Australian Stem Cell Centre

Stem Cell Discovery Timeline

Before 1998

1956 First bone marrow transplant performed in US

1961 Canadians James Till and Ernest McCulloch prove the existence of stem cells in the bone marrow

1978 Stem cells are discovered in human cord blood

1981 First embryonic stem cells are derived from a mouse blastocyst

1988 First cord blood transplant performed in a patient with Fanconi anemia

1995 First embryonic stem cell line derived from a non-human primate

1996 First mammal cloned from an adult (somatic) cell - Dolly the sheep is born at Roslin Institute, Scotland

After 1998

1998 James Thomson, University of Wisconsin-Madison, publishes the first paper in *Science* describing human embryonic stem cells (hESCs)

1998 Osiris Therapeutics (US), begins first trial using mesenchymal stem cells (MSCs) in bone marrow transplants and now has two MSC products in clinical trials for several indications including GvHD, Crohn's disease, diabetes and cardiac disease

2000 First stem cells derived from an SCNT embryo in a mouse

2006 Shinya Yamanaka and colleagues at Kyoto University create the first iPS cells from mouse somatic cells

2007 Thomson, Yamanaka and others publish the creation of iPS cells from humans

2008 Harvard researchers publish first disease specific iPS lines for diseases including Parkinson's, Down Syndrome, juvenile diabetes and Huntington's disease

2008 Mesoblast (Aus) established in 2004, announce successful results from a clinical trial using MSC precursor cells to treat long bone fractures and now have a pipeline of products in clinical trials using MSCs to treat several indications including bone repair and cardiac disease

2009 ASCC funds early phase clinical trial at UNSW to further test the use of eye stem cells on contact lenses to treat blinding corneal disease

2010 Scientists at Stanford University directly reprogram fibroblasts to neurons without needing to return the cells to pluripotency first

2010 in Oct, Geron (US) announces it has commenced the world's first in human phase I clinical trial of a hESC based therapy for acute spinal cord injury

2010 in Nov, ReNeuron (UK) announces it has commenced the world's first human phase I clinical trial of stem cell therapy for disabled stroke patients using cells derived from foetal stem cells

2010 in Nov, Advanced Cell Technology (USA) receives FDA approval to begin clinical trials using a hESC derived treatment for a rare type of blindness known as Stargardt's Macular Dystrophy