

# **CLONING IN ISLAMIC PERSPECTIVES**



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# Objectives:

By the end of this lecture you will be able to explain about:

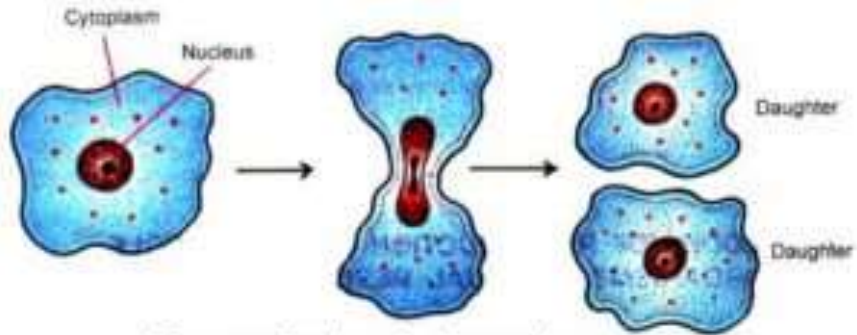
- ❖ **Definition of Cloning**
- ❖ **History of Cloning**
- ❖ **Types of Cloning**
- ❖ **Cloning Process**
- ❖ **Advantages and Disadvantages of Cloning**
- ❖ **Islamic Perspective on Cloning**

# Definition

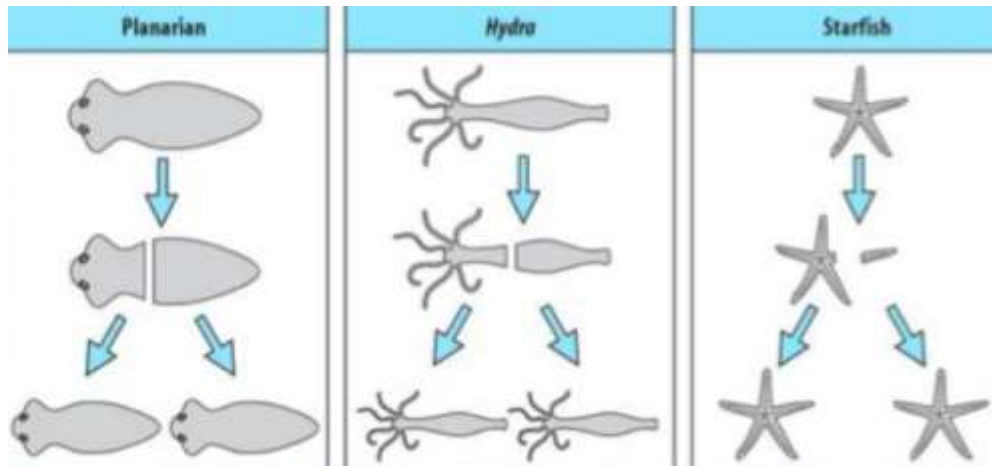
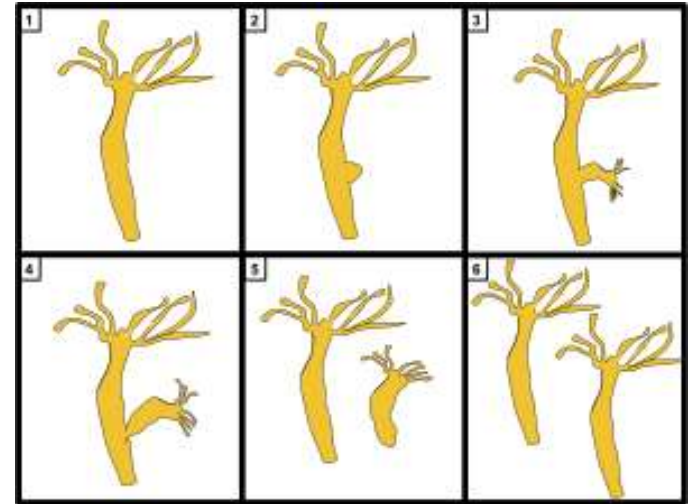
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- **Cloning** in biology is the process of producing similar populations of genetically identical individuals that occurs in nature when organisms such as bacteria, insects or plants reproduce asexually
- **Cloning** in biotechnology refers to processes used to create copies of DNA fragments (molecular cloning), cells (cell cloning), or organisms

*“The term clone is derived from the Ancient Greek word κλών (klōn, “twig”), referring to the process whereby a new plant can be created from a twig”*



**Binary fission in Amoeba**



# History of Cloning

**1944** Oswald Avery found that a cell's genetic information was carried in **DNA**

**1952** First animal cloning: Robert Briggs and Thomas J. King , successfully done nuclear transfer, cloned **northern leopard frogs**.

**1962** Biologist John Gurdon announced that he had cloned **South African frogs** using the nucleus of fully differentiated adult intestinal cells

. **1962 - 65** Robert G. McKinnell, Thomas J. King, and Marie A. Di Berardino produced **swimming larvae** from enucleated oocytes that had been injected with adult **frog** kidney carcinoma cell nuclei.

**1963** Chinese embryologist Tong Dazhou produced the world's first cloned **fish**

**1966** John B. Gurdon and V. Uehlinger **grew adult frogs** after injecting tadpole intestinal cell nuclei into enucleated oocytes.

**1977** Karl Illmensee and Peter Hoppe created **mice** with only a single parent.

**1984**, nuclear transfer successfully on mammals

**1986** Using differentiated, one week old embryo cells, Steen Willadsen cloned a **cow**.

**July 5, 1996, Dolly the sheep**, the first organism ever to be cloned from adult cells, was born.

**2000**, rhesus monkey, pig

**2001-2013**: cat, rat, mule, horse, dog, wolf, water buffalo, camel, goat, gastric brooding frog

had been successfully cloned





# Animals that had been successfully cloned





# Types of Cloning

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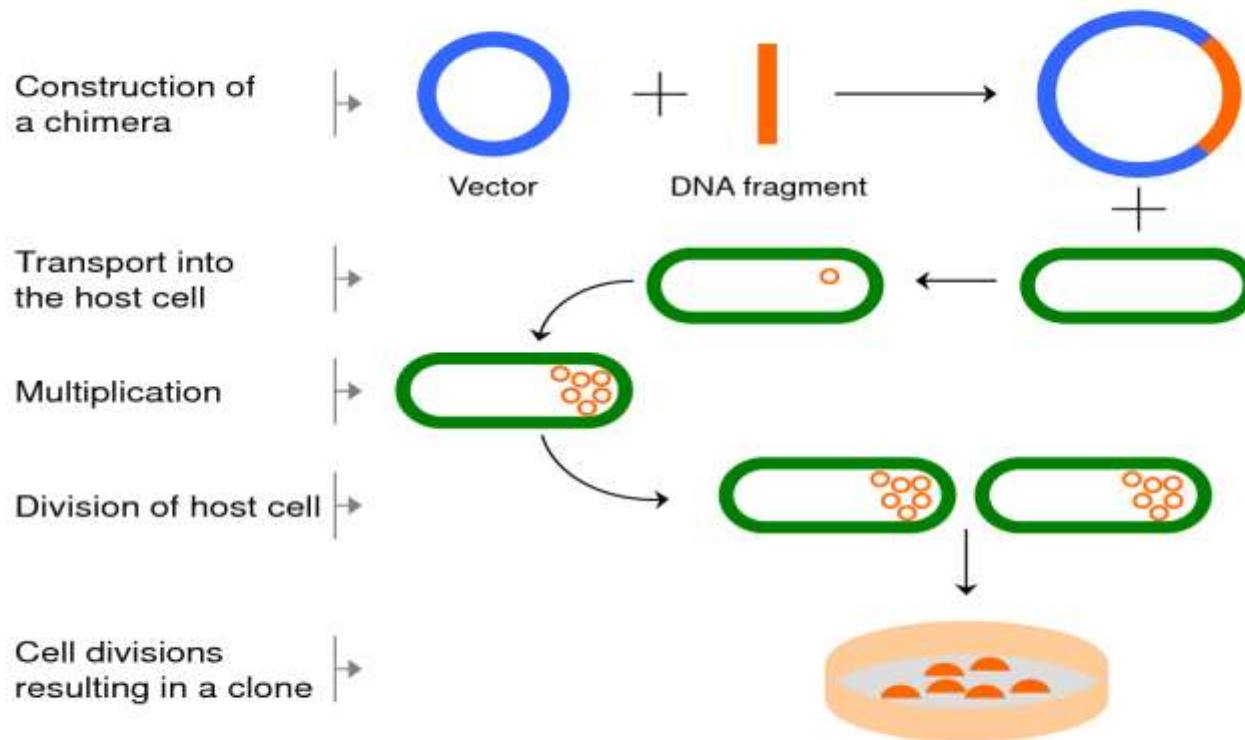
## **Based on the objects:**

- Molecular Cloning
- Cellular Cloning
- Organism Cloning

## **Based on the purpose:**

- Therapeutic Cloning
- Reproductive Cloning

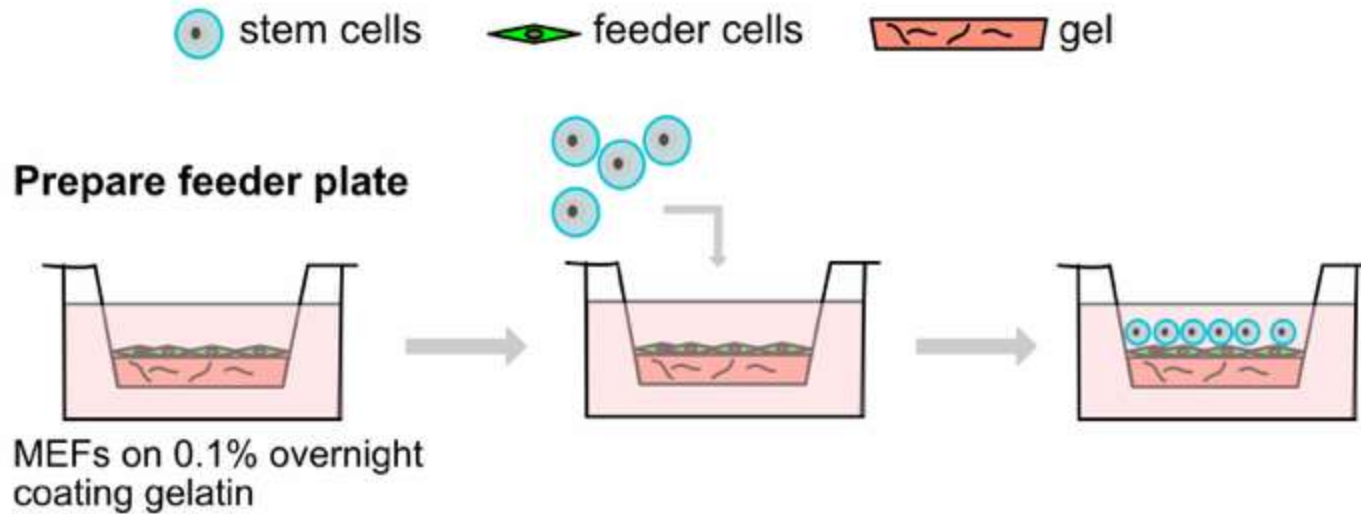
# Molecular Cloning



[www.motifolio.com](http://www.motifolio.com)

➔ *Duplication of strings of DNA containing genes in a host bacterium*

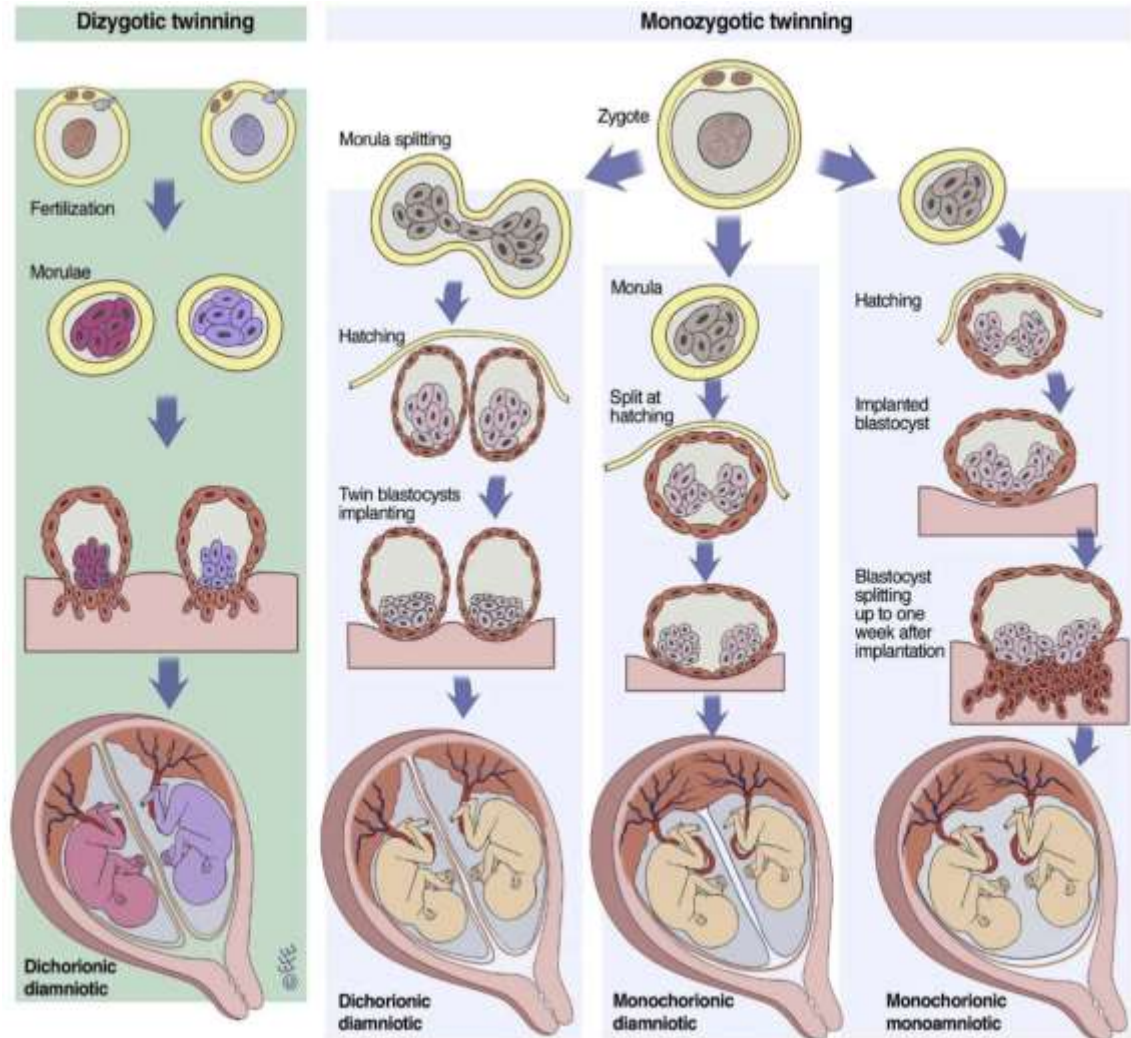
# Cellular Cloning



- ➔ *Copies of a cell are made, resulting in a 'cell line'*
- ➔ *Also happens in unicellular organism reproduction*

# Organism Cloning

- Naturally happens in embryo twinning



# Reproductive Cloning

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*A Process used to produce genetically identical individuals*

A few ways to clone animals:

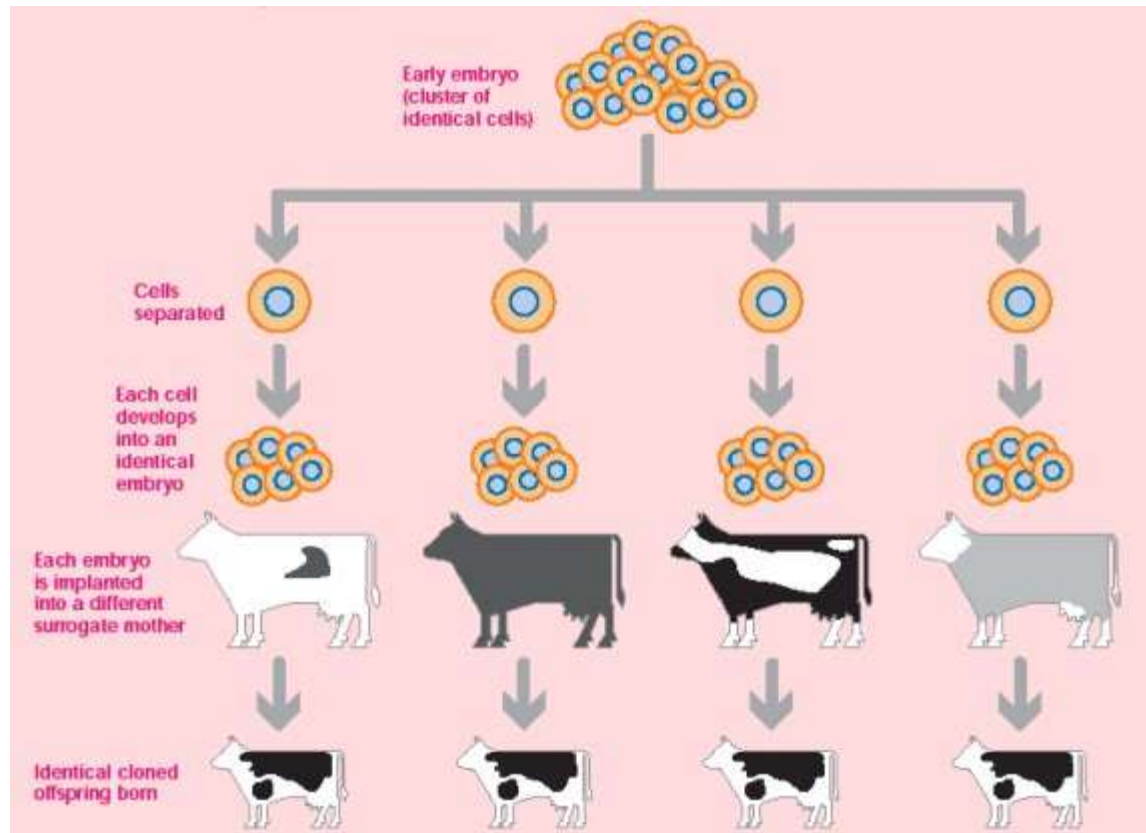
1. artificial embryo twinning
2. somatic cell nuclear transfer

# Therapeutic Cloning

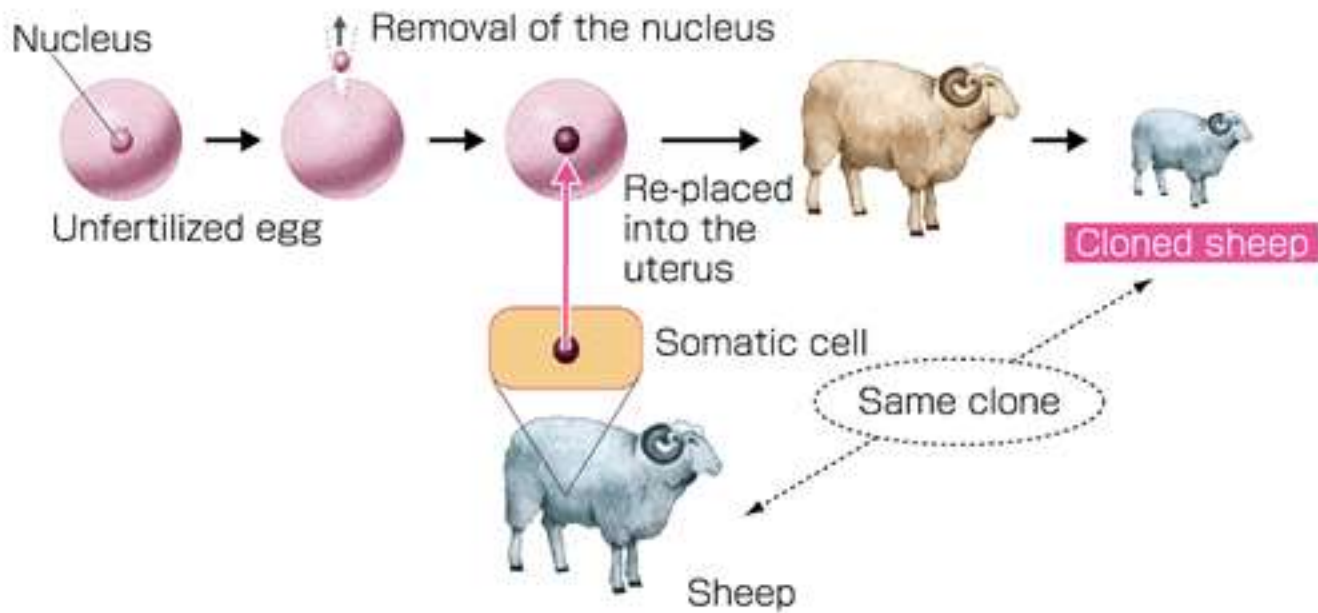
*A process to produce stem cells that will later developed into specific cells used to cure diseases*



# Reproductive Cloning: *Artificial Embryo Twinning*

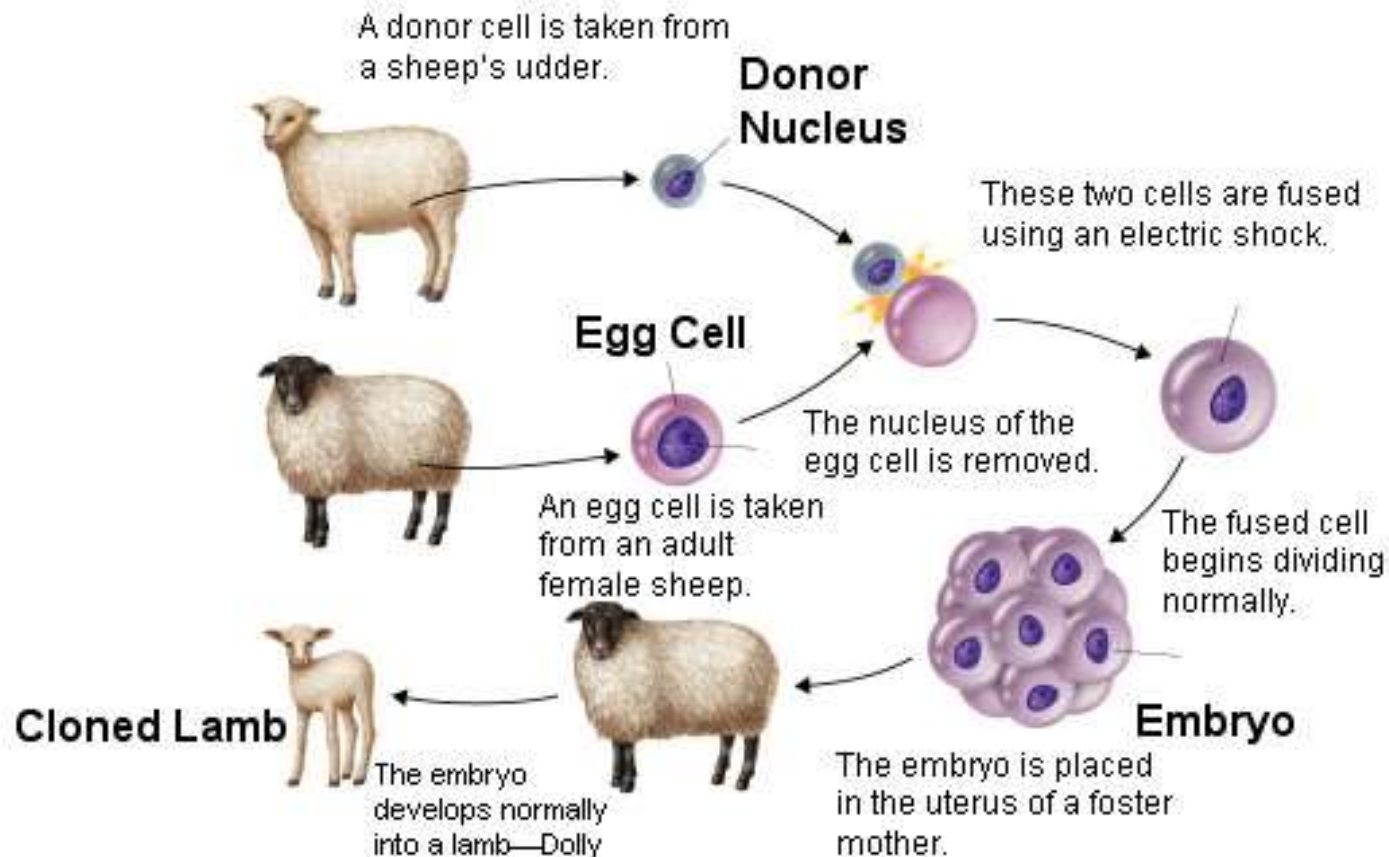


# Reproductive Cloning: *Somatic Cell Nuclear Transfer (SCNT)*

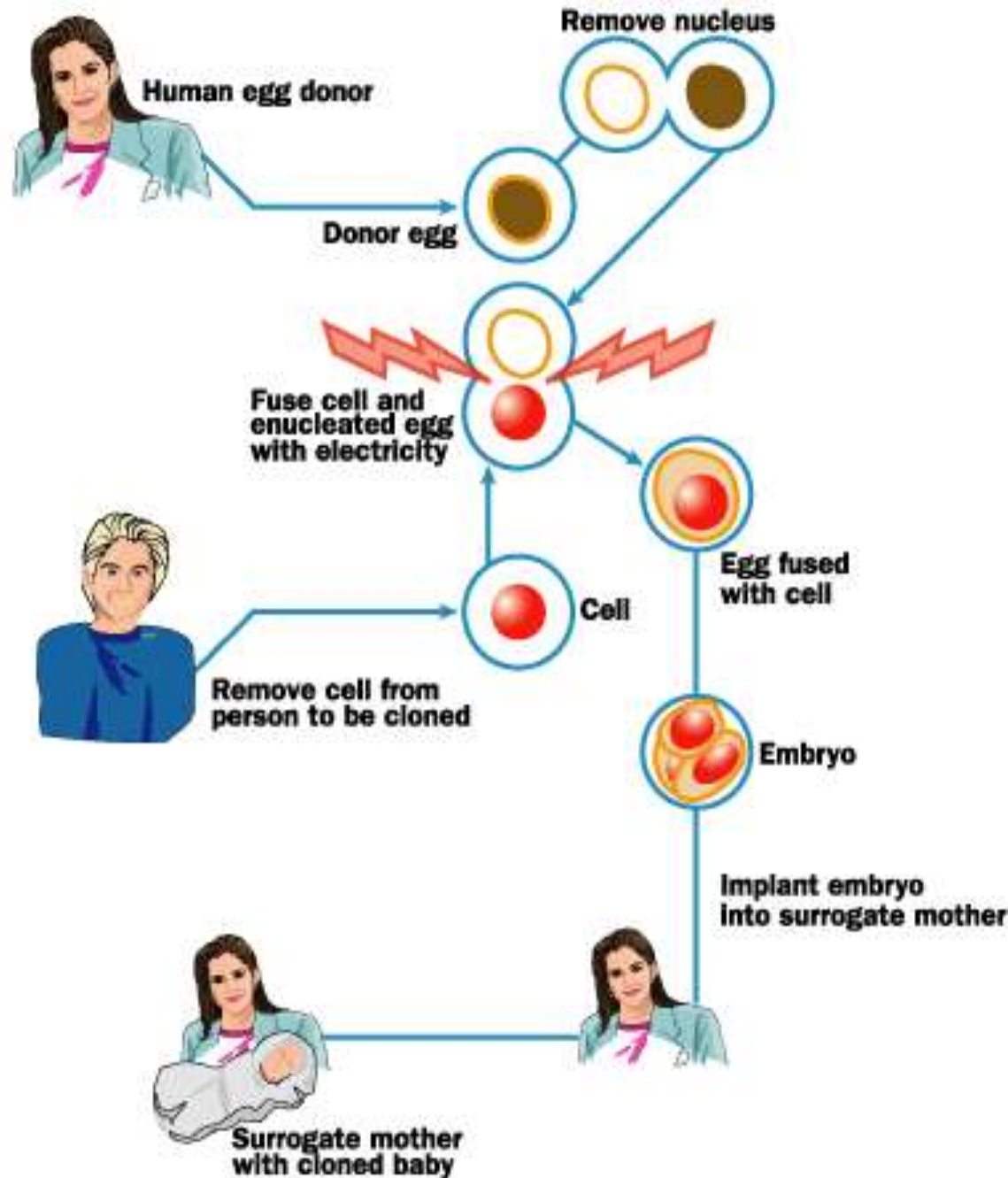


# Cloning Process

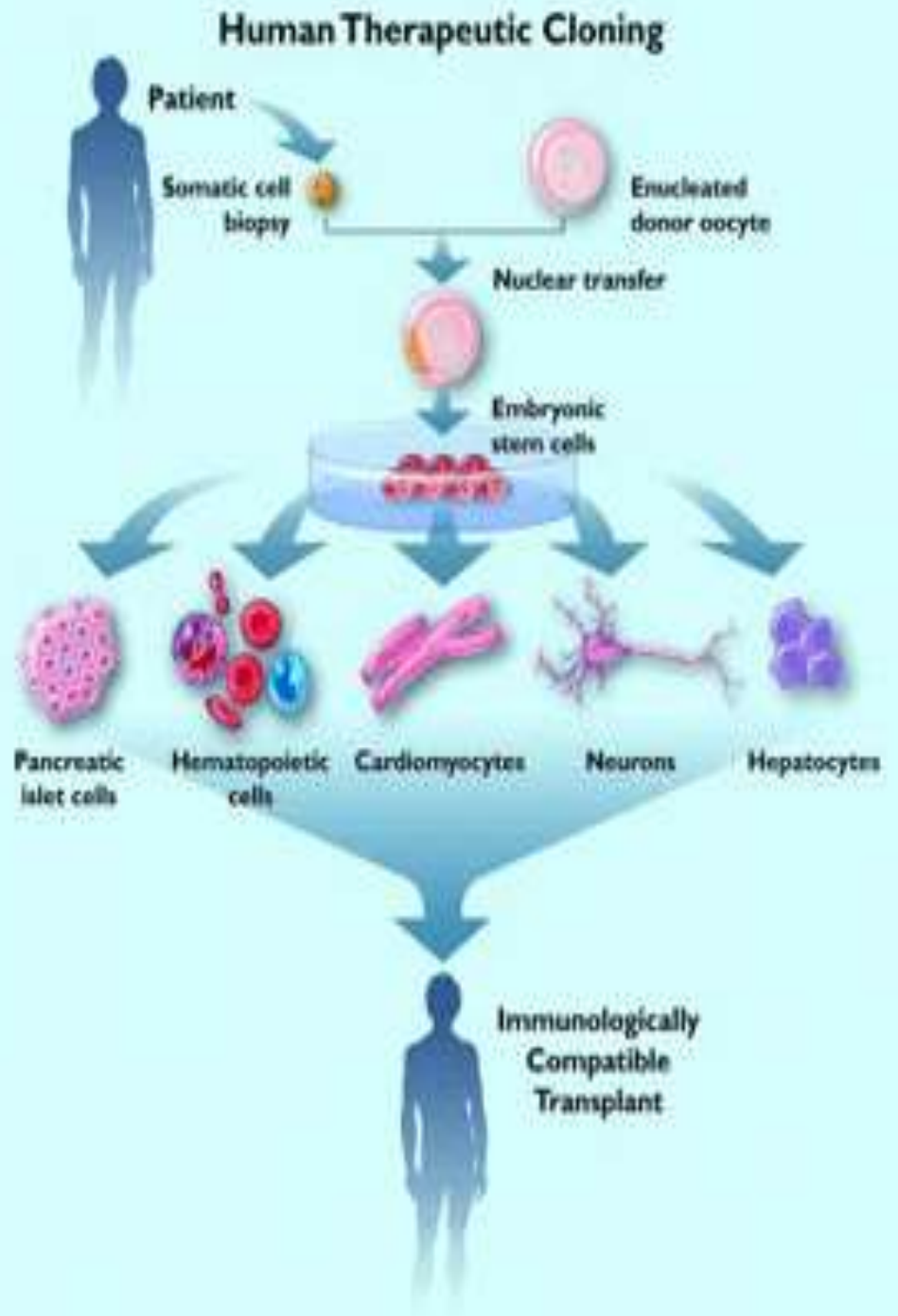
## ❖ Reproductive Cloning



# Reproductive Cloning in Human



# ❖ Therapeutic Cloning





# Case Example

## Therapeutic cloning for diabetes

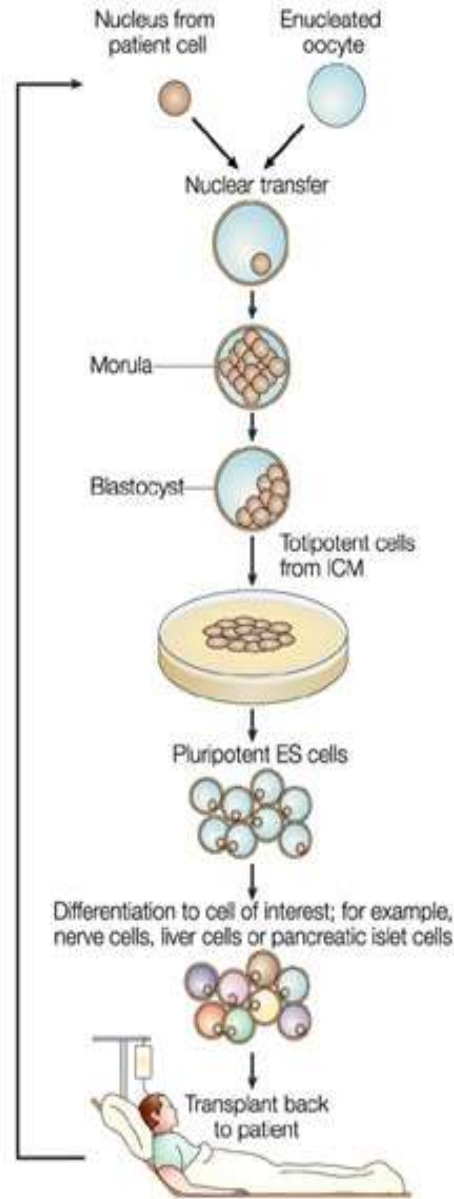
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Require the following steps:

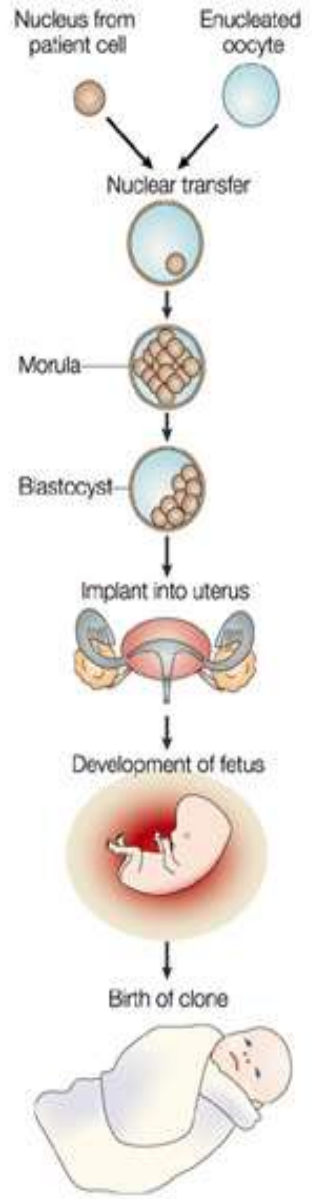
- A = DNA from Donor with Diabetes (e.g. Ali's DNA) from a Skin Sample.
- B = Egg from his healthy female family member (e.g. Fatima's Egg). Remove DNA from Fatima's Egg until only Cytoplasm remains.
- C = Put in Ali's DNA into Fatima's Cytoplasm, and produce Embryo by growing it in the Petri Dish into Stem Cells after 5 days.
- D = Then, Ali's Stem Cell goes back to Ali's pancreas with Diabetes. Then, he can produce new pancreatic cells and Ali's Diabetes will be cured eventually without rejection.

# Comparison

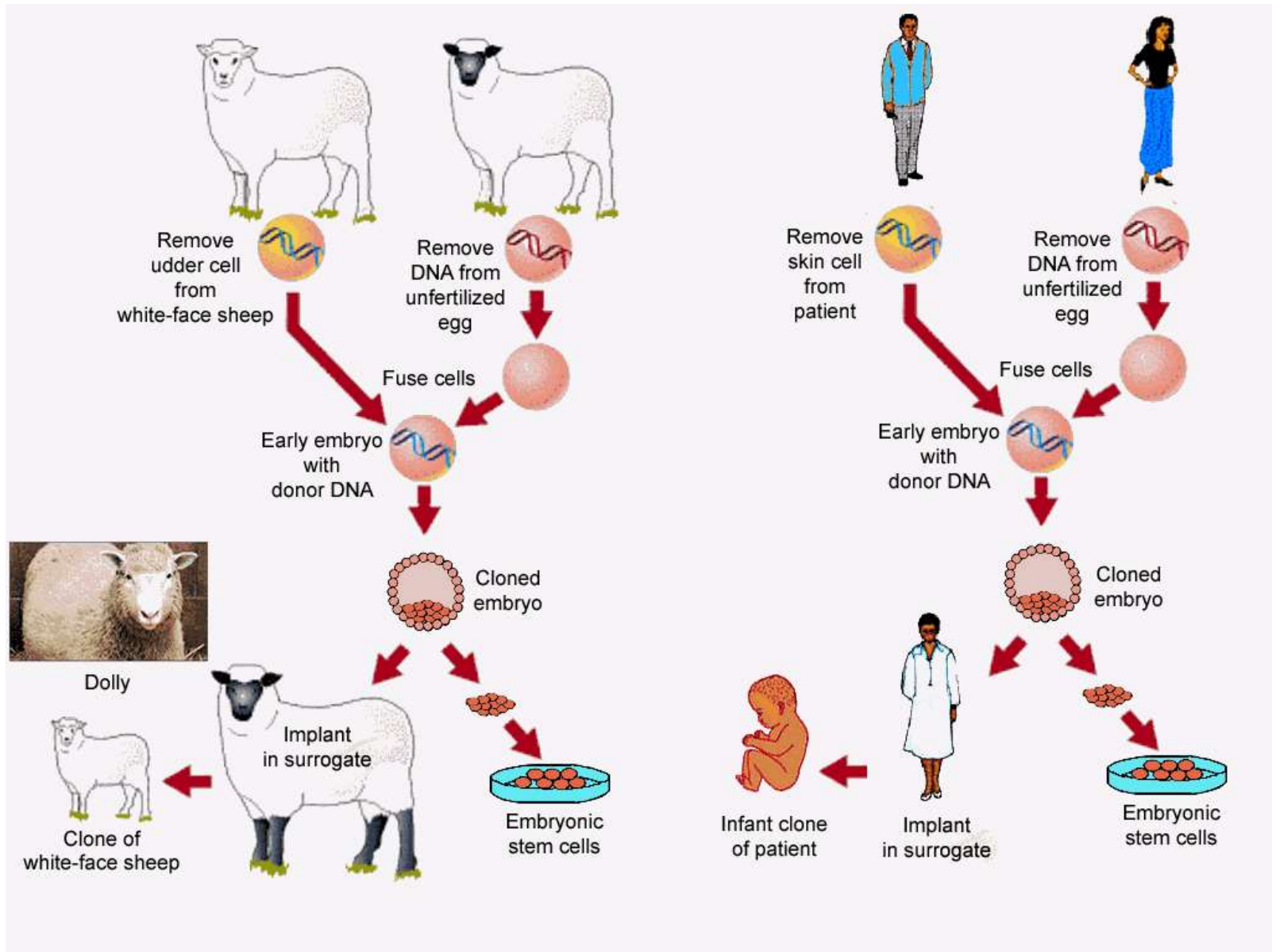
## a Non-reproductive (therapeutic) cloning



## b Reproductive cloning



# Cloning in animal and human



# Advantages & Disadvantages of Cloning

## ADVANTAGES:

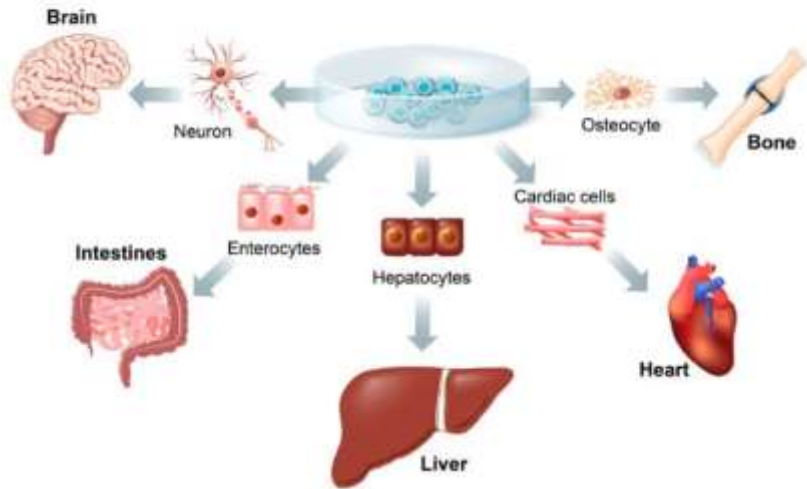
### 1. Potential benefits to modern medicine

- cell replacement therapy
- Auto organ transplant
- Drug testing material
- Animal models of disease
- Cancer therapy

### 2. Helping infertile couples

Cloning offers couples dealing with fertility the chance to have a child of their own

# STEM CELL



## Growing organs for transplant





### **3. Protecting Endangered Species**

some species are nearing extinction. The successful cloning of Dolly represents the first step in protecting endangered wildlife.

### **4. Improving food supply**

Cloning could provide a means of cultivating plants that are stronger and more resistant to diseases, while producing more. The same could happen to livestock

# Applications: Farm Animals

## Company Ready to Sell Cloned Cow Milk

CHICAGO, July 16

By Jennifer Mitol

An experimental dairy farm in Wisconsin is producing some of the world's first milk from a herd of 21 cloned cows, 17 of them from the same original animal, all genetically identical. (July 2013)



TODAY | October 02, 2012

### Cloned cow produces reduced allergy milk

Researchers in New Zealand say a genetically engineered cow is creating milk free of the protein that causes allergies in children. TODAY.com's Dara Brown reports.

## DISADVANTAGES:

### 1/The Element of Uncertainty

many embryos were destroyed before the desired result was achieved. The process started with **277** eggs, and Dolly was the single successful outcome.

### 2/Inheriting diseases

A human clone would therefore inherit the genetic traits of its predecessor. This includes genetic abnormalities and diseases. Dolly the sheep for example exhibited signs of what some suggested were premature aging

### 3/The Potential for Abuse

If a couple has a clone that they are not happy with, what would they do next?

# Dolly

Born July 1996;  
Announced 1997

One of  
434 fused  
Oocytes

Process  
Repeated  
277 times!



Dolly & her  
Oocyte/  
Gestational  
Mother

Is Dolly fully functional?

**Produced from an ADULT cell!!**

# Dolly with her three lambs born April 1998



Dolly and Bonnie

Dolly was mated normally and gave birth to 3 lambs



# Dolly's Life Span

Friday, 14 February, 2003, 20:28 GMT  
**Dolly the sheep clone dies young**

**First cloned sheep Dolly dies at 6**

**Valentine's Day  
Proves Fatal for  
Dolly**

Nature **421**, 776 (20 February 2003) | doi:10.1038/421776a

Dolly's death leaves researchers woolly on clone ageing issue

Friday, 14 February, 2003, 20:28 GMT

**Dolly the sheep clone dies young**

**Dolly's death raises big questions**

Broadcast Date: Feb. 14, 2003

# Islamic Perspectives on Cloning

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The purpose of cloning in plants and animals is to improve the quality and productivity and to find the natural medicine, especially for chronic disease

➔ *The efforts to improve the quality of plants and to increase the productivity of animals are fine according to syara', classified as **mubah***

→ *The use of animals and plants in order to seek for medicine for various diseases is allowed by Islam, classified as **sunah** as seeking for cure is sunah*

Imam Ahmad from Anas RA had reported that Rasulullah SAW spoke:

*“Actually everytime Allah Azza Wa Jalla create a disease, He also create the cure, so seek for cure.. “*

# Human Cloning

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Cloning that is performed on man or woman in order to improve the quality of the children, for example to have smarter, stronger, healthier, better physical appearance and also in order to have more children thus will increase the number of the people in a nation or country is forbidden, classified as **haram** according to islamic law.

# The haram daleels

1. The children from the cloning process are created from non natural process

## ❖ QS An Najm 45-46

“And that He creates the two mates - the male and female - From a sperm-drop when it is emitted’

وَأَنَّهُ خَلَقَ الزَّوْجَيْنِ الذَّكَرَ وَالْأُنثَىٰ مِنْ نُطْفَةٍ إِذَا تُمْنَىٰ

*“dan Bahwasanya Dialah yang menciptakan berpasang-pasangan laki-laki dan perempuan, dari air mani apabila dipancarkan.” (QS. An Najm : 45-46)*

## ❖ QS Al Qiyamah 37-38

*“He should bear in mind that he has passed through various stages of evolution to attain the human form. In the beginning he was a drop of semen which was dropped in the womb; Then in the mother's womb He formed it into an embryo that was suspended and by various combinations, and fashioned it into an excellently proportioned shape”*

*“Bukankah dia dahulu setetes mani yang ditumpahkan (ke dalam rahim), kemudian mani itu menjadi segumpal darah, lalu Allah menciptakannya, dan menyempurnakannya.” (QS. Al Qiyaamah : 37-38)*



2. Cloned children from a woman only will not have a mother, and on the contrary, from a father only will not have a mother as surrogate mother will not count as a real mother. This is considered as taking human being for granted.

### **QS Al Hujurat: 13**

*“O mankind, indeed We have created you from male and female...”*

يَا أَيُّهَا النَّاسُ إِنَّا خَلَقْنَاكُمْ مِنْ ذَكَرٍ وَأُنْثَى

*“Hai manusia, sesungguhnya Kami menciptakan kalian dari seorang laki-laki dan seorang perempuan.” (QS. Al Hujuraat : 13)*

## QS. Al Ahzaab : 5

Call them by [the names of] their fathers; it is more just in the sight of Allah

“Panggillah mereka (anak-anak angkat itu) dengan (memakai) nama bapak-bapak mereka.” (QS. Al Ahzaab : 5)

3. human cloning will erase the nasab. In fact, nasab is important and must be carefully maintained.

Hadith from Ibnu 'Abbas RA, reported that Rasulullah SAW had declared:

*“Siapa saja yang menghubungkan nasab kepada orang yang bukan ayahnya, atau (seorang budak) bertuan (loyal/taat) kepada selain tuannya, maka dia akan mendapat laknat dari Allah, para malaikat, dan seluruh manusia.” (HR. Ibnu Majah)*

4. Producing children through the cloning process will prevent many shariah laws, such as ***marriage, nasab, nafqah, right and obligation*** between children and parents, ***mahram, inheritance, child care***, etc. Furthermore, cloning will mix up and errase the nasab, this is againts the fitrah of human in the childbirth

# Cloning according to MUI

National Meeting VI , 23-27 Rabi'ul Akhir 1421 H. / 25-29 Juli 2000 M.

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➔ *“Human cloning in every way that will result in the multiplication of human is **haram**”*

## QS Al Mukminum 12-14

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"And certainly We created man from an extract of clay,"

"Then We placed him (as a drop of) sperm in a safe lodging;"

Then We made the sperm-drop into a clinging clot, and We made the clot into a lump [of flesh], and We made [from] the lump, bones, and We covered the bones with flesh; then We developed him into another creation. So blessed is Allah , the best of creators.



*“Dan sesungguhnya Kami telah menciptakan manusia dari saripati (berasal) dari tanah. Kemudian Kami jadikan saripati itu air mani (yang disimpan ; dalam tempat yang kokoh (rahim). Kemudian air mani itu Kami jadikan segumpal darah, lalu segumpal darah itu Kami jadikan segumpal daging, dari segumpal daging itu Kami jadikan tulang belulang, lalu tulang belulang itu Kami bungkus dengan daging Kemudian Kami jadikan dia makhluk (berbentuk) lain. Maha sucilah Allah, Pencipta Paling baik” (QS. al-Mu’minun (23): 12-14).*

# How about therapeutic cloning?

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## **Pros...**

according to the Sharia, reproductive cloning of people is forbidden. Cloning of animals and plants, however, are viewed as permissible

Those endorsing therapeutic cloning among the Islamic jurists see the destruction of embryos as permissible according to the Sharia legal principle of the common good (maslaha).

# Cons...

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**Some Islamic scholars, have raised objections, however, against therapeutic cloning, because it entails the destruction of embryos.**

# In between..

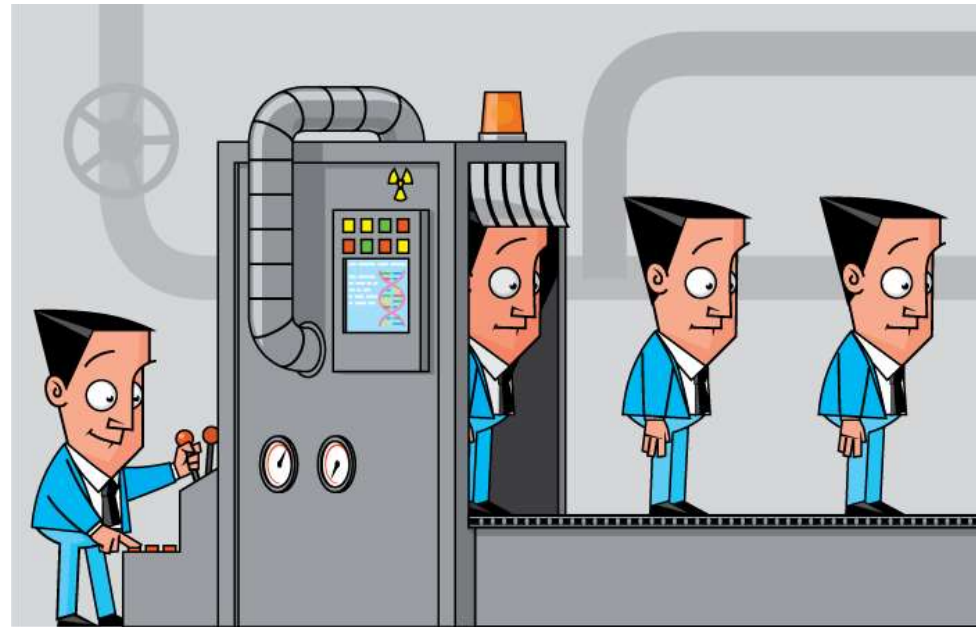
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only the **'direct cloning' of organs is permissible**, whereas the production and destruction of embryos or "living replacement part storage units" is forbidden by the Sharia. By "direct cloning" he means **the culture of tissue engineering, presumably in an animal organism**

# Closing....

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- Cloning, like so many other issues that have faced modern science, must be carefully evaluated.
- There will always be detractors, those who feel that anyone involved in cloning is playing God. And this may not be too far from the truth.
- However, any discussion on cloning must be looked at in the context of its inherent value to mankind.





# Thanks



# References

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