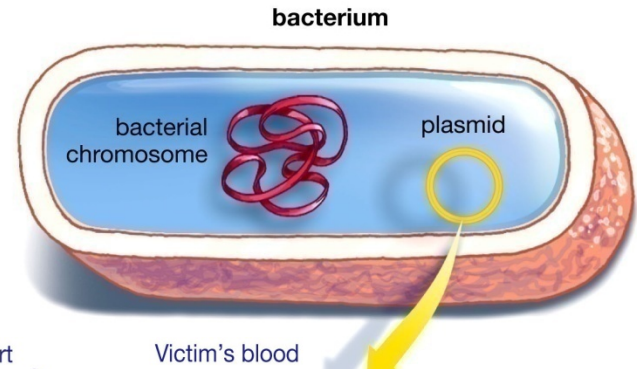


Mini Lesson#1

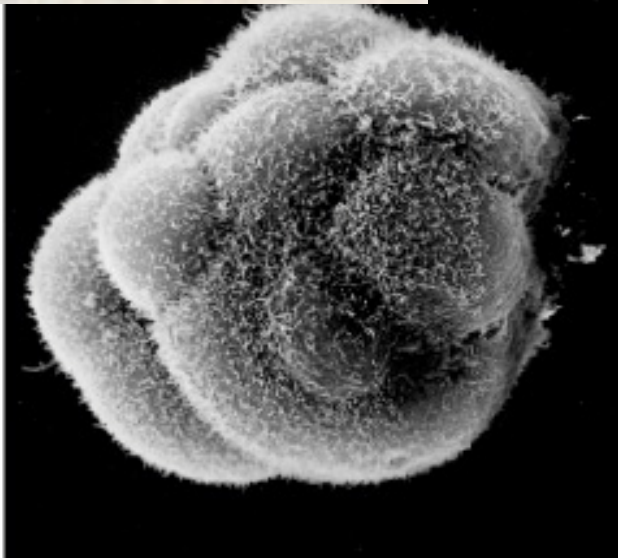
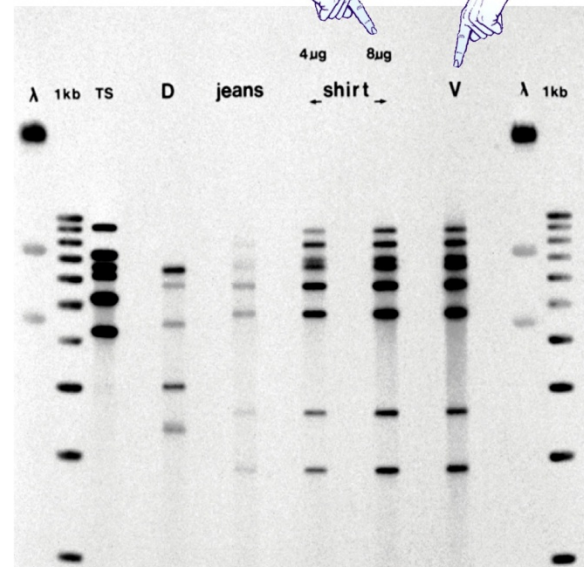
Selective Breeding/Cloning

Genetic Engineering Biotechnology



Murderer's shirt

Victim's blood



What is Genetic Engineering?

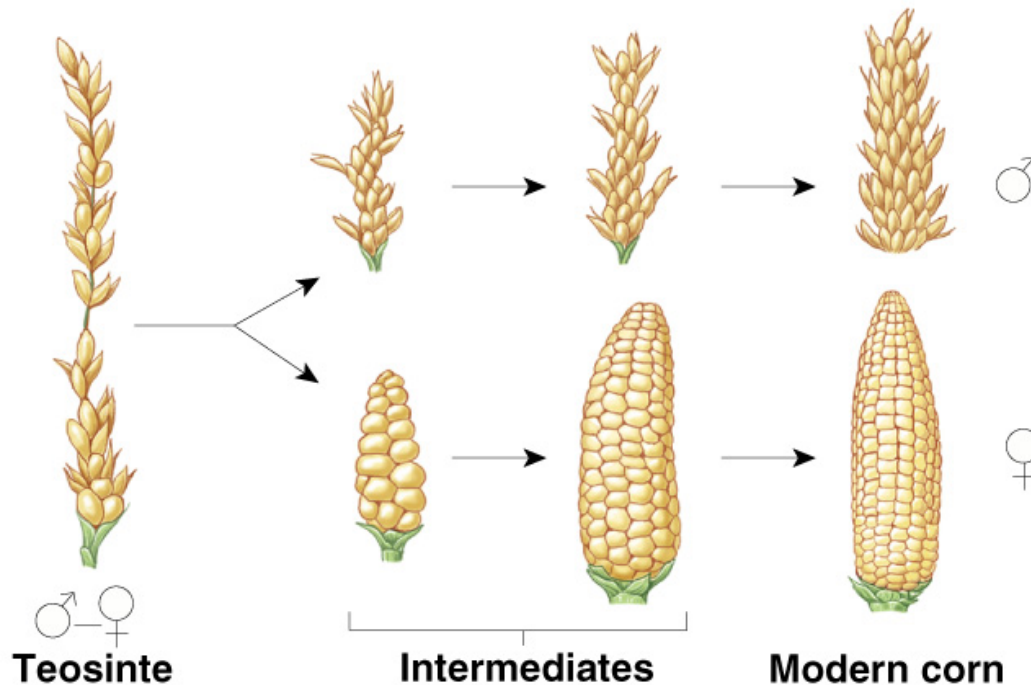
Genetic engineering is a process of manipulating the DNA of living things for useful purposes. (usually for humans.)



Artificial Selection Selective Breeding

Process has been around for thousands of years.
Genetic Engineering without technology.

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Mating organisms with different "desirable" traits to get offspring with the desirable traits of both parents.

EX: dogs, cattle, vegetable and fruits.



Selective Breeding Example A



Tough wild boars mated with friendly meaty pigs give you healthy & meaty pigs for your farm.

Tough Boar + meaty pig = Superpig



Selective Breeding Example B



Brahman cattle:
Good resistance
to heat, but poor
beef.



**English shorthorn
cattle:** Good beef
but poor heat
resistance.



**Santa Gertrudis
cattle**
(*cross of 2 breeds*)

RESULT = good beef
and resistant to heat!

hot weather cow + beefy cow = supercow



Selective Breeding Example D



little red tomato + big green = BIG RED TOMATO



Advantages of Selective Breeding

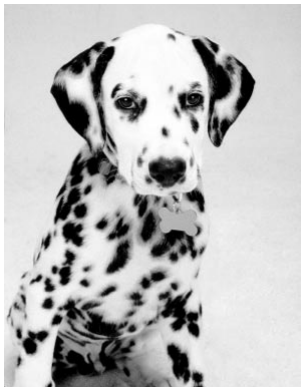


- Might get **improved** organisms
- **Don't** need any special tools or lab
- Can be performed **easily** by farmers & breeders

Disadvantages of Selective Breeding



- **Undesirable** traits from **both** parents *may* appear in the offspring
- **Disease** can accumulate in the population





CLONING



What is Cloning?

It is a way of making
IDENTICAL
GENETIC COPIES

EX:
Vegetable &
Fruits.



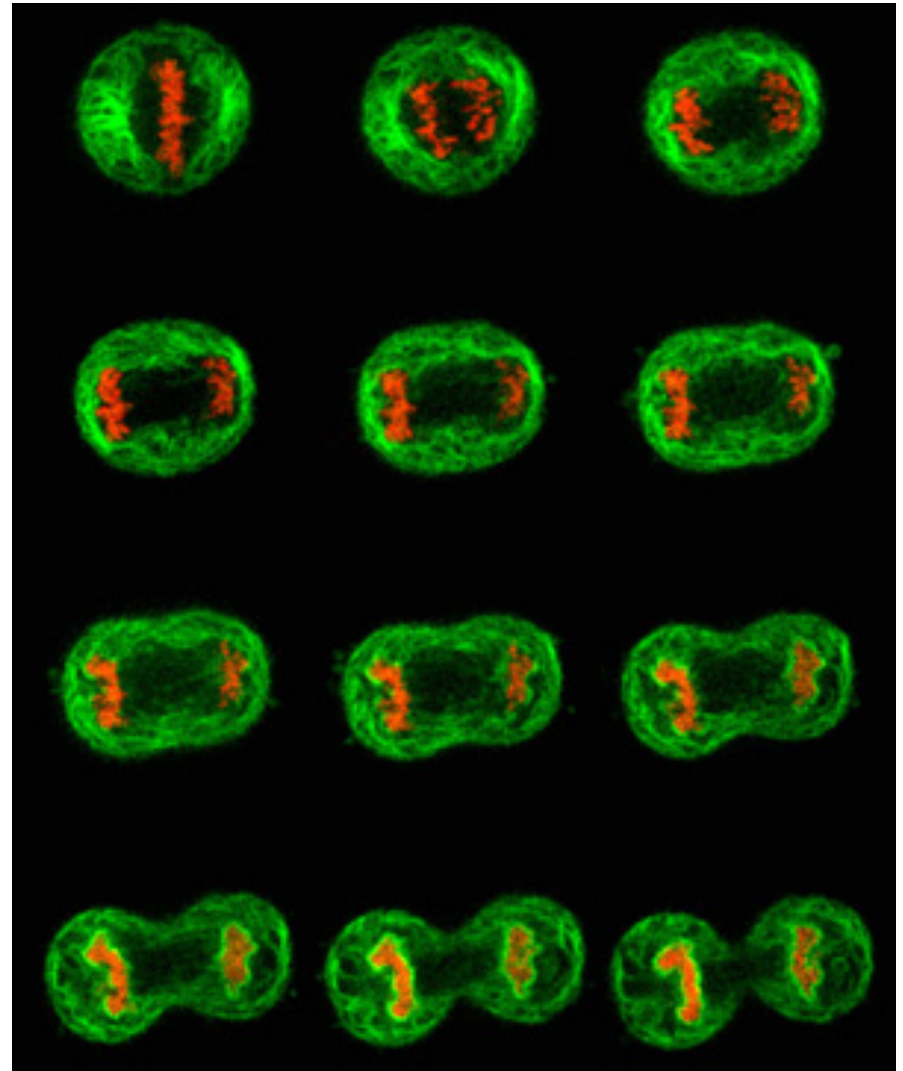
<http://science.howstuffworks.com/genetic-science/cloning.htm>

Quick Review!!

Mitosis (Asexual Reproduction)

Large organisms
use mitosis for
growth and
healing.

Simple organisms
use it to
reproduce.



Reproduction

Asexual (Mitosis)

- One parent
- Offspring are the same as parent (Identical)
- No variety

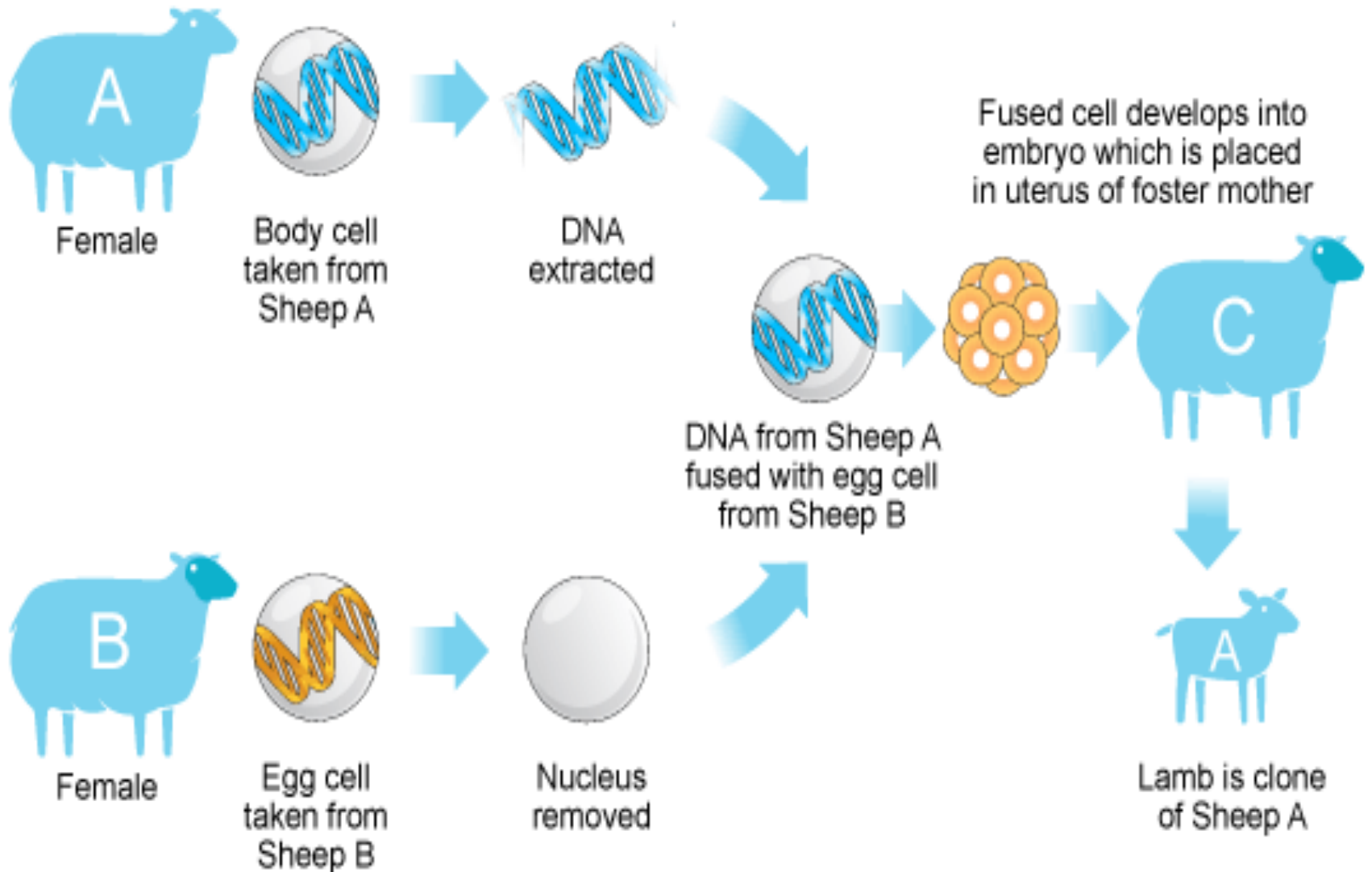
- Faster and easier

Sexual (Meiosis)

- Two parents
- Offspring gets half its DNA from each parent
- Variety. Variation allows species to have a better chance to survive

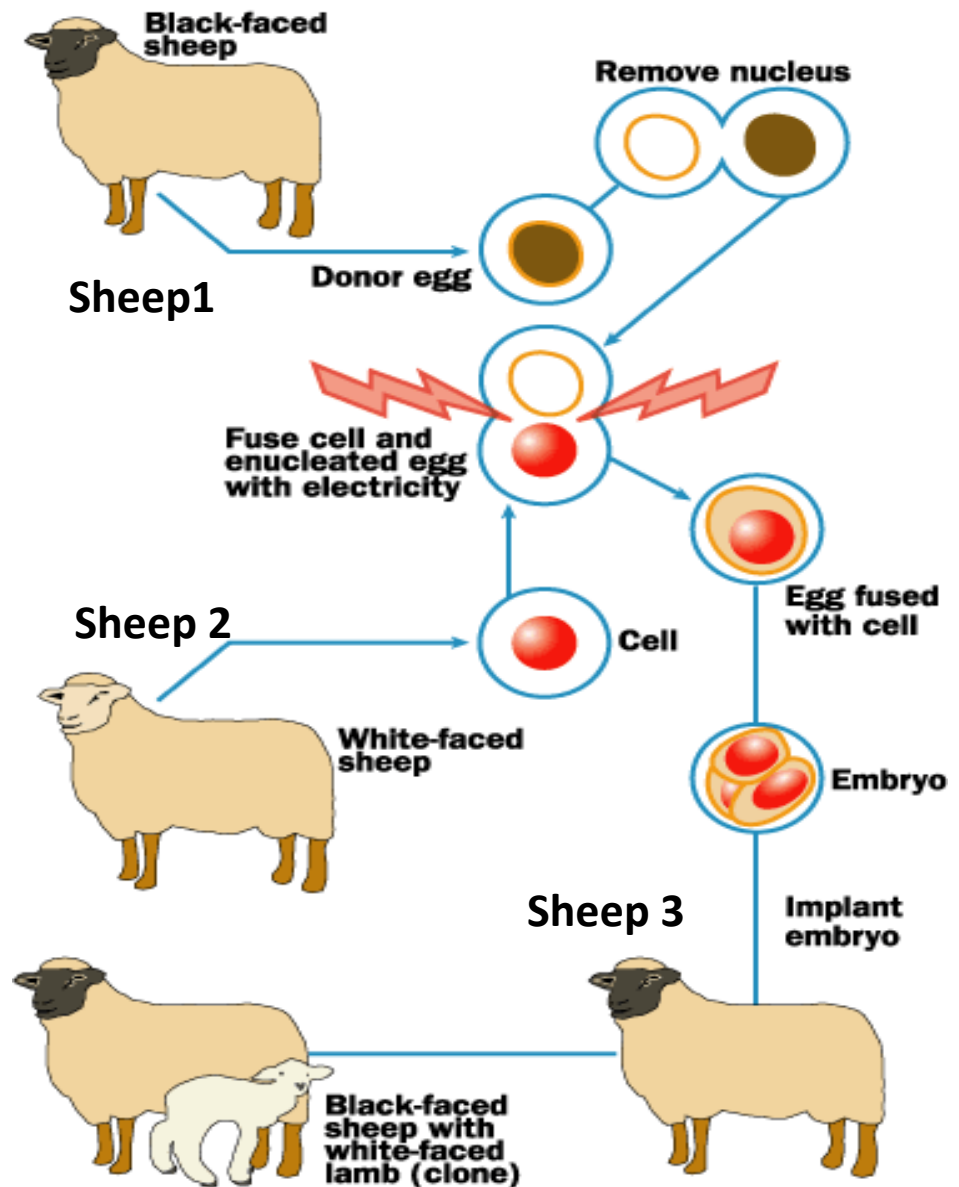
More time, effort and risk

What is the process of cloning?



Steps of Cloning of Animals

1. Remove the nucleus from the egg cell of sheep 1
2. Insert a nucleus(DNA) from sheep 2 (parent) into an empty egg cell
3. Implant the embryo into a foster (surrogate) sheep 3



Pros and Cons of Cloning?