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Methods of Producing Pluripotent Stem-like Cells

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Methods of Producing Pluripotent Stem-like Cells

This is a novel approach to reprogram human somatic cells into multipotent or pluripotent stem cells without involving the destruction of an embryo, and without the use of viruses. This has been accomplished in vitro in a relatively straightforward manner without the need for expensive or complicated instrumentation or reagents, and without direct genetic manipulation.

The multipotent and pluripotent stem cells have enormous medical potential for cellular transplantation, tissue regeneration, and the treatment of wounds and many human diseases (e.g., heart disease, diabetes, Parkinson's disease, cancer). It also could be useful in human developmental biology and drug discovery and medical research. This invention will allow for patient-specific multipotent and pluripotent stem cell production on a scale and in a manner consistent with widespread, common use of the techniques in clinical settings for patient therapy and in biomedical research settings for drug discovery.

Because the multipotent or pluripotent stem cells can be derived from a patient's own skin fibroblast cells, this invention will allow for patient-specific transplantation therapy with minimal risk of rejection of the transplanted cells. This invention will enable patient-specific tissue graft production to occur on-site at point-of-care. In vivo application of the invention in wound care has the potential to become commonplace and the preferred method of therapy for trauma victims. The vast amount of research now being conducted in the area of stem cell biology for the treatment of human disease can be accelerated by this invention through the practical ease of use, the plentiful supply of multipotent and pluripotent stem cell material, and the avoidance of the legal and ethical constraints of embryo destruction.