The need for human organs far outpaces their availability, with more than 20 people dying each day waiting for a transplant. In particular, patients with end-stage liver disease (ESLD) have only one existing option for survival: liver transplantation. While many patients in the US have ESLD, only a few will receive a transplant. Remaining therapies for ESLD are palliative in nature and costly for hospitals. Our innovative cell-based therapy generates functional ectopic livers in ESLD patients, improving liver function, ameliorating related complications, and prolonging survival. A franchise model will establish LyGenesis Centers of Excellence near transplant-performing hospitals, increasing access to lifesaving therapy while also generating significant revenues, all at a cost-savings relative to transplantation.

**Technology Description**

When a liver is identified as not suitable for organ transplant, it will be transferred to a LyGenesis satellite to extract hepatocyte cells. At the same time, patients on the waiting list are contacted to come to the same LyGenesis location for preparation. In a minimally-invasive procedure, the cell suspension is transplanted into patients’ lymph nodes, where they survive, multiply, and ultimately grow into functional mini-livers. This technique has proven effective for treating liver disease in mice and pigs.

**Advantages**

- Can be used to treat ESLD patients who are not eligible for liver transplant due to complications and comorbidities
- Increases availability of ESLD treatment
- Uses livers deemed unsuitable for transplantation
- Minimally-invasive

**Applications**

- Patients who need a liver transplant, but are either are ineligible to receive one or too sick to wait on a long list
- Underlying technology can be expanded to other organs (e.g., thymus or pancreas)

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**Stage of Development**

In collaboration with Mayo Clinic, we are currently evaluating another large animal model (Tyrosinemic pig). We are also planning for a pre-IND meeting with the FDA and a final pre-clinical large animal model.

**IP Status**

- US patent 9,125,891 issued September 2015
- Continuation application 14/810,064 filed July 2015
- US provisional patent application filed February 2017

**Notable Mentions**

- In 2010, The Discovery Channel series, “Dean of Invention,” featured a segment on this work entitled, “Growing New Organs Inside the Body.”
- In 2012, Discover Magazine ran an article, “Big Idea: Turning Lymph Nodes Into Liver-Growing Factories,” about this technology.
Dr. Lagasse carried out his doctoral training at the University of Basel Biocenter and the pharmaceutical company Ciba-Geigy, which is now owned by Novartis. He went on to do post-doctoral work with Dr. Irving Weissman in the Department of Developmental Biology and Pathology at Stanford University. Dr. Lagasse then served as the Director of the Liver Stem Cell Discovery Program at StemCells Inc, in Palo Alto, CA until he joined the McGowan Institute in 2004.

Dr. Lagasse has authored of over 50 publications, including book chapters and is a much sought after presenter. Since 2000, he has made over 100 presentations to national/international audiences.

**Education**
PharmD
University of Strasbourg, France

PhD in Microbiology
University of Basel, Switzerland

**Publications**


