Liver cells, insulin-producing cells, thymus can be grown in lymph nodes

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(Phys.org)—Lymph nodes can provide a suitable home for a variety of cells and tissues from other organs, suggesting that a cell-based alternative to whole organ transplantation might one day be feasible, according to researchers at the University of Pittsburgh School of Medicine and its McGowan Institute for Regenerative Medicine. In a report recently published online in *Nature Biotechnology*, the research team showed for the first time that liver cells, thymus tissue and insulin-producing pancreatic islet cells, in an animal model, can thrive in lymph nodes despite being displaced from their natural sites.

Hepatitis virus infection, alcoholic cirrhosis and other diseases can cause so much damage that liver transplantation is the only way to save the patient, noted senior investigator Eric Lagasse, Pharm. D., Ph.D., associate professor, Department of Pathology, Pitt School of Medicine. Children with DiGeorge syndrome lack functional thymus glands to produce essential immune cells, and diabetes can be cured with a pancreas transplant.

"However, the scarcity of donor organs means many people will not survive the wait for transplantation," said Dr. Lagasse, whose lab is at the McGowan Institute. "Cell therapies are being explored, but introducing cells into tissue already ravaged by disease decreases the likelihood of successful engraftment and restoration of function."

In the study, his team tested the possibility of using lymph nodes, which are abundant throughout the body and have a rich blood supply, as a new

home for cells from other organs in what is called an "ectopic" transplant.

They injected healthy liver cells from a genetically-identical donor animal into lymph nodes of mice at various locations. The result was an enlarged, liver-like node that functioned akin to the liver; in fact, a single hepatized lymph node rescued mice that were in danger of dying from a lethal metabolic liver disease. Likewise, thymus tissue transplanted into the lymph node of mice that lacked the organ generated functional immune systems, and pancreatic islet cell transplants restored normal blood sugar control in diabetic animals.

"Our goal is not necessarily to replace the entire liver, for example, but to provide sufficient cell mass to stabilize liver function and sustain the patient's life," Dr. Lagasse said. "That could buy time until a donor organ can be transplanted. Perhaps, in some cases, ectopic cell transplantation in the lymph node might allow the diseased organ to recover."

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