

What is claimed is:

1. A population of cells expressing markers characteristic of the pancreatic endocrine lineage that co-express NKX6.1 and insulin and wherein less than 10% of the cells in the population express glucagon.
2. The population of cells in claim 1, wherein at least 30% of the cells express NKX6.1.
3. The population of cells in claim 1, wherein at least 40% of the cells express NKX6.1.
4. The population of cells in claim 1, wherein at least 50% of the cells express NKX6.1.
5. The population of cells in claim 1, wherein at least 60% of the cells express NKX6.1.
6. The population of cells in claim 1, wherein at least 5% of the cells express insulin.
7. A method to generate a population of cells expressing markers characteristic of the pancreatic endocrine lineage that co-express NKX6.1 and insulin and wherein less than 10% of the cells in the population express glucagon, the method comprising the steps of:
 - a. Culturing pluripotent stem cells,
 - b. Differentiating the pluripotent stem cells into cells expressing markers characteristic of the definitive endoderm lineage,
 - c. Differentiating the cells expressing markers characteristic of the definitive endoderm lineage into cells expressing markers characteristic of the pancreatic endoderm lineage, and
 - d. Differentiating the cells expressing markers characteristic of the pancreatic endoderm lineage into cells expressing markers characteristic of the pancreatic endocrine lineage that co-express

NKX6.1 and insulin and minimal amounts of glucagon by culturing the cells expressing markers characteristic of the pancreatic endoderm lineage in a medium supplemented with a factor capable of inhibiting BMP, a TGF β receptor signaling inhibitor, and a protein kinase C activator.

What is claimed is:

1. A population of cells expressing markers characteristic of the pancreatic endocrine lineage that co-express NKX6.1 and insulin wherein less than 10% of the cells in the population express glucagon and wherein at least 60% of the cells express NKX6.1