

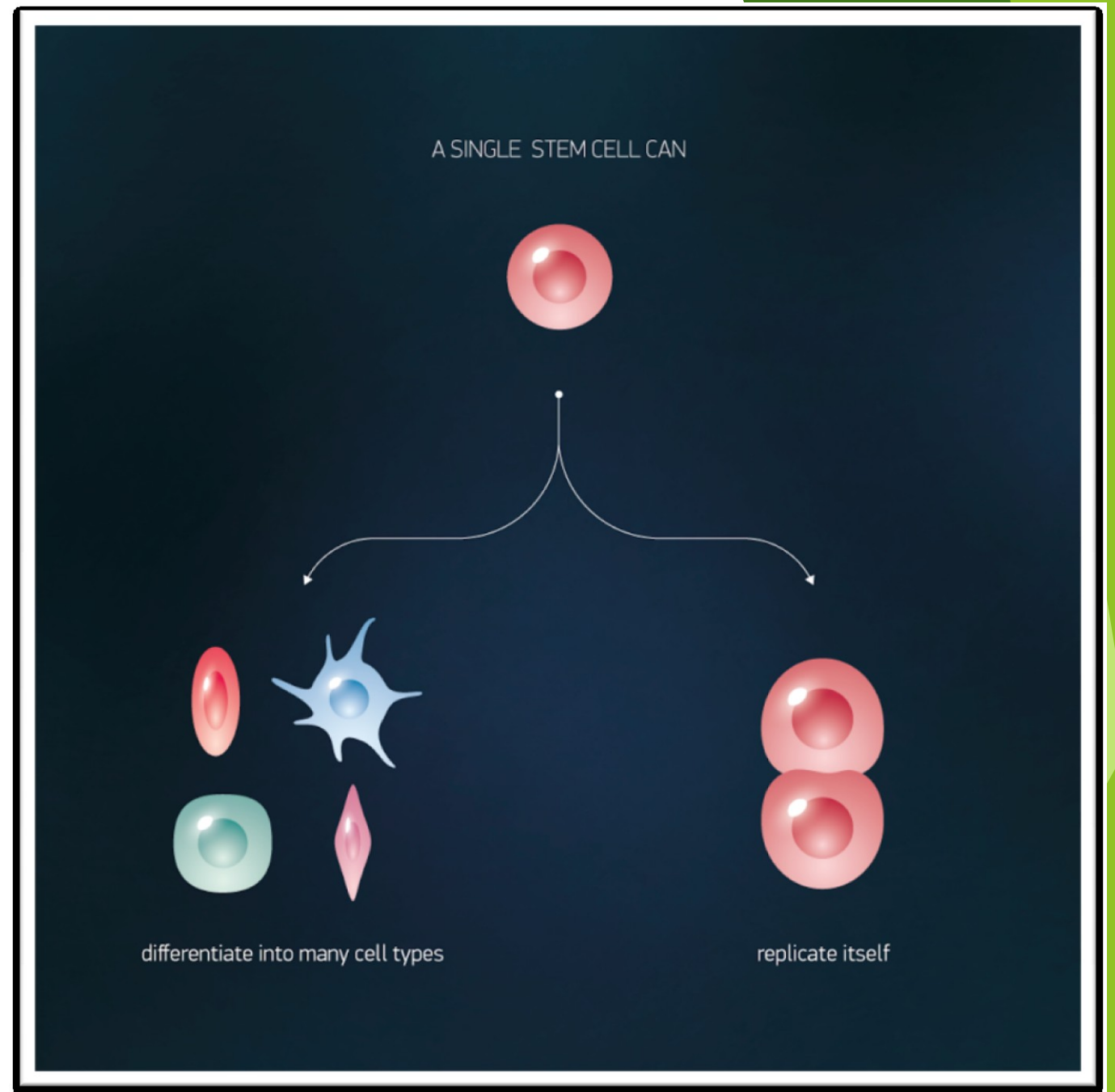
# Stem cells

Student names redacted



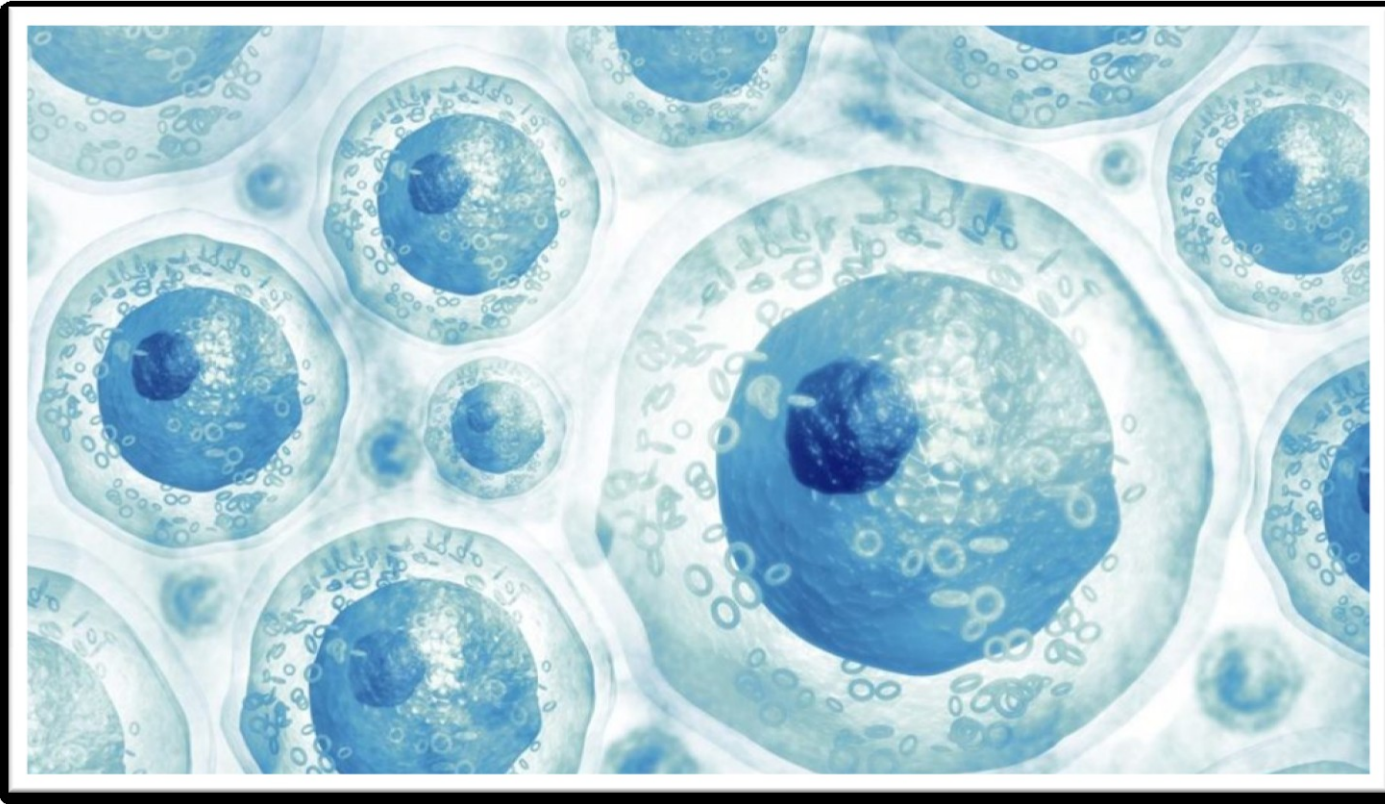
# What are stem cells?

- ▶ Undifferentiated cells
- ▶ Ability to:
  - ▶ DIVIDE
  - ▶ DIFFERENTIATE

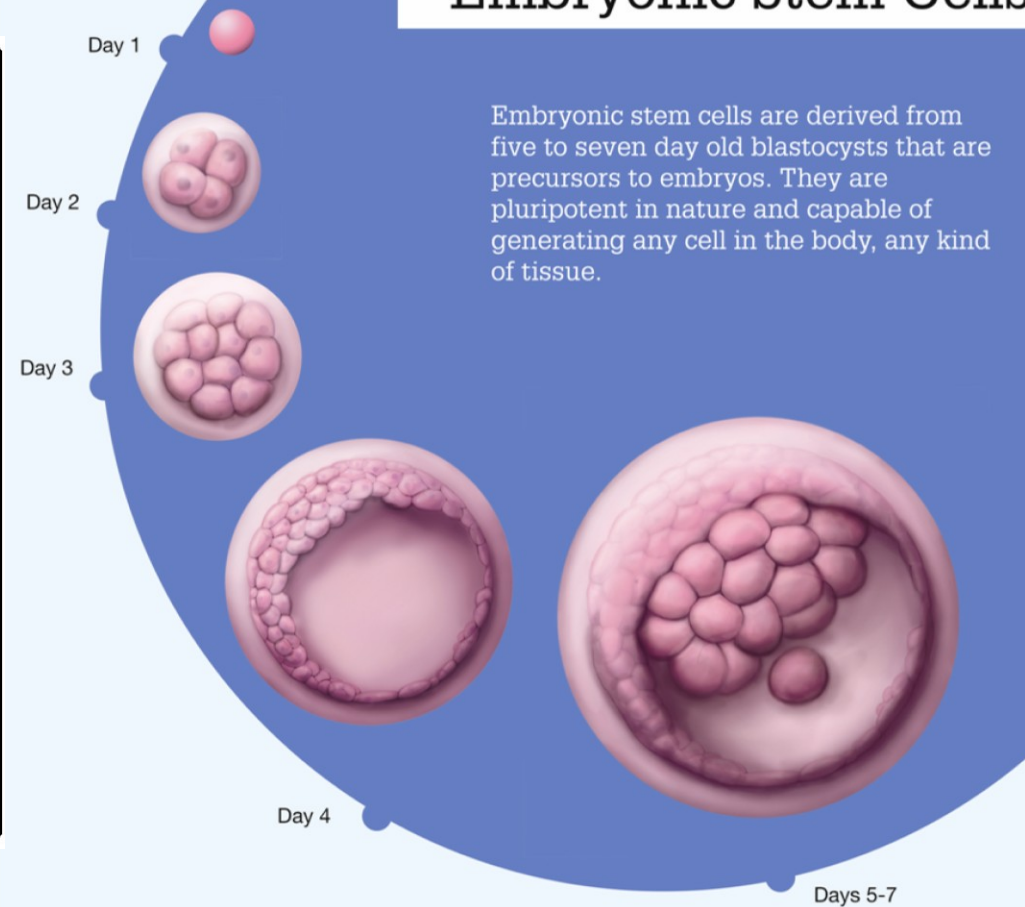


# Types of stem cells

1. Embryonic stem cells - blastocyst >> pluripotent cells
2. Adult stem cells >> multipotent

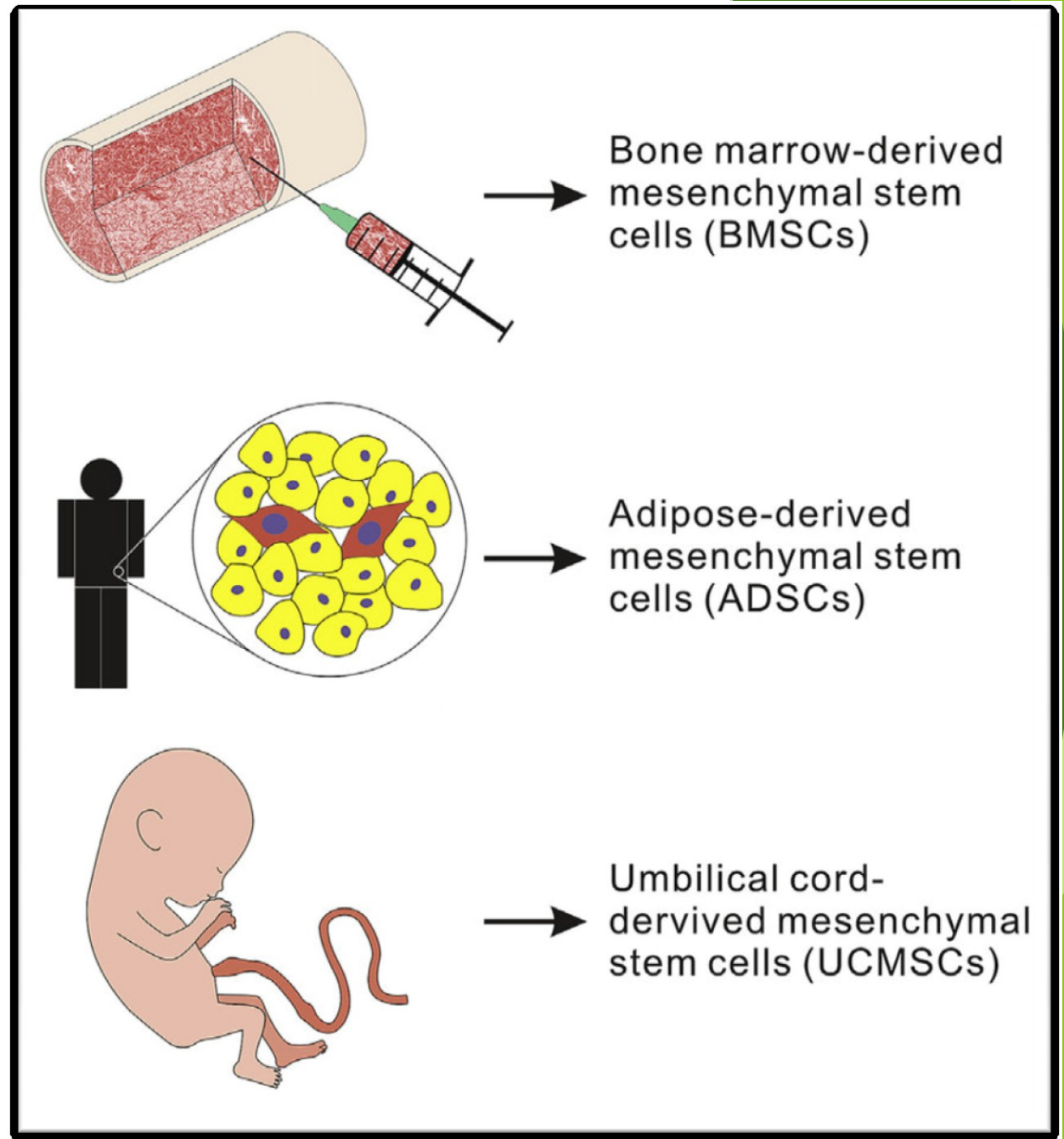


## Embryonic Stem Cells



# Sources of stem cells

- ▶ A bone marrow
- ▶ An adipose tissue
- ▶ Blood
  
- ▶ Umbilical cord
- ▶ Amniotic sac
- ▶ Skin

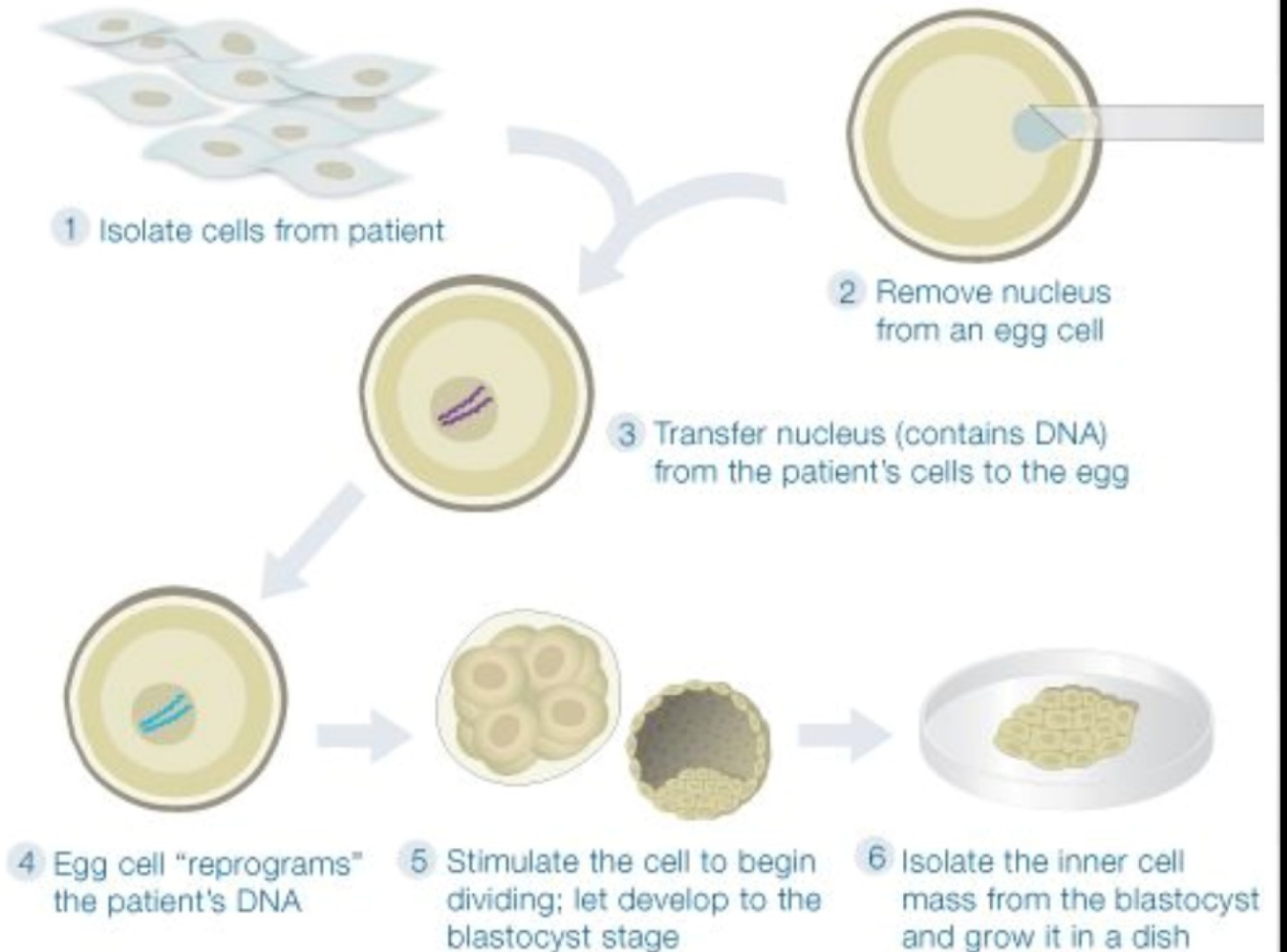


# How can we get stem cells?

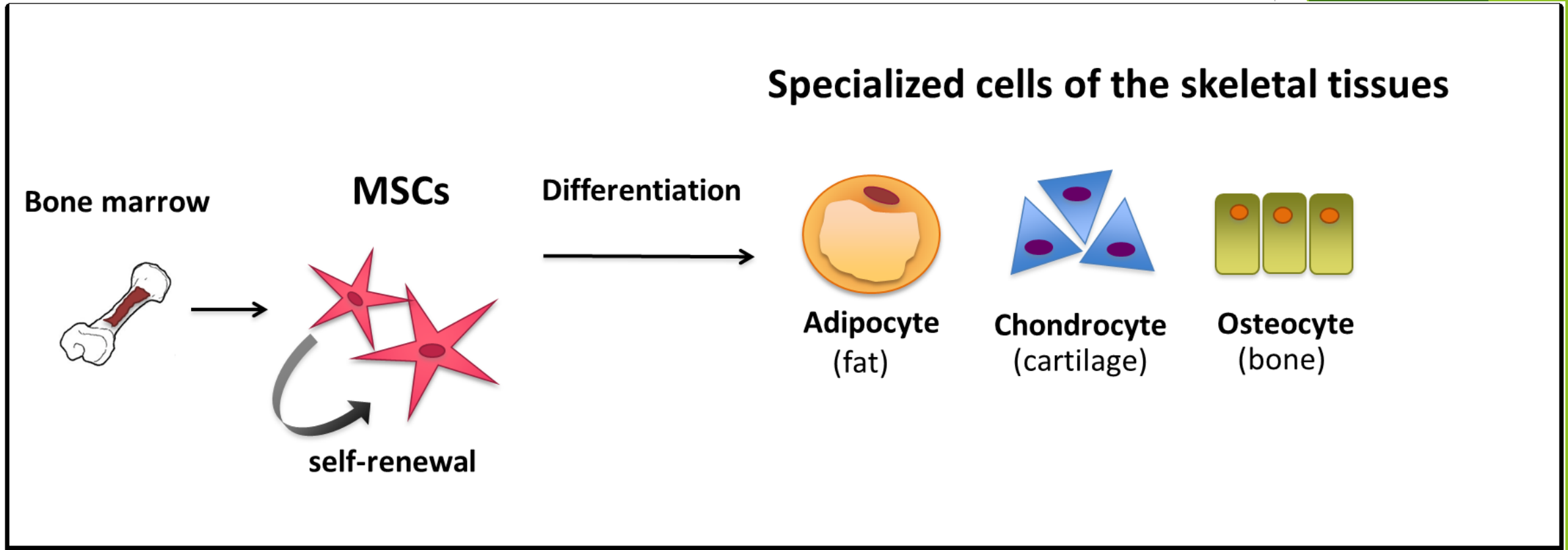
## ► Therapeutic cloning

### Creating **ES cells**

through therapeutic cloning  
(somatic cell nuclear transfer)

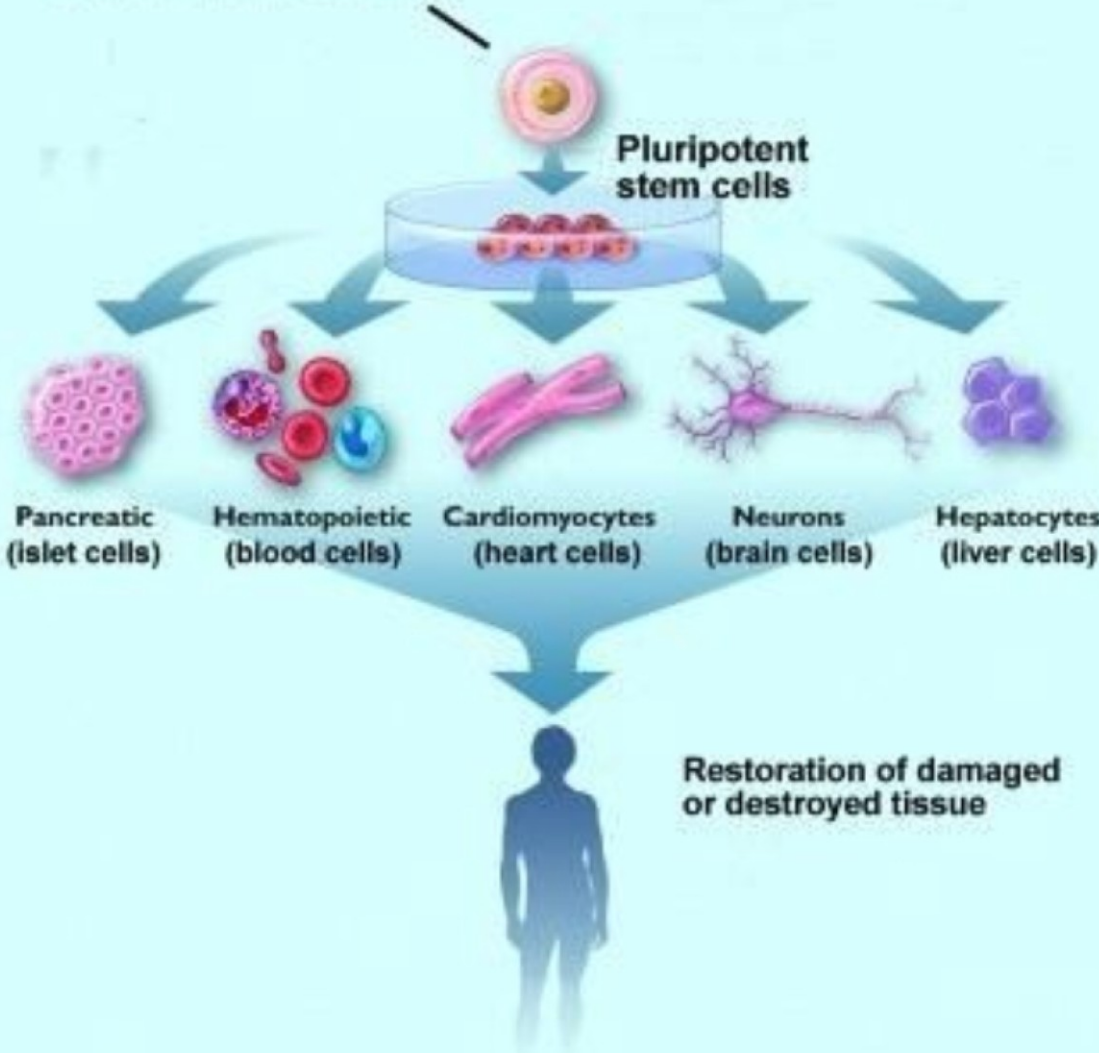


► The mesenchymal stem cells

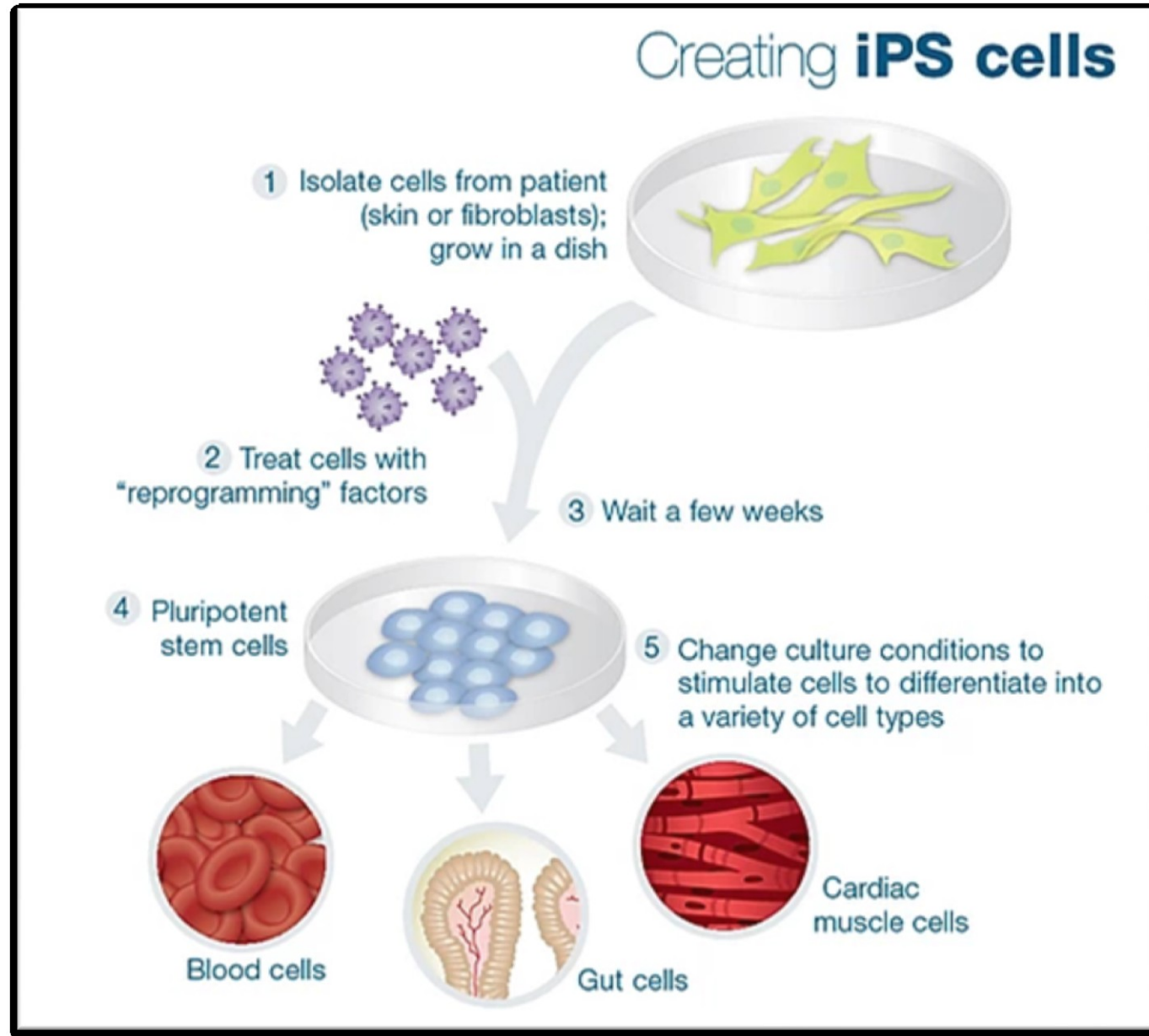


# Stem Cells From In Vitro Fertilization (IVF)

Unused, frozen embryo,  
slated to be thrown away



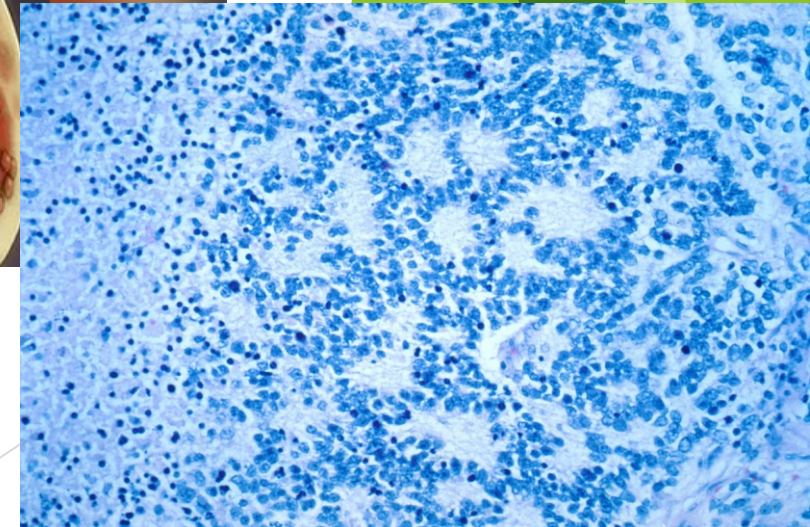
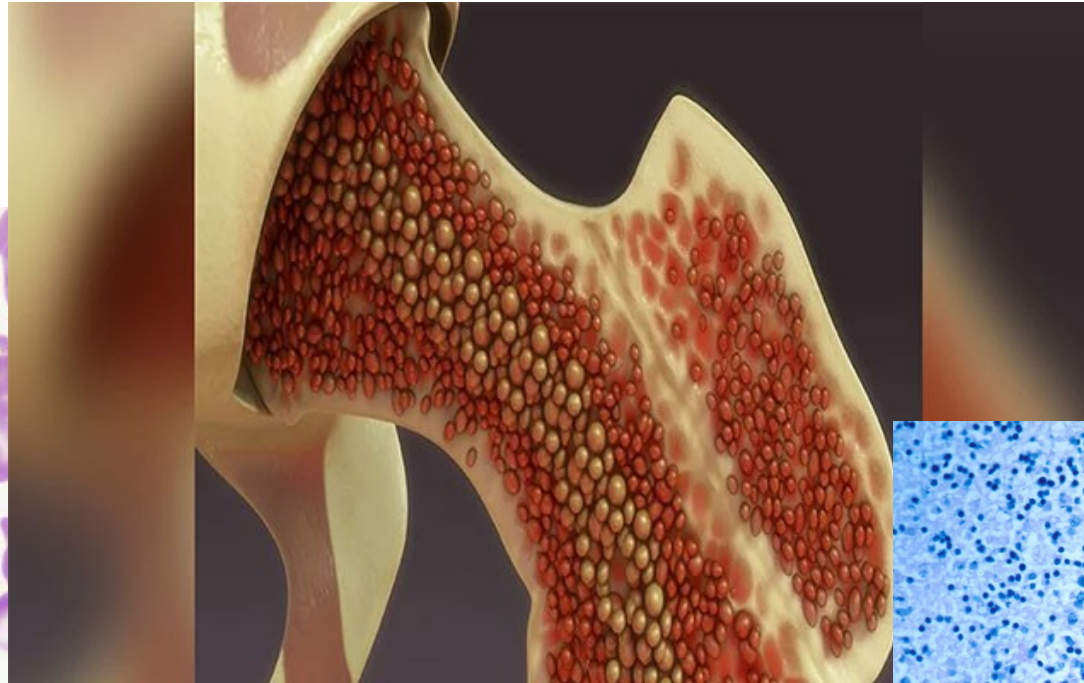
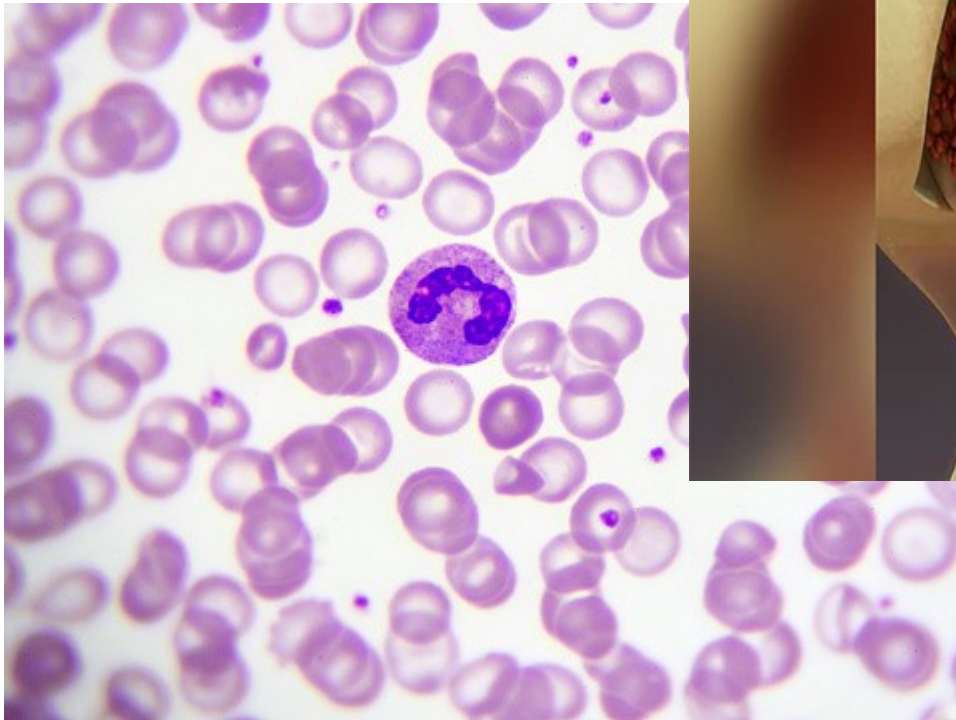
► Induced pluripotent stem cells





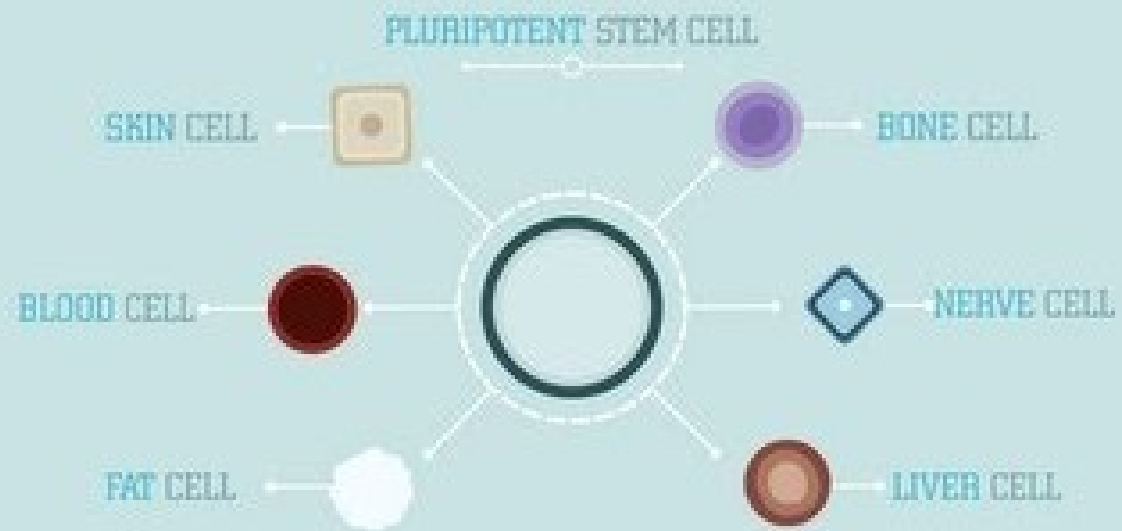
# How can we use stem cells?

- ▶ Lymphoproliferative diseases
- ▶ Cancer of a bone marrow
- ▶ Neuroblastoma



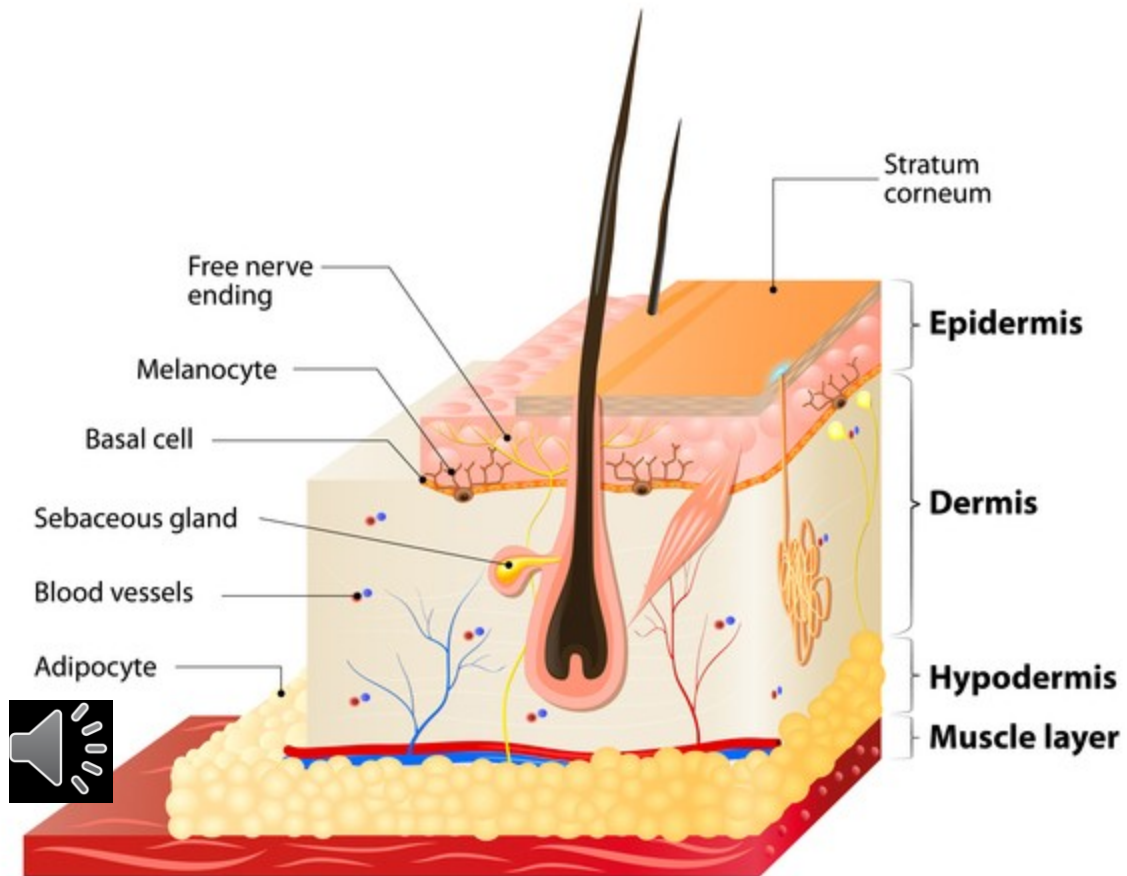
# Cellthera Clinic Clinical trials





# Stem cells in action...

## Junctional epidermolysis bullosa



# Heroes...



Professor Dr Tobias Hirsch



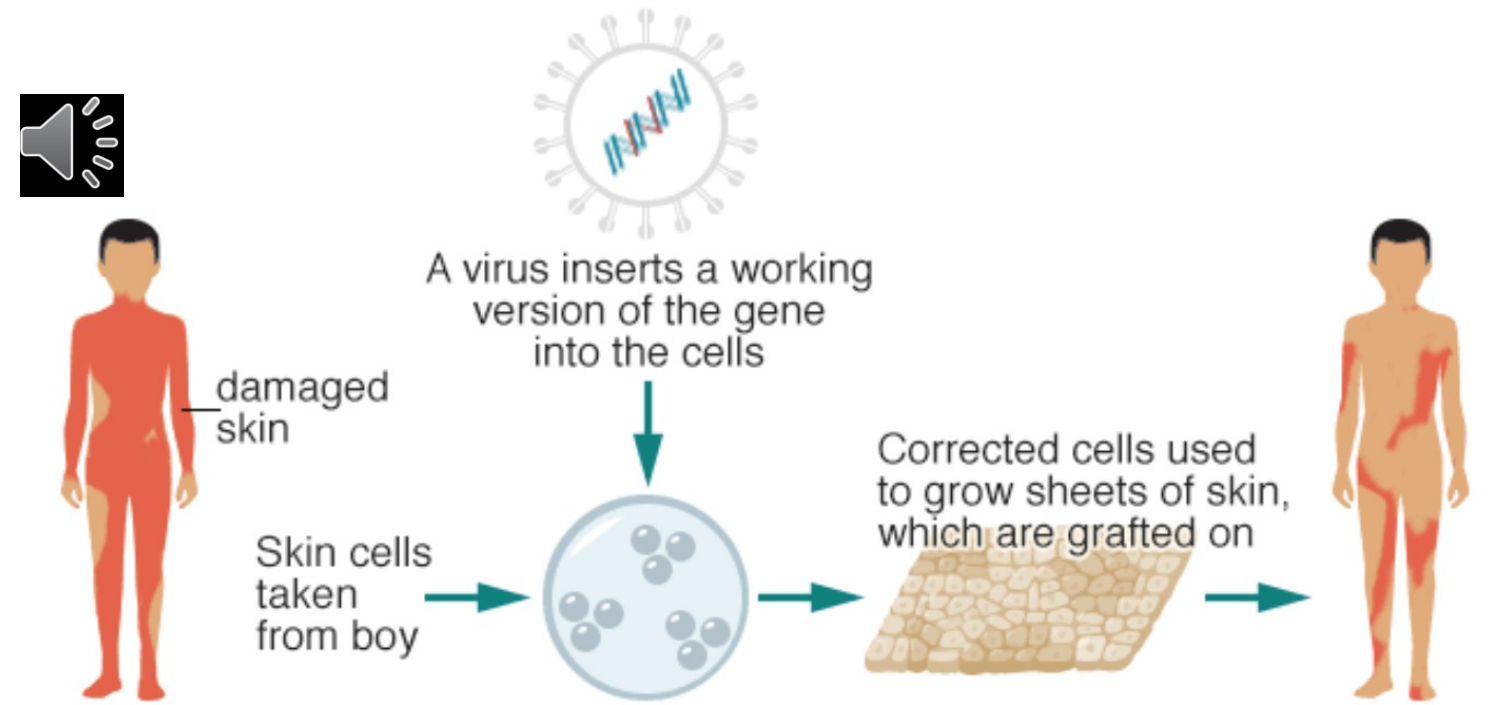
Dr Tobias Rothoefl



Prof. Michele De  
Luca



# Hard working...



And happy ending

The new skin will last his whole life.



Let's take a look back at what we've spoken about...

Ability to divide

Ability to create more than one specific tissue

Stem cells:

- Embryonic
- Adult





Thank you for  
your attention

