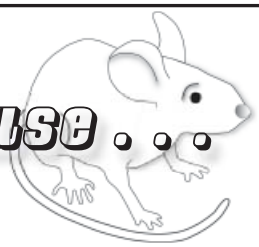


Let's Clone a Mouse, Mouse, Mouse . . .

Activity Instructions - Page 1

FIRST, A LITTLE HISTORY:

In 1996, Dolly the sheep became the first mammal to be cloned by transferring the nucleus from an adult somatic cell into an enucleated egg cell. To confirm that Dolly was truly a clone, researchers at the University of Hawaii used a similar process in 1998 and ultimately cloned 50 mice. In this activity you will simulate their steps of somatic cell nuclear transfer to produce an exact clone, or genetic copy, of a mouse.

MATERIALS:

- Lab Benchtop illustration with 4 Petri Dishes
- Mice Cut-outs page
- Crayons, colored pencils or markers
- Scissors
- Tape

INSTRUCTIONS:

1. Color the cells as follows:
   - Cumulus Cell Nucleus and Cumulus Cell, blue
   - Egg Cell Nucleus and Egg Cell, blue
   - Morula (the ball of cells), green

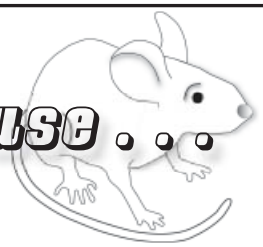
2. Color the three large female mice as follows:
   - Somatic Cell Donor, brown
   - Egg Cell Donor, black
   - Surrogate Mother, white
   - Don't color the Mouse Pup just yet

3. Cut out the mice and the Morula, and spread them out in front of you.

4. From the brown mouse (the Somatic Cell Donor), cut out the Cumulus Cell and place it in Petri Dish 1.

5. From the black mouse (the Egg Cell Donor), cut out the Egg Cell and place it in Petri Dish 2.

6. Cut out and discard the nucleus from the Egg Cell in Petri Dish 2. Do not remove any of the cytoplasm.



Let's Clone a Mouse, Mouse, Mouse . . .

Activity Instructions - Page 2

INSTRUCTIONS - Continued:

7. Place the enucleated Egg Cell in Petri Dish 3.

8. Cut out the nucleus from the Cumulus Cell in Petri Dish 1, making sure that no cytoplasm is left surrounding the nucleus.

9. Place the Cumulus Cell Nucleus into the enucleated Egg Cell in Petri Dish 3, and tape them together on the back.

10. Tape (on the back) the Egg Cell with the newly replaced nucleus onto Petri Dish 4 and let it rest for about 2 minutes. This waiting time represents the 1 to 6 hours that the new nucleus needs to successfully adjust to the Egg Cell.

11. The new Egg Cell needs to be chemically stimulated in order to divide and grow into an embryo. To represent this chemical activation, color Petri Dish 4, including the new Egg Cell, entirely with yellow (the yellow color over the new Egg Cell should hint at a green color).

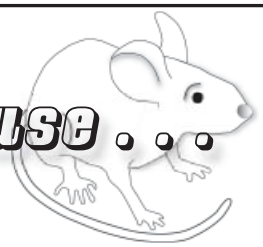
12. After it is chemically stimulated, the new Egg Cell divides into a ball of cells called a Morula. Cover the new Egg Cell with the Morula (colored green).

13. After the new Egg Cell divides into a Morula, it is placed into the Womb of the Surrogate Mother mouse (colored white). Tape the Morula into the Womb of the Surrogate Mother.

14. After about 19 days, the Surrogate Mother mouse will give birth to a new Mouse Pup.

15. Which adult mouse will the Mouse Pup resemble? What color will it be? Color the newly delivered Mouse Pup this color.

16. Clean your lab station and answer the Activity Questions.



Let's Clone a Mouse, Mouse, Mouse . . .

Activity Instructions - Page 1

1. What does the Nucleus contain? What role do its contents play in the cell?

2. What is the purpose of the Somatic Cell Donor?

3. What is a Somatic Cell?

4. What is the purpose of the Egg Cell Donor?

5. What is the major difference between a somatic cell and an egg cell?

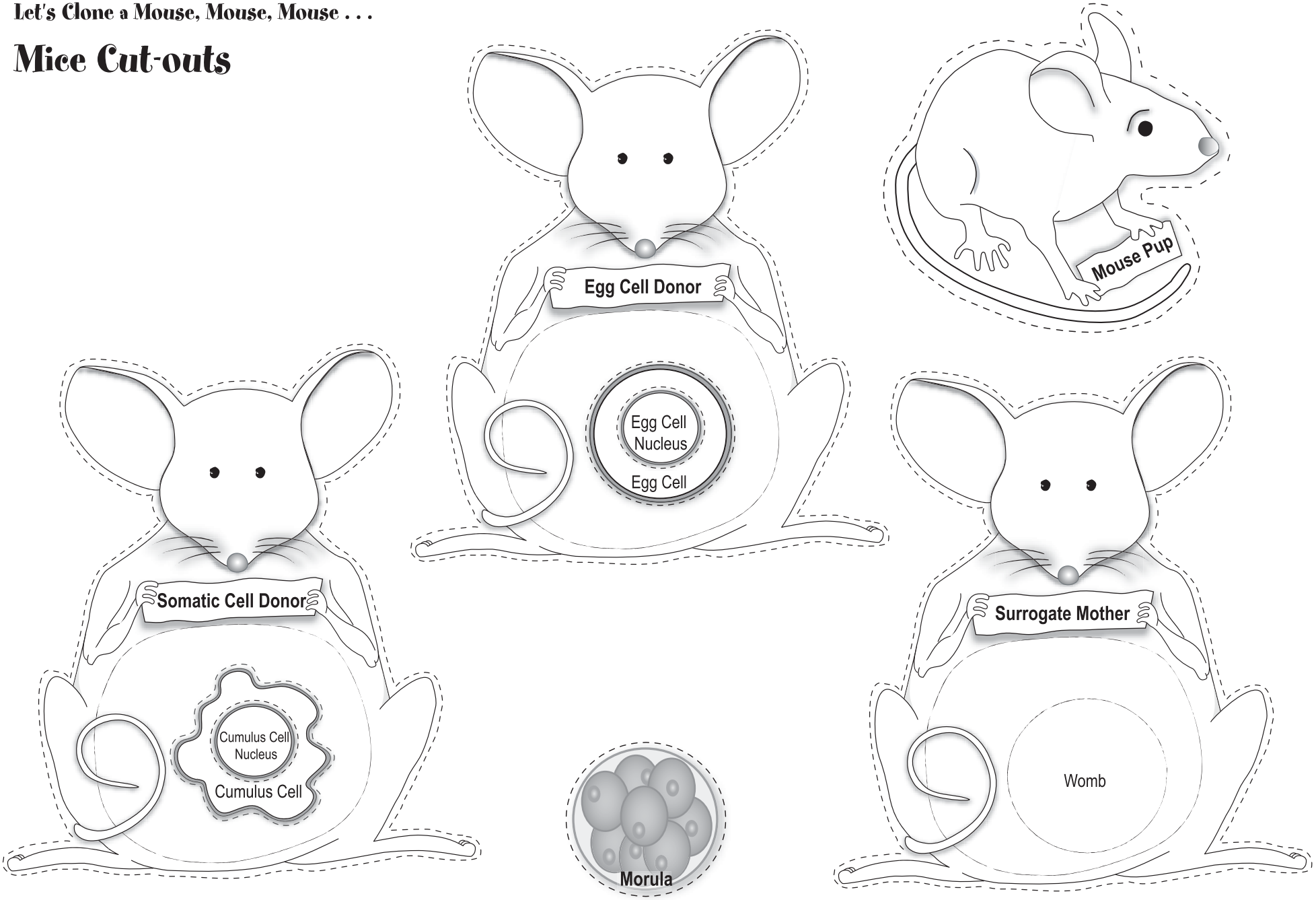
6. What is the purpose of the Surrogate Mother?

7. What color did you color the Mouse Pup? Why?

8. What gender (male or female) will the Mouse Pup be? Why?

9. How is this method of cloning different from artificial embryo twinning?

Mice Cut-outs



Lab Benchtop