Does scientific freedom need limits?

From human spare part storage to planning children

"Dolly" the sheep was born on 5 July 1996, just as lambs are usually born. However, she had been created in a test tube five months earlier by British genetic engineers as specimen "6LL3". Dolly developed from the genetic material of a body cell and not from a fertilized egg cell. Dolly was thereby the first copy of an adult sheep. It caused quite a commotion: advocates of the technology hoped that cloning would result in cures for diseases, such as cancer or Alzheimer's. Sceptics, on the other hand, warned of a horror technology that could one day allow the mass production of cloned people.

20 years later and the worries surrounding the cloned sheep have calmed down. The horrific visions of mass produced human clones have not materialised. It would be theoretically possible to produce human clones according to the Dolly principle for replacement organs, for example. However, from today's perspective, its practical implementation seems unrealistic.

Conversely, cloning plants and animals is now commonplace. It is not only in the USA and China that cloning award-winning cattle is now a lucrative business. In South Korea, resourceful business professionals even promise to resurrect beloved pets posthumously.

Everyday technology or the "ethical fall of man"?

Cloning is still a very important technology in research. It does not just concern the simple reproduction of laboratory animals, such as mice, pigs and goats. The Dolly method can also be used to create genetically modified animals with very specific characteristics. For example, we can investigate disease progression and the effects of drugs on cloned pigs with genes that cause cystic fibrosis.

Nevertheless, Dolly the sheep may have exceeded an ethical boundary: Should man create living beings in a test tube? Should man interfere with creation? And where must the limits of genetic engineering lie so that cloning does not turn into a nightmare?

It is certainly less ethically reprehensible to use gene manipulation to prevent foreseeable hereditary diseases in children. But soon quite a few people might start wanting certain characteristics for their future children: 186 cm tall and blue eyes! Or maybe even a football star?

"Therapeutic" cloning is also fiercely controversial. This is a process to cultivate tissue with the body's own genetic material. The nucleus is taken from an egg cell and replaced with the nucleus of a cell of the person for whom the genetically identical tissue is being produced. The egg cell divides in the test tube several times, therefore growing until it reaches an early embryonic stage. After a few days, embryonic stem cells can be removed. They can develop

to any tissue type (e.g. liver cells) but not to a human being. It is hoped that this tissue will help to cure various diseases.

Very varied legal positions

Should a person be allowed to interfere in the egg cell if this can be used to cure sick people? Is it, for religious reasons, irresponsible to create embryos only to destroy them again later? There are very different views on this issue in different countries. Therapeutic cloning is permitted in Great Britain, Sweden and Belgium, in the USA and many Asian countries, but is largely prohibited in Germany. According to the Embryo Protection Act and the Stem Cell Act, embryos may only be used to bring about pregnancy. However, any manipulation of an artificially created embryo is prohibited.

Exercises:

1. The UN Convention on Human Rights states that science must be “free”. What does this “scientific freedom” mean for researchers?
2. In the video clip “Science, ethics and society”, Nobel laureate Dickinson Richards says that limitless faith in man’s capabilities and the progress of science was a miscalculation. Progress has brought mankind much good, but also much suffering. What does he mean by that?
3. In 1997, “Dolly” the sheep was the first animal reproductively cloned with the aid of body cells. What do you think about the idea of cloning people? Prepare a for and against speech to present in front of the class. Six pupils will be chosen by the teacher.
4. Come up with a sketch in which an inquisitive and success-hungry scientist is shown the morally necessary limits of the completely free practice of science by an apparently naive citizen.

http://www.mediatheque.lindau-nobel.org/videos/33615/2014-mini-lecture-science-ethics-society

The term “embryo”

If an organism develops from a fertilised egg, it is called an embryo as long as it is inside the mother. After the internal organs have been formed, usually from the ninth week of pregnancy onwards, the embryo is called the foetus.

The term “stem cells”

Stem cells are cells that can multiply and differentiate. They can be used to extract specific body cells, grow organs or even “clone” entire organisms.

The term “cloning”

The word “cloning” means the creation of one or more genetically identical individual living organisms. In “reproductive” cloning, the nucleus is taken from a body cell, inserted into an unfertilized egg and the embryo is carried by a surrogate mother until birth, as in a normal pregnancy. In “therapeutic cloning”, new tissue is grown from the genetic material of an animal or human being.

“For and against speech” method

With the for and against speech, you are tasked with presenting a speech without a script in front of the class for a maximum of 3 minutes. You need to prepare for both positions because you will only find out shortly before your speech whether you should represent the for or against. You may, of course, use a cheat sheet for your speech.

