGath J. Francis N, Wegst U. Wheatley M "Freeze-cast of Biodegradable and Biocompatible Hydrogel for Guided Neurite Growth" *Northeast Bioengineering Conference*, **Troy, NY** April, 2011

Pashos N, Shanbhag M, Wheatley M.; "Mechanical Properties of Biodegradable and Biocompatible Hydrogel Scaffolds"
International Society of Pharmaceutical Engineers, Delaware Valley Exhibition **Philadelphia, PA** Feb, 2011
International Society of Pharmaceutical Engineers, Annual Meeting **Orlando, FL** Nov, 2010
International Society of Pharmaceutical Engineers, Delaware Valley Chapter **Philadelphia, PA** April, 2010
Posters on the Hill: Council of Undergraduate Research/American Chemical Society **Washington, D.C.** April, 2009
*1 of the 60 undergraduate students nationally selected for participation