What is claimed is:

1. A population of cells, wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage.

2. A method for generating a population of cells wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage, comprising the steps of:

    a. Culturing a population of pluripotent stem cells,

    b. Differentiating the population of pluripotent stem cells to a population of cells wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage in medium wherein the concentration of glucose does not exceed 10.5 mM.

3. The method of claim 2, wherein the population of pluripotent stem cells are differentiated to a population of cells wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage using activin A and a Wnt ligand.

4. The method of claim 2, wherein the population of pluripotent stem cells are differentiated to a population of cells wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage using GDF-8 and at least one other factor is selected from the group consisting of: an aniline-pyridinotriazine, a cyclic aniline-pyridinotriazine, N-{[1-(Phenylmethyl)azepan-4-yl]methyl}-2-pyridin-3-ylacetamide, 4-{[4-(4-{[2-(Pyridin-2-ylamino)ethyl]amino}-1,3,5-triazin-2-yl)pyridin-2-yl]oxy}butan-1-ol, 3-({3-[4-({2-[Methyl(pyridin-2-yl)amino]ethyl}amino)-1,3,5-triazin-2-yl]pyridin-2-yl}amino)propan-1-ol, N~4~-[2-(3-Fluorophenyl)ethyl]-N~2~-[3-(4-methylpiperazin-1-yl)propyl]pyrido[2,3-d]pyrimidine-2,4-diamine, 1-Methyl-N-[(4-pyridin-3-yl-2-{[3-(trifluoromethyl)phenyl]amino}-1,3-thiazol-5-yl)methyl]piperidine-4-carboxamide, 1,1-Dimethylethyl {2-[4-({5-[3-(3-hydroxypropyl)phenyl]-4H-1,2,4-triazol-3-yl}amino)phenyl]ethyl}carbamate, 1,1-Dimethylethyl {[3-({5-[5-(3-hydroxypropyl)-2-(methyloxy)phenyl]-1,3-oxazol-2-

yl}amino)phenyl]methyl}carbamate, 1-({5-[6-({4-[(4-Methylpiperazin-1-yl)sulfonyl]phenyl}amino)pyrazin-2-yl]thiophen-2-yl}methyl)piperidin-4-ol, 1-({4-[6-({4-[(4-Methylpiperazin-1-yl)sulfonyl]phenyl}amino)pyrazin-2-yl]thiophen-2-yl}methyl)piperidine-4-carboxamide, and 2-{[4-(1-Methylethyl)phenyl]amino}-N-(2-thiophen-2-ylethyl)-7,8-dihydropyrido[4,3-d]pyrimidine-6(5H)-carboxamide.

5. The method of claim 4, wherein the at least one other factor is 14-Prop-2-en-1-yl-3,5,7,14,17,23,27-heptaazatetracyclo[19.3.1.1~2,6~.1~8,12~]heptacosa-1(25),2(27),3,5,8(26),9,11,21,23-nonaen-16-one.

6. The method of claim 2, wherein the concentration of glucose does not exceed 5.5 mM.

What is claimed is:

1. A population of cells, wherein greater than 80% of the cells in the population express markers characteristic of the definitive endoderm lineage.