Group of the Italian Researchers on Embryonic Stem Cells (IES Group)

Manifesto for the scientific research on embryonic stem cells:
on the ethics of a "new frontier".

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Scientific research on embryonic and adult stem cells, although still in its early years, has already opened a real "new frontier" for the development of biological sciences and medicine. Many already see that within the field a "new paradigm" is opening up, a new horizon that gives new hope. There is currently a big ferment in this field, which is quite literally revolutionizing the way to develop strategies to make available new and original weapons to fight several severe pathologies that afflict humanity.

The analogy to the "new frontier" is clarifying and enlightening for at least two reasons. **The first** consists in highlighting that research in this field tends to explore a new territory and to enlarge the boundaries of knowledge. Research on stem cells is still at the fundamental level, directed to understanding the key biological mechanisms behind the function of these cells. It is indeed important to underline that we are still in this phase, in order not to elicit false hopes and illusions for "miraculous" treatments, available any day soon. We are not there yet, although we hope we will get there in the shortest time possible. A prudent way of enhancing the chances of getting there would be to openly support research on this type of cells. Because any *a priori* prevention of further opportunities would be irrational and at odds with scientific method.

The second reason why we consider the above analogy enlightening is that it allows an understanding of the current restrictions that are already imposed upon research on embryonic stem cells: the opening of "new frontiers" has always been met with reservation and opposition; this opposition tends to intensify as challenges to entrenched knowledge and conventions strengthen. Aware of this situation, and of the many challenges that this development in the biomedical field poses to society and to various traditions (be they religious and not), we believe that these problems need to be addressed through a public discourse among people of equal rights to critically examine the different positions. Any of us can be wrong. The best way to avoid mistakes is a public discussion, carried out earnestly, calmly, impartially and fully respecting the opposing opinions that are motivated by good reasons.

As an input to such a discussion, **we hold there is a moral duty to pursue the opening of the "new frontier", because research on embryonic stem cells is an essential step towards understanding how human tissues are generated and become diseased.** In our view, the gaining of this knowledge *per se* is already ethically sound and sufficient to justify protecting the freedom of scientific research, which is also consistent with our Constitution. More specifically, scientific progress may open new perspectives in the fight against diseases, which renders the ethical value of research in this field even more relevant.

We are aware that criticism of this type of research sustains the principle of an absolute intangibility of the human embryo beginning with its fertilization. We do not intend to end this perennial debate, which is likely to continue for much longer, but we do contend that this is merely *one* specific position among others. Those who defend this position may not, however, claim the moral high ground or superiority over others who allow moral legitimacy (or even good-faith) for embryonic stem cell research; nor should they attempt to impose it by law.

We maintain that embryonic stem cell research is ethically sound and necessary, in particular when performed with cells that are already available, and otherwise destined to be destroyed or wasted. The seven Italian laboratories that perform research on embryonic stem cells make use of cells generated several years ago. Instead of wasting this opportunity to extend our knowledge, we believe it is ethically legitimate to make good use of it and enlarge the "new frontier" of biomedical science.

Although we do not share the same opinion, we respect the position and reasoning of those colleagues that avoid working with embryonic stem cells. However, **we refute those who discredit research on embryonic stem cells as *irrelevant from the scientific point of view and useless in clinical and therapeutic aspects*, and who argue that comparable results**

could be achieved through the study of adult stem cells. From a scientific perspective there is no conflict of interest: even the scientists that work only on adult stem cells acknowledge that there is no opposition or disagreement between the two lines of research, but rather complementarity and a fruitful exchange. Results obtained with one type of cell often stimulate research on other types, and vice versa, as recently exemplified by the reprogramming of adult cells into embryonic stem cells. We ourselves work with both adult and embryonic stem cells. Therefore, to create a contrast between the fields is artificial and inappropriate. From a therapeutic aspect, it is hence improper to claim a superiority *tout-court* of one line of research over others. Instead of rushing to claim therapeutic successes exclusively for one kind of research, one should be extremely cautious to avoid fostering illusions in people who suffer from severe pathologies.

Unacceptable also is the mindset that research on embryonic stem cells would be very expensive and thus reduce funds available for research on adult stem cells. This is clearly mistaken: the European Union has financially supported as many as 110 projects on adult stem cells, compared to only 7 projects which involve also embryonic stem cells, and only one that is completely devoted to embryonic stem cells. Furthermore, in Italy there is no public funding for research on human embryonic stem cells.

We seek a reorientation of the currently imbalanced situation, achievable by the resumption of public funding for research on embryonic stem cells that are already available, which is permitted by Italian law and is a basic feature of the transparent regulation applied in most European countries. Taking into account the equal scientific validity and ethical dignity of both lines of research, **we ask that access to Italian public funds is made easier and boosted in value in order to support research on embryonic stem cells,** and avoid its unfair penalization and the embarrassing situation that favours those who claim to be unwilling to make use of this research, but who at the same time benefit from results obtained by its sound and legal use.

From our side, **we strive to submit our results and projects to discussion, for this reason: public and open discussion about research-in-progress, and about the reasoning that requires us to sustain its ethical acceptability, is both an essential paradigm of the scientific method, and also an important contribution to the growth of society.**

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