

Announcement at the Japanese Cancer Association regarding embryonic stem (ES) cell research ; Pancreas differentiation of ES cells in vivo

Effector Cell Institute, Inc will present recent research developments made by an effort led by ECI's senior researcher Gary Quinn, Ph.D. and our research collaboration group at the National Cancer Center at the Japanese Cancer Association conference (Pacifico Yokohama, 9/28-9/30). The developments will concern pancreatic regeneration by using mouse embryonic stem cells.

Furthermore, acceptance of these results by "Diabetologia," the official journal for the European Association for the study of diabetes will also be announced.

Fundamental research in regenerative medicine has been a valued project at ECI (President Shiro Kangeasaki). It has been discovered that a damaged pancreas can regenerate and secrete insulin production. ECI is putting forth plans to further investigating and identifying the biological factors involved in regeneration and treatment options in regenerative medicine.

<Reference information>

[Summary of announcements]

Adult nude mice received a lowered dose of streptozotocin(STZ) which caused 50% decreased efficiency of the pancreas and then received mouse ES cells by i.p. injection. Transplanted ES cells homed in to the STZ-injured pancreas and formed tumors. Immunocytochemical analysis of pancreas-associated ES tumors revealed foci containing insuline/PDX-1 double-positive and glucagon-positive/PDX-1-negative cell clusters. These findings are important in understanding adult pancreas regeneration and for identifying potential soluble factors for in vitro differentiation of insulin-producing β cells for the treatment of diabetes. ECI plans to begin looking into research treatments for diabetes and recovery of pancreatic function.

【Vocabulary】

- Embryonic stem cell (ES cell): A cell capable of differentiating into any one of the three germ layers, thus capable of forming any tissue type or body
- Streptozotocin: An antibiotic produced by *Streptomyces achromogenes* which destroys β cells in the islets of Langerhans found in the pancreas, causing a halt in insulin production and resulting

in diabetes in mice.

- Insulin: A peptide hormone created from 21 amino acid residues. In times of high blood-sugar levels, insulin is secreted by β cells and will lower blood-glucose levels commonly used as a treatment for type-1 diabetes.
- Glucagon: A peptide hormone created from 29 amino acid residues. In times of low blood-sugar levels, glucagon is secreted by α cells in the pancreas and will raising blood-glucose levels.
- PDX-1: A transcription factor considered to be one of the main switches of differentiation into pancreatic cells.