

Presidenza del Consiglio dei Ministri



Abstract

**ETHICAL ISSUES IN GENE EDITING
USING CRISPR/CAS9**

23 February 2017

The opinion analyzes the CRISPR-Cas9 technique within the context of recent, highly innovative techniques in genetic engineering, which can modify the DNA sequences of living organisms with high precision, relative ease and low cost.

Following a scientific description of the *gene-editing* technique, the document focuses on the peculiarities of the technique, its potentialities, risks and possible applications in the context of the emerging current bioethical debate in the scientific sphere.

From the discussion of the Committee there emerge some common elements as well as divergence of opinion.

The Committee is in favour of in vitro and animal testing, in accordance with international rules, in order to test the safety and efficacy of technologies and considers it ethically desirable to increase research on human somatic cells both in laboratory research as well as in clinical or in-vivo research.

As far as *gene editing* on the human germ line is concerned, it does not consider testing on gametes, intended for conception, and human embryos to be implanted, to be legitimate, agreeing on the opportunity for the moratorium on clinical research or in-vivo research, until the necessary conditions of safety and efficacy of the technique have been achieved.

The Committee expresses opposite viewpoints on experimentation regarding *gene editing* in the lab on gametes not intended for reproduction and on in vitro embryos not intended for implantation: some are in favour while others are against on the basis of opposing arguments.

A brief history of genetic engineering is provided in the Appendix to outline the context of the birth of *gene editing* and an analysis of key international documents as well as national regulation.