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eGenesis Announces Publication in Nature of Landmark Preclinical Data Demonstrating Long-Term Survival with Genetically Engineered Porcine Kidneys

- Proof of concept study resulted in life-supporting organ function and recipient survival of over two years

- Donor kidneys carrying human transgenes resulted in longer survival time

CAMBRIDGE, Mass., Oct. 11, 2023 (GLOBE NEWSWIRE) -- eGenesis, a biotechnology company developing human-compatible (HuCo™) organs for the treatment of organ failure, today announced publication in the journal *Nature* of long-term survival data from a proof-of-concept study evaluating engineered porcine donor kidneys transplanted into a cynomolgus macaque model. This dataset will support advancement of the company's lead candidate for kidney transplant, EGEN-2784, toward clinical development.

These results represent the largest and most comprehensive preclinical dataset published in the field to date. Recipient survival in the preclinical setting has historically been measured in weeks or months. The publication titled: "Design and Testing of a Humanized Porcine Donor for Xenotransplantation," reported long-term survival of NHP recipients of the company's genetically engineered porcine kidneys. In the case of one recipient, survival of over two years (758 days) was achieved.

"At eGenesis, we are focused on transformational progress for the field – improving long-term survival for transplant recipients from months to years," said Michael Curtis, Ph.D., Chief Executive Officer of eGenesis. "Our HuCo™ organs offer the hope of a new donor source for the hundreds of thousands of individuals in need of lifesaving organ transplants. The data published in *Nature* illustrate our rapid advancement in engineering porcine donor organs to enhance recipient compatibility and long-term survival, a critical step toward successful translation in human clinical trials."

The donor kidneys evaluated in this study carried three types of edits: (1) knock out of three genes involved in the synthesis of glycan antigens implicated in hyperacute rejection, (2) insertion of seven human transgenes involved in the regulation of several pathways that modulate rejection: inflammation, innate immunity, coagulation, and complement, and (3) inactivation of the endogenous retroviruses in the porcine genome.

Donor kidneys carrying human transgenes resulted in longer survival time when transplanted into NHPs. Donor kidneys containing only knock out of the three-glycan antigens experienced poor graft survival, whereas those harboring the knock outs and human transgenes resulted in more than seven times longer duration – a median of 24 days versus 176 days, respectively. The results indicate the benefit of human transgene expression in porcine kidney grafts on long-term survival.

In vitro functional analysis showed that edited porcine kidney endothelial cells modulated inflammation in a manner that mirrored human endothelial cells, suggesting the edited cells acquired a high level of human immune compatibility. Furthermore, the evaluation of renal function biomarkers in recipients with stable grafts revealed that a single transplanted porcine kidney provided sufficient filtration of metabolites to compensate for the lack of two native kidneys.

“This is a major step forward for the field of transplantation,” said Tatsuo Kawai, M.D., Ph.D., Professor of Surgery at Harvard Medical School and A. Benedict Cosimi Chair in Transplant Surgery at Massachusetts General Hospital. “One of the biggest hurdles has been long-term survival of the genetically engineered organ in the NHP recipient, and this dataset demonstrates remarkable progress in editing the porcine genome to minimize hyperacute rejection, improve recipient compatibility and address the risk of viral transmission from donor to host. We anticipate that transplant outcomes in humans will be even more favorable, as these gene edited organs are a better match for humans, as compared with NHPs.”

The data generated in this study will support the advancement of the company’s lead candidate for kidney transplant, EGEN-2784, toward clinical development. eGenesis is also progressing programs for extracorporeal liver perfusion as well as cardiac transplant.

Organ failure is a life-threatening condition for which transplantation is considered the gold standard treatment. However, the demand for organs far outstrips supply – of the more than 100,000 individuals on the organ transplantation waitlist in the U.S., less than 40% will receive a potentially life-saving organ. In addition, the existing organ failure treatment paradigm is suboptimal for patients and the healthcare system due to organ incompatibility and variable donor organ quality.

About eGenesis
eGenesis is pioneering a genome engineering-based approach in the development of safe and effective transplantable organs. The eGenesis Genome Engineering and Production (EGEN™) Platform is the only technology of its kind to comprehensively address cross-species molecular incompatibilities and viral risk via genetic engineering. eGenesis has demonstrated durable preclinical success to date and is advancing development programs for acute liver failure, kidney transplant, and pediatric as well as adult heart transplant. Learn more at www.egenesisbio.com.

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