











CHAPTER 5: CELL DIVISION

Cloning of Animals

The table below shows some successes in the cloning of animals in chronological order from 1993 until now.

Time	Milestone
<p>1993</p> 	<p>The first human was cloned in the USA. Cells taken from defective human embryos were grown <i>in vitro</i> and developed up to the 32-cell stage before they were destroyed.</p>
<p>February 1997</p> 	<p>Dr. Ian Wilmut from the Roslin Institute in Scotland cloned a sheep from somatic cells (by nuclear transfer). The lamb, named Dolly, was born in July 1996 and was the world's first cloned sheep. The success was formally announced in February 1997.</p>
<p>August 1997</p> 	<p>ABS, a US-based cattle-breeding company, succeeded in cloning a calf from the stem cells taken from the foetus of a cow.</p>
<p>July 1998</p> 	<p>The University of Hawaii succeeded in cloning mice.</p>
<p>September 1999</p> 	<p>Tetra was the world's first cloned monkey. It was cloned by embryo splitting (in the USA), using a method that is different from nuclear transfer which was the one used in the cloning of Dolly.</p>

Time	Milestone
<p>August 2000</p> 	<p>Bio Transplant Inc. and Massachusetts General Hospital in the USA succeeded in cloning miniature pigs, which will be used to grow organs for human transplants.</p>
<p>2001</p> 	<p>Scientists from the Advanced Cell Technology in Massachusetts cloned human embryos for the first time.</p>
<p>February 2002</p> 	<p>Texas A&M University announced that they had successfully cloned a domestic cat named C.C. (abbreviation for “carbon copy”).</p>
<p>March 2002</p> 	<p>French scientists announced the first clones of rabbits from adult cells.</p>
<p>May 2003</p> 	<p>Scientists from Idaho, USA developed a cloned mule, which is a sterile hybrid normally produced by cross-breeding a donkey and a horse.</p>

Time	Milestone
<p>August 2003</p> 	<p>Italian scientists announced the world's first cloned horse named Prometea.</p>
<p>February 2004</p> 	<p>South Korean researchers succeeded in cloning human embryos to extract their embryonic stem cells.</p>
<p>May 2005</p>	<p>South Korean researchers developed a better process that uses fewer human eggs to produce usable embryonic stem cells.</p>
<p>August 2005</p> 	<p>South Korean scientists produced the world's first cloned dog named Snuppy.</p>