

REPRODUCTIVE TECHNOLOGIES

SBI 3C:

WHAT CAN WE DO???



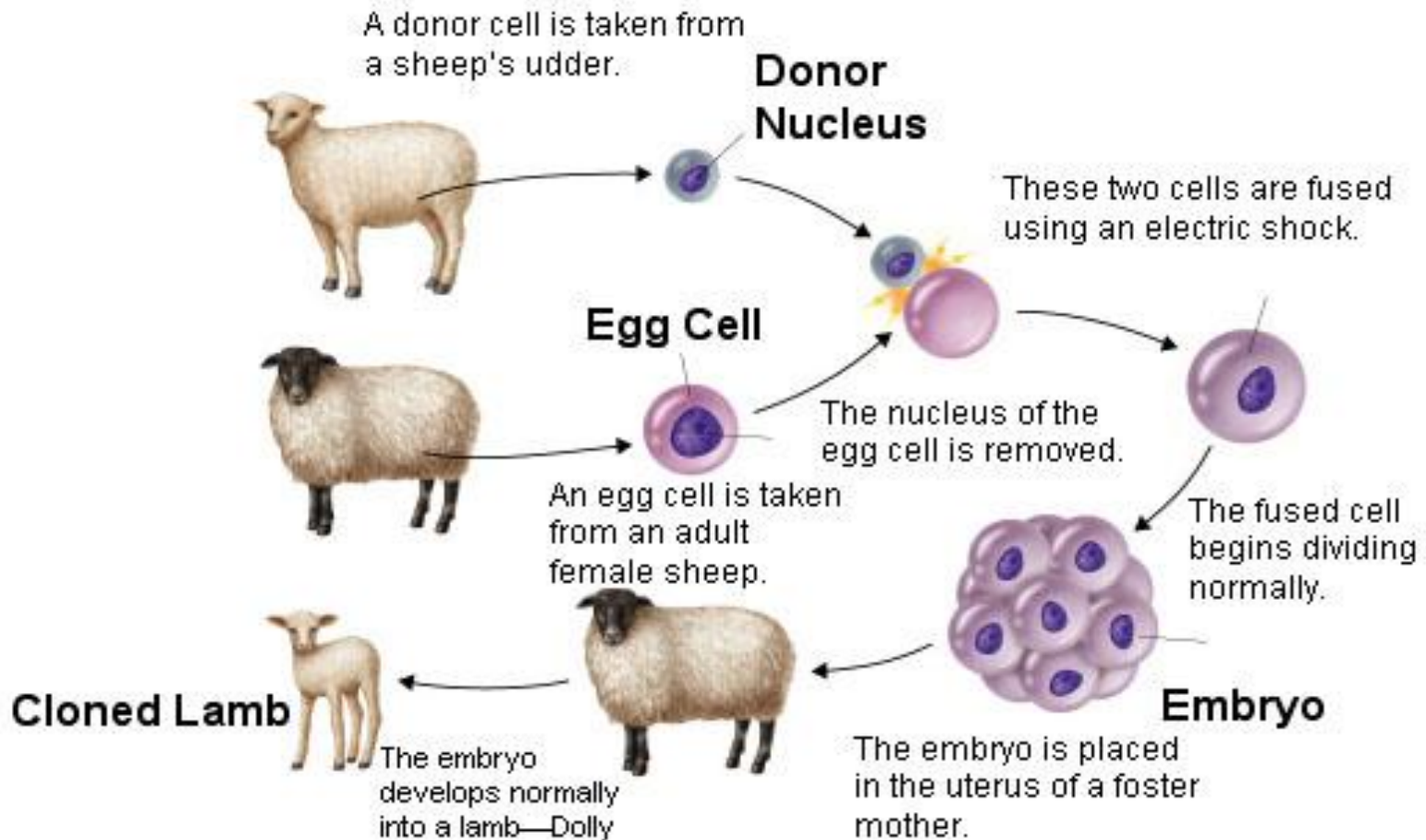
CLONING

- Way to produce a genetically identical organism through non-sexual means
- Used to produce plants for many years (using cuttings)
- Public notice: 1997 with birth of first cloned mammal
 - ▶ Dolly the sheep
 - ▶ First mammal to be cloned from a somatic cell
 - ▶ <http://www.youtube.com/watch?v=CkZV7hl-kXE>
 - ▶ Since Dolly, scientists have cloned goats, cows, mice, pigs, cats, and rabbits
 - ▶ Problems:
 - ▶ Many embryos do not survive
 - ▶ Clones can have serious health problems



METHOD OF CLONING:

▶ Nuclear Transplantation:



WHY CLONE?

- ▶ To mass produce organisms with desired qualities
 - ▶ Example:
 - ▶ sheep have been engineered to produce human insulin
- ▶ To replace lost or deceased family pets
- ▶ To repopulate endangered or even extinct species



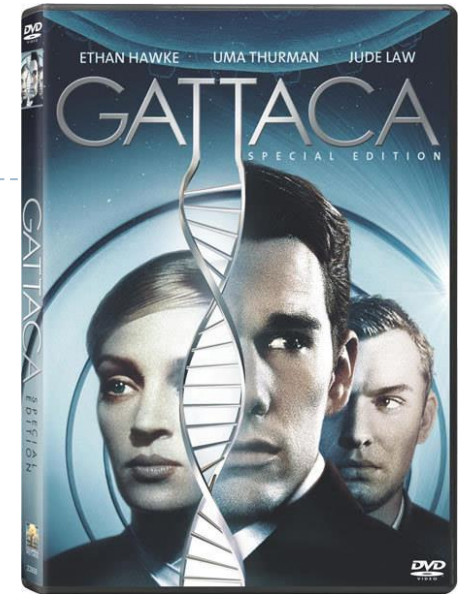
CONTROVERSY:

- ▶ After Dolly, controversy arose surrounding social, moral and ethical use of cloning
- ▶ People for cloning think it could be used to replace deceased relatives or harvest organs from a clone to remove the chance of rejection



CONTROVERSY CONTINUED:

- ▶ But not everyone liked the idea of cloning
 - ▶ To create Dolly, scientists performed the experiment 276 times, which means many failures
 - ▶ Cloning could be used to add more people to a certain race, political party, religion, background, sex, physical appearance, special talents
 - ▶ People could select traits for their children
 - ▶ To harvest organs, would have to kill the clone



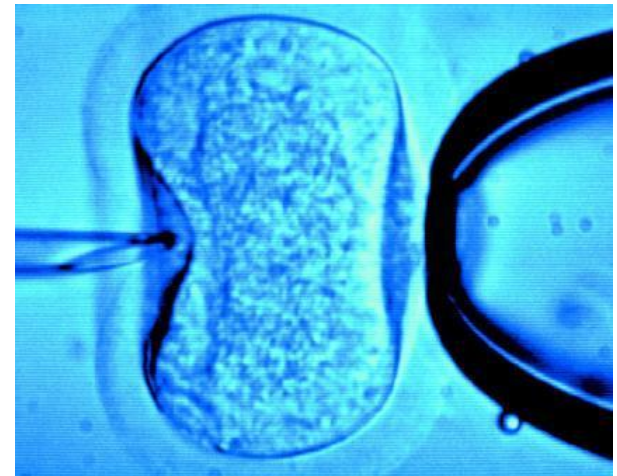
CANADIAN LAWS:

- ▶ In 2004, a bill was passed that states "No person shall knowingly create a human clone by using any technique," which would include therapeutic cloning, a technology researchers believe could lead to revolutionary treatments.
- ▶ Therapeutic cloning is based on the concept that the best way to get stem cells that are a perfect match for a patient -- thereby preventing immune rejection -- will be to create a clone of that patient, develop the embryo to around 100 cells, then remove the stem cells
- ▶ Researchers consider the technique promising for treating spinal cord injuries and Alzheimer's disease.



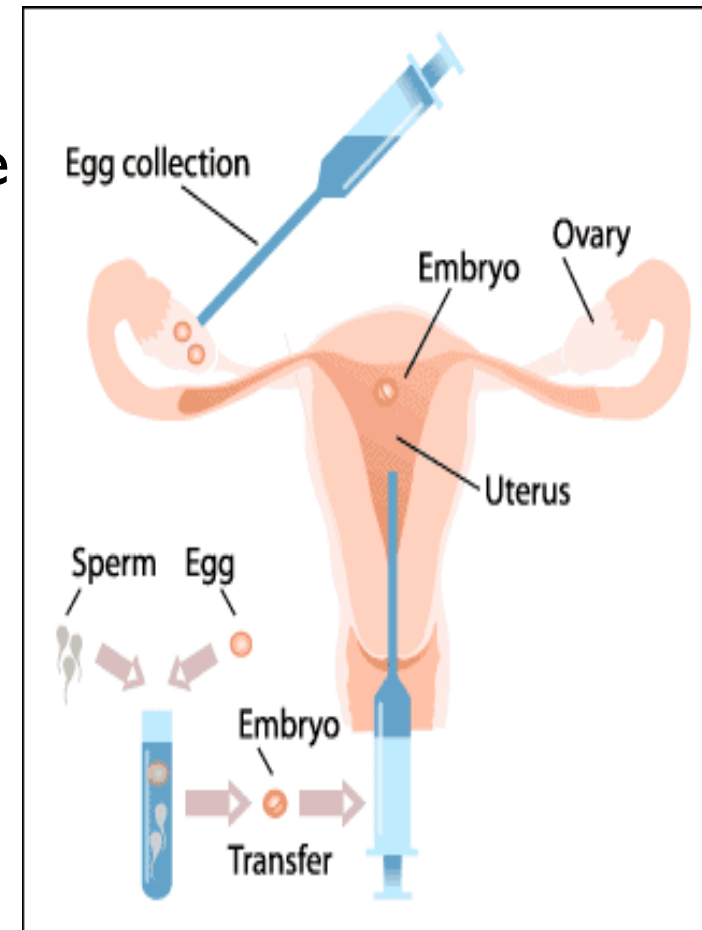
IN-VITRO FERTILIZATION:

- ▶ Approximately 10% of couples are affected by infertility
- ▶ More than 250,000 babies have been born since then as a result of using the in vitro fertilization technique
- ▶ Test tube baby was used to describe babies born by IVF
- ▶ Used for women with fallopian tube problems or males with mild sperm problems
- ▶ Costs approximately \$15,000-\$20,000
 - ▶ Only covered in Quebec



IVF: PROCESS:

- ▶ Women take hormones to prepare their eggs and uterus for pregnancy
- ▶ A man's sperm and woman's egg are combined in a petri plate in a lab
- ▶ The resulting embryo is transferred to the woman's uterus to implant and develop
- ▶ Usually 2-4 embryos are implanted at a time



ARTIFICIAL INSEMINATION:

- ▶ Sperm is artificially placed into a woman's cervix or uterus
- ▶ Semen to be implanted is “washed” in a laboratory, concentrating the semen and removing any harmful chemicals
- ▶ The semen is inserted into the woman, and if the procedure is successful, she conceives.

