

# „ETHICS AND THE NEW GENETICS“

## DISCUSSION

In the book „The universe in a single atom“ His Holiness the Dalai Lama calls attention to think about the far-reaching consequences of the genetical knowledge. Its technical application can have a big impact on our lives as human beings and for every living being on earth.

Every one of us has to think about the consequences of such applications and consider if these consequences are in harmony with our principle values as a human being.

Therefore every one of us should have basic knowledge about genetics that helps to build a well-founded opinion upon genetic applications.

We want to focus on some genetical technics and look at the possible chances / risks we have to face while applying them. Furthermore we have to be clear which ethical values should be considered. Finally we reflect if these chances / risks are in accordance with our ethical values and proof strictly if the motivation of applying it is in harmony with our ethical values.

### 1. MANIPULATION OF GENES

= alteration of **one or many genes** in an organism

**A) Manipulation of Somatic Cells** (all cells except the germ cells):

→ the altered genes „disappear“ with the death of the organism

„**Purpose**“ in humans: Cure a particular genetic disorders of an individual

**Ethical considerations:** There is no reason- as far as I can see- that would oppose an application.

**B) Manipulation of germ cells** (e.g. sperm cell/ ovum)

.....→ the altered genes stay in the Population over many generations, perhaps „forever“

**In humans forbidden by law!**

“**Purpose**” in Plants: Production of plants that carry a gene...

1. ...that makes them resistant against certain micro organisms or other pests.
2. ...that makes them more durable.
3. ...that makes them grow bigger.
4. ...that produce certain substances with possible technical applications.

These are only a few examples of almost endless thinkable possibilities!!!

**Ethical considerations:**

The ecosystem is a very complex network of various interactions between organisms. It is almost impossible to estimate all of the consequences of such interventions. Therefore it has to be checked meticulously that the risk may be as low as possible. **Once such a manipulated organism is released in nature, there is no way back!**

Additionally one has to be clear about the motivation of such manipulations. If the motivation is to stop starvation in the world, this could be a good thing. But often it is out of pure economical interests that such manipulations are done.

## 2) GENOME ANALYSIS

Today it is possible to analyse the complete genetic information (nucleotide sequence (AGTC) in the DNA) of an organism. Thereby one can detect genetic predispositions that will/ may cause disorders in the carriers in the future.

*Reflect about chances to do “good” with such information.*

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*Reflect about risks how such information could be misused or lead to “problems”.*

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## 3) PRENATAL DIAGNOSTICS

Prenatal diagnostics means testing of an embryo for diseases or conditions before it is born. The aim is to detect genetic defects that lead to “Down syndrome”, “sickle cell anemia”, “cystic fibrosis” or many other disorders.

There are **three purposes** for prenatal diagnosis:

- 1) To enable timely medical or surgical treatment of a condition before or after birth.
- 2) To give the parents the chance to abort an embryo with the diagnosed condition.
- 3) To give parents the chance to "prepare" psychologically for a disabled child.

*Which motivations do you consider as „right“? Where do you see ethical conflicts?*

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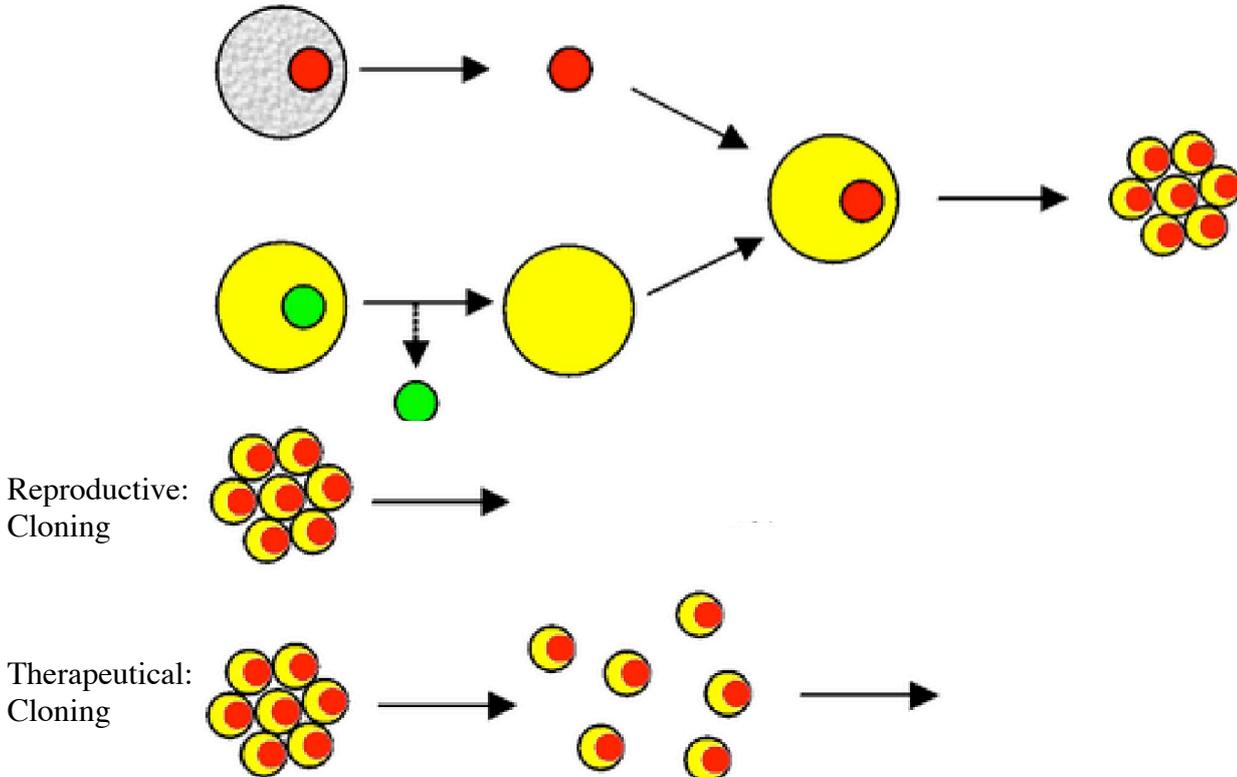
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## 4) CLONING

Cloning in biology is the process of producing genetically identical individuals. In plants this happens naturally all the time. They can also reproduce asexually.

In humans and (other) animals this can be achieved by the following procedure:



### Possible motivations for **Reproductive Cloning**:

**Example 1:** Parents without the possibility of having their own children, after trying out all the other techniques. *Would it be „their“ own child?* \_\_\_\_\_

**Example 2:** Wish of certain people to live „forever“ producing a clone from themselves. *„Living forever“ in a clone?* \_\_\_\_\_

### **Ethical considerations:**

*Should we stop the natural process of evolution? no meiosis → no gene shuffling → no (less) variation?*

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### Possible motivations for **Therapeutic Cloning**:

**Example 3:** A patient with a defective liver, due to a genetically defect. The patient's condition is getting worse and without help he would die.

### **Ethical considerations:**

*Is it acceptable to produce these „cells“, actually an early embryo that would develop into a whole organism, and then destroy them? At what time of development should we consider these „cells“ as life that has to be protected?*