

FACT SHEET

Summary of key patents

Patent 5,483,780

Issue date: 1/20/95

Primate embryonic stem cells – cell culture and method

This patent was the first filed to protect discoveries by Dr. James Thomson relating to primate embryonic stem cells derived from pre-implantation embryos. The patent, referred to as 780, claims a purified preparation of these cells capable of proliferating in an in vitro culture for more than one year.

The patent includes a series of claims about the composition of the cells and the culture in which they are maintained. For example, the patent states that the cells maintain all the chromosomes characteristic of the primate species and that these chromosomes are not noticeably altered through prolonged culture. In addition, the cell culture maintains its ability to differentiate into derivatives of other tissues but will not differentiate when cultured on a fibroblast feeder layer.

The patent also covers the methods for deriving these cells. The steps include isolating a primate blastocyst; isolating cells from the inner cell mass of the blastocyst; plating the inner cell mass on embryonic fibroblasts; and culturing the cells of the selected colonies to produce an isolated primate embryonic stem cell line. The method produces a cell line that is capable of proliferation as undifferentiated cells for more than one year.

New language submitted to the patent office makes minor wording changes to clarify the claims and asserts that the cells and the method used to obtain them are novel and non-obvious.

Patent 6,200,806

Issue date: 6/26/98

Human embryonic stem cells – cell culture and method

Patent 806 builds on the methods identified in patent 780 for primate embryonic stem cells, but describes human embryonic stem cells derived from pre-implantation embryos. The patent uses language similar to the claims made for primate embryonic stem cells in describing the derivation and cultivation techniques to nurture the cells.

Again, new language submitted to the patent office makes minor amendments to clarify the claims and asserts that the process was the first to establish methods through which human embryonic stem cells could be isolated and maintained.

Patent 7,029,913

Issue date: 10/18/01

Replicating in vitro culture of human embryonic stem cells

This patent, known as 913, covers development of a replicating in vitro cell culture of human embryonic stem cells derived from a pre-implantation embryo. The cells are described as capable of proliferation in in vitro culture for more than one year without the application of exogenous leukemia inhibitory factor. The cells maintain a karyotype in which the chromosomes are euploid throughout prolonged culture and maintain the potential to differentiate into derivatives of endoderm, mesoderm and ectoderm tissues throughout the culture.

The patent also specifies certain cell surface markers that are present or absent among the cells of the in vitro culture. The cultured cells are negative for the SSEA-1 marker and positive for the SSEA-4 marker and express alkaline phosphatase.

New language submitted to the patent office uses language that parallels the amended descriptions on the other two patents, specifying for example that the stem cells are derived from a pre-implantation embryo.