



PRESS RELEASE

METHUSELAH FOUNDATION ANNOUNCES \$1 MILLION “NEW ORGAN LIVER PRIZE” IN TISSUE ENGINEERING

12/5/2013

SAN DIEGO — Methuselah Foundation, a medical charity based in Springfield, VA, announced today at the World Stem Cell Summit in San Diego the official launch of the \$1 million New Organ Liver Prize (www.neworgan.org), a five-year international competition to advance the field of tissue engineering and regenerative medicine.

The New Organ Liver Prize is the first in a series of whole organ challenges and awards designed to help solve the global organ shortage, which affects millions of people around the world. There are presently over 120,000 on the organ wait list in the U.S alone, many of whom will die before finding a compatible donor. Even those fortunate enough to receive an organ in time face ongoing medical difficulties, often for the rest of their lives.

New prospects for whole organ regeneration, engineering, and preservation offer potentially powerful solutions to this health crisis, but tissue engineering research is currently underfunded, receiving less than \$500 million annually in the U.S. compared to \$5 billion for cancer and \$2.8 billion for HIV/AIDS. Neither the NIH nor the NSF provide significant funding for whole organ tissue engineering, and the field also suffers from difficult regulatory hurdles as well as broader shortfalls in biotechnology investment for pre-clinical research.

Methuselah Foundation CEO David Gobel commented, “Regenerative medicine is the future of health care, but right now the field is falling through the cracks. The New Organ Liver Prize is a celebration of how far we’ve come in organ transplantation to date, and a rallying flag to mobilize the funding and attention required to take it to the next level.”

Bernard Siegel, founder and co-chair of the World Stem Cell Summit and executive director of the Genetics Policy Institute (GPI), said, “Growing a whole, healthy organ is one of the ultimate goals of regenerative medicine. The world stem cell community enthusiastically supports the ambitious aim of the Methuselah Foundation in launching the New Organ Liver Prize and the mobilization of this competitive challenge for researchers to cure disease and alleviate human suffering through tissue engineering.”

New Organ has been endorsed by prominent doctors and scientists across the field of regenerative medicine, including Dr. Anthony Atala of Wake Forest, Dr. Stephen Badylak of the University of Pittsburgh, and the Founding Fellows of TERMIS (Tissue Engineering and Regenerative Medicine International Society).

“Regenerative medicine and tissue engineering are at the cusp of conquering the final frontier, the fabrication of vital organs to definitively solve the organ donor shortage,” said Dr. Joseph Vacanti of



Massachusetts General Hospital. “New Organ will help catalyze the efforts to solve the remaining problems to bring this life saving technology to all of the people who desperately need it.”

Incentive prizes can be powerful levers for raising the visibility and prestige of scientists working in new areas of research. Prizes have helped launch entire industries in the past, such as the Orteig Prize won by Charles Lindbergh in 1927, which transformed U.S. aviation. They are known for attracting new capital to difficult problems, motivating top minds as well as non-traditional players, accelerating timelines of discovery, forcing regulatory reform, and galvanizing public demand.

Due to the complexity of defining strong competition criteria for each of the solid organs, including the heart, kidney, and lungs, this prize will focus exclusively on tissue engineering solutions that replace the liver. Ultimately, the Methuselah Foundation intends to develop a prize series that covers all of the major solid organs, and that spans multiple strategies, including organ regeneration, repair, replacement, and preservation. Through its New Organ Alliance, Methuselah also hopes to mobilize other granting institutions to allocate additional funds in support of teams competing for the prize.

About Methuselah Foundation

The Methuselah Foundation is a medical charity working to advance the field of regenerative medicine in order to extend healthy life. By fostering disruptive developments in biomedical engineering, it seeks to build a world where 90 year-olds can be as healthy as 50 year-olds, by 2030. Learn more at www.methuselahfoundation.org and www.neworgan.org.

About World Stem Cell Summit

The World Stem Cell Summit is the flagship meeting of the international stem cell community. The Summit aims to accelerate the discovery and development of lifesaving cures and therapies, bringing global stakeholders together to solve global challenges. It builds a foundation to advance cell therapies by establishing a supportive environment of regulation, legislation, financing, reimbursement, and patient advocacy. The 2013 World Stem Cell Summit will be held at the Manchester Grand Hyatt San Diego, in San Diego, CA, December 4-6, 2013. It is presented by Genetics Policy Institute GPI and is co-organized by the California Institute for Regenerative Medicine, Mayo Clinic, Scripps Research Institute, Sanford-Burnham Medical Research Institute, and Kyoto University Institute for Integrated Cell-Material Sciences (iCeMS). For more information, visit www.worldstemcellsummit.com.

CONTACT:

Florina Linco, Community Director, Methuselah Foundation, (206) 643-8175,
florina.linco@neworgan.org

###



FACT SHEET

For more information, visit www.neworgan.org or contact **Florina Linco**, Methuselah Foundation Community Director, at (206) 643-8175 or florina.linco@neworgan.org.

Available for interview:

To arrange an interview with **Lee Downing**, liver transplant recipient, 25-year organ donation advocate, and New Organ supporter, contact leedowning8@msn.com.

To arrange an interview with any of the following experts in regenerative medicine, all of whom have agreed to speak with journalists about New Organ, email Florina Linco or contact them directly.

Dr. Stephen Badylak

badysx@upmc.edu, (412) 624-5253

Professor, Department of Surgery, University of Pittsburgh
Deputy Director, McGowan Institute for Regenerative Medicine

Dr. Sangeeta Bhatia

sbhatia@mit.edu, (617) 324-0610

Director, Laboratory for Multiscale Regenerative Technologies, MIT

Dr. Valerie Gouon-Evans

valerie.gouon-evans@mssm.edu, (212) 241-4033

Assistant Professor, Mount Sinai School of Medicine

Dr. Robert Langer

rlanger@mit.edu, (617) 253-3107

David H. Koch Institute Professor, MIT

Dr. Chris Mason

chris.mason@ucl.ac.uk, +44 207 679 0140

Professor, Advanced Centre for Biochemical Engineering, University College London

Dr. Joseph Vacanti

jvacanti@partners.org, (617) 724-1725

Surgeon-in-Chief, Massachusetts General Hospital for Children
Director, Laboratory for Tissue Engineering and Organ Fabrication, Mass General

Dr. William Wagner

wagnerwr@upmc.edu, (412) 624-5327

Professor of Surgery, University of Pittsburgh
Director, McGowan Institute for Regenerative Medicine



Citations:

Waiting list size and number of transplants performed in U.S. from Jan-Aug 2013: [UNOS](#)
Funding for cancer research and HIV/AIDS research: [National Cancer Institute](#) and [AIDS.gov](#)

Key developments in tissue engineering:

Liver:

At Yokohama City University in Japan, Dr. Takebe and colleagues [constructed tiny 'liver buds'](#) from three different cell types. When transplanted into a mouse on the verge of liver failure, the organoids connected to the host's blood vessels, enabling the cells to proliferate and perform liver functions.

In addition, Dr. Eric Lagasse has grown thriving [mini-livers](#) by incubating healthy liver cells inside the lymph nodes of live mice with liver disease. These tiny organs share some functions with full livers.

Lab grown bladders:

Dr. Anthony Atala and colleagues at the Wake Forest Institute for Regenerative Medicine have grown and transplanted bladders created from the cells of children and teenagers with congenital birth defects, such as Luke Massella, who was 10 years old at the time and is now a healthy college graduate.

Synthetic windpipes:

Dr. Paolo Macchiarini and colleagues have [transplanted tracheas](#) successfully for multiple patients, creating them each time from a patient's cells to avoid rejection and immunosuppression.

3D bioprinting:

Biotech startup [Organovo](#) prints cells in a scaffold to create three-dimensional shapes. They have achieved success with synthetic blood vessels and miniaturized cellular 3D human liver tissue.

Muscle regeneration:

Dr. Stephen Badylak and colleagues at the McGowan Institute have developed scaffolds that signal the body to harness its own repair mechanisms. As part of an early study, Afghanistan veteran [Sergeant Ronald Strang was able to regrow new leg muscle](#) to replace the muscle lost from a roadside bomb.

Heart:

At the University of Minnesota Dr. Doris Taylor led the creation of organ scaffolds from [decellularized human hearts](#). The structures were seeded with adult stem cells and regrown to share characteristics with functioning hearts, including beating at the speed of a resting heart rate.

Lungs:

At Yale University Dr. Laura Niklason and colleagues cultured [lung tissue](#) in the laboratory using an extracellular matrix. The tissue functioned for nearly two hours once it was transplanted into a live rat.

Kidney:

Dr. Harold Ott and colleagues have [grown rat kidneys](#) by seeding decellularized kidney scaffolds. These



bioengineered organs were transplanted into rats and successfully produced urine while also showing 5% of the regular organ's functionality when clearing creatinine from the blood.

Key reports:

US Health & Human Services: [2020: A New Vision – A Future for Regenerative Medicine](#)

McKinsey & Company: [And the winner is... – Capturing the promise of philanthropic prizes](#)

Related news articles, 2012-2013:

AP: [To ease shortage of organs, grow them in a lab?](#)

Nature: [Tissue engineering: How to build a heart](#)

The Scientist: [Replacement parts](#)

Esquire: [Whatever happened to stem cells?](#)

CNN: [The great stem cell dilemma](#)

Endorsements:

“The Founding Fellows of the Tissue Engineering & Regenerative Medicine International Society (TERMIS) strongly and enthusiastically endorse the New Organ initiative. Regenerative medicine has made significant advances in the past 15 years and the New Organ Liver Prize represents a golden opportunity for the next leap forward. The public and the medical community will realize a remarkable clinical benefit with the availability of ‘off the shelf’ whole livers obviating the need for donor organs, and the medical healthcare system will simultaneously benefit. We hope this forward-looking effort sets the standard that inspires other initiatives to quickly and efficiently focus all the resources of regenerative medicine on solving major health care challenges.”

– Founding Fellows, TERMIS

“Tissue and organ engineering is coming of age and complements the field of stem-cell-based regeneration. It's time for a prize that hastens the technological breakthroughs to remove one of the darkest shadows today: the worldwide organ donor shortage. We need strong incentives and imaginative approaches. New Organ enables both.”

– X PRIZE Foundation

“The New Organ Liver Prize is a valuable experiment working to accelerate whole organ engineering. Scientists have long been looking for ways to solve the global organ shortage, with researchers only recently moving to the third dimension using multiple cell types that are necessary for forming human organ replacements. There will always be more to learn in the lab, but patients are dying every day waiting for transplants. If successful, New Organ will help mobilize scientists, innovators, academia, government, philanthropy, and industry around the world to solve specific tangible objectives that will move us more quickly toward saving more lives.”

– Scott Collins, PhD, TeVido BioDevices



“Every competition claims to be the ‘ultimate challenge,’ but for patients waiting for a transplant, New Organ is the real deal. Vision, leadership, innovation, and multidisciplinary collaborations will in the future deliver safe and efficacious solid organs – the question is when? New Organ will help accelerate the production of cost-effective organs for routine clinical use.”

– Chris Mason, MBBS, PhD, University of College London

“Tissue engineering is a very important field. Incentives that bring more people into the field and increase funding is critical. New Organ should aid in this cause.”

– Robert S. Langer, PhD, MIT

“How fast whole organ engineering can move forward depends heavily on getting more people involved and more research funds dedicated. New Organ is a powerful focal point around which scientific talent can rally to achieve incredible outcomes.”

– Keith Murphy, Organovo

“New Organ will push tissue and organ regeneration to the next level. By challenging investigators to ‘think big,’ transformative changes in technology, as well as bioreactor and tissue design, should propel us to the next generation of replacement organs.”

– Laura Niklason, MD, PhD, Yale School of Engineering & Applied Science

“The next triumph in the battle against disease and illness will be achieved through the advances of tissue engineering and regenerative medicine. This ultimate accomplishment in medical treatment will revolutionize healthcare and bring about the true concept of ‘cure.’ The New Organ Prizes will push forward this future and accelerate its realization for people suffering from many different diseases.”

– Mordechai S. Nosrati, MD, Keck-USC School of Medicine

“Developing the field of regenerative medicine is a grand challenge for the twenty-first century, and incentive prizes are a powerful lever for accelerating growth in new areas. New Organ is a well-designed, thoughtful prize program, and it couldn’t have arrived at a better time.”

– Alan Russell, PhD, Carnegie Mellon University

“The shortage of donor organs for transplantation has been a serious burden on the transplant medical community, as it lacks the means to help the majority of patients in need of a new organ. The last two decades, though, have brought significant progress in the fields of material science, cell biology, and stem cell research. These advances, together with the emergence of tissue engineering, have made it possible to fabricate tissues from human cells in the laboratory. For the first time, we can hope for a real solution to the acute global shortage of tissues and organs for transplantation. However, much more research is still needed in order to bring these early successes to patients. The initiative taken by New Organ provides tremendous support for the efforts made towards organ bioengineering and has the potential to make the dream of creating replacement organs in the laboratory come true.”

– Shay Soker, PhD, Wake Forest Institute for Regenerative Medicine