Jed Johnson, J Cell Sci Ther 2012, 3:8
http://dx.doi.org/10.4172/2157-7013.S1.019

OMICS Group Conferences
Accelerating Scientific Discovery

2nd World Congress on
Cell Science & Stem Cell Research

November 12-14, 2012 Hilton San Antonio Airport, USA

Reverse engineering organs for the realization of tissue engineering

Jed Johnson
Nanofiber Solutions, USA

There is a tremendous loss of human life every year due to cancer and end-stage organ failure. The demand for donor organs is severely limited and will continue to grow as our population increases. Even when suitable donors are found, the risk of transplant host rejection is prohibitively high. Using synthetic nanofiber scaffolds to create artificial organs is a practical solution to the host of problems listed above. Seeding these scaffolds with appropriate biological sources, such as patient stem cells, results in fully functional organs that bypass organ availability and host compatibility issues. Recently, we successfully created an artificial trachea made from polyester nanofibers for implantation into a patient suffering from tracheal cancer at the Karolinska Institutet with Paolo Macchiarini. In this procedure, mononuclear cells were isolated from the patient's bone marrow and cultured on the nanofiber scaffold for two days in a custom made bioreactor. The distal 6cm of the patient's trachea, including both bronchi, were then removed and replaced with the artificial trachea. There are additional surgeries scheduled for Russia and the US in spring 2012. This event only begins to reveal the potential of synthetic nanofibers to transform the field of regenerative medicine and dramatically improve patient care. Nanofiber scaffolds provide the required physical structure and mechanical support to cells, allowing them to grow in an environment that closely mimics the native tissue. Future work includes reverse engineering the physical structure of the intestines and esophagus for similar translational, life-saving efforts

Biography

Jed Johnson completed his Ph.D at The Ohio State University in the field of Materials Science and Engineering. He founded Nanofiber Solutions in 2009 as a university spin-off company focused on the development of 3D cell culture dishes for enhanced cancer and stem cell research, and the company is now actively involved in clinical tissue engineering. He has published more than 15 papers in peer-reviewed journals, served as PI on numerous SBIR/STTR grants, and is currently leading his company through strategic investments

jed.johnson@nanofibersolutions.com