



## Editorial

## Ethics in science

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Science, namely in biomedicine, has been able to reach all technologic frontiers raising the question of what should be its ethical and social limits. It is true that the specific ethos of science is to contribute to make humanity better off allowing that people, all over the world, have access to the benefits of scientific evolution. Still there is no doubt that in many different settings, and at a global level, scientists have systematically disregarded basic ethical principles inherent to the human condition. Therefore, it is not surprising that in the last decades, namely after the Nuremberg trials, relevant conventions have been internationally proclaimed by different political institutions. But sharing the same ideals: to preserve the core values of humanity, especially human rights and human dignity, and obviously promoting the ideal that the interests of the subject should always prevail over the interests of science.

The Nuremberg Code, the World Medical Association Declaration of Helsinki, the Council of Europe's Convention on Human Rights and Biomedicine, the UNESCO Universal Declaration on Bioethics and Human Rights or the Council for International Organizations of Medical Sciences International Ethical Guidelines for Health-Related Research Involving Humans are some examples of the need for international regulation of science and medical research. All of them, with no exception, suggest core ethical principles that should be universally respected. They can be summarised as follows: respect for persons and the need for free, informed consent; protection of incompetent persons, namely children and psychiatric patients (surrogate decision-making, proxy consent, living will, and so on); the ethical imperative to maximise benefits and minimise harms (beneficence and non-maleficence); privacy rights and confidentiality; justice/equity in the access to healthcare and to the benefits of clinical trials; accountability of healthcare professionals and institutions delivering healthcare; and responsibilities of ethical review committees.

Clearly, many moral dilemmas are related to cutting edge technology such as embryo manipulation, stem cell research, physical, cognitive and moral enhancement, cryogenic suspension of human beings, synthetic biology, genome editing and many other scientific programs that can temper with human dignity and even with human nature. On the other hand, ethical dilemmas may arise in clinical trials namely in multicentre research projects conducted by

transnational pharmaceutical companies with the goal of developing innovative and revolutionary pharmaceuticals.

And how should humanity deal with these ethical challenges? What would be the ethical response of medicine to such dilemmas namely in a secular, pluralistic society? Indeed, different conceptions of the good are acceptable as long as the original position of the scientist is clearly stated and coherent with accepted foundational principles. Namely the ethical and legal principles endorsed by the international community.

Although the ethical regulation of science has many different forms, there is no doubt that professional autoregulation and especially personal integrity are paramount. It follows that there is a growing need to promote personal integrity as a core ethical value, both at medical training as well as throughout professional life, integrity should be valued, pursued and promoted. Both ethics committees (and institutional review boards) as well as professional organisations that regulate professional practice should be particularly aware of the importance of integrity in science and there should exist zero tolerance for deviated behaviours. It might imply a global strategy because science is propelled by huge transnational organisations, namely pharmaceutical companies. So, only truly independent regulatory bodies can defend the public interest and individual rights, namely the rights of the most vulnerable ones. Breaches of integrity can have many different faces, i.e. fabrication of data or reporting fake results, falsification research materials or changing or omitting data and even plagiarism, induced by financial gains, career progression, or institutional pressure.

Scientific journals should therefore promote more stringent guidelines in the evaluation, publication, and follow-up of the published research. As the genetic fingerprint of science is the search for the common good, the selection of referees for scientific papers is also a huge task for scientific journals because any proposed research should be evaluated in its ethical dimension and true authorships should be especially valued by the publishers. Again, zero tolerance should be the rule namely with plagiarism, manipulated data or results, or any other kind of scientific misconduct. And stringent mechanisms of accountability of the scientific community about these practices are needed, namely the public disclosure of scientists and research centres that engage in such practices.

But the ethical regulation of science should go even further. For instance the peer-review process should not only be fair and responsive but should also assure absolute confidentiality of the

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research submitted for review. Therefore, any conflicts of interest both of the researchers as well as the reviewers are of utmost importance. Conflicts of interest of any nature namely the undue influence of transnational corporations who seek to make (legitimate) profit after huge investments in research. Indeed according to Forbes the average drug developed by a major pharmaceutical company costs at least \$4 billion and it can be as much as \$11 billion. Although it should not be questioned the corporate social responsibility of pharmaceutical companies, because they fill an important

global gap in research, it is expectable (although not desirable) that sometimes maximising profit might be a compelling reason for some scientists to overcome their ethical duties.

Ethics in science is always an unfinished task. Only a joint effort of medical schools, professional associations, international regulatory bodies, and especially the personal integrity of researchers can reassure society that the ethos of science will always be the respect for the commonwealth of life.