

Science and politics

An interview with Elena Cattaneo, Director of the Centre for Stem Cell Research at the University of Milano, Italy

Elena Cattaneo is Director of the Laboratory of Stem Cell Biology and Pharmacology of Neurodegenerative Diseases in the Department of Pharmacological Sciences at the University of Milano, Italy. She is also the co-founder and first appointed Director of UniStem, the Centre for Stem Cell Research, hosted by the same institution. The main research themes of her lab are neural stem cells and the molecular pathophysiology of Huntington disease. Rather than analysing the deleterious effects of mutant huntingtin—the protein coded for by the Huntington gene—Cattaneo's lab focuses instead on the normal function of huntingtin. Her research has revealed that it has several beneficial functions for brain neurons that keep them alive. Thus, the damaging effects of Huntington disease might be caused not only by the toxic function of mutant huntingtin, but also by the loss of the physiological function of the normal protein.

“...I think defending the freedom of research is intrinsic to being a scientist and cannot be avoided”

Elena Cattaneo has also been at the centre of a legal action about stem-cell research in Italy. In the summer of 2009, Cattaneo and two other Italian stem-cell scientists—Silvia Garagna of the University of Pavia and Elisabetta Cerbai of the University of Florence—challenged in court the decision of the Italian government to exclude human embryonic stem-cell research from a ministerial funding call for projects on stem-cell biology. According to the scientists, they have a constitutional right to appeal against a public funding call that limits their freedom to do legal, scientifically valuable research in Italy.

EMBO reports: Why did you and your colleagues decide to sue the Italian

government over its decision to exclude research on human embryonic stem cells from an open call for proposals?

Elena Cattaneo: The original text of the public call did not exclude any type of stem cell, as was declared by one of the scientists involved in drafting it. Therefore, after embryonic stem cells were excluded from the call, we first appealed to TAR [Tribunale Amministrativo Regionale] Lazio—a regional administrative court in the Lazio region—which is able to make decisions at the national level. We were told that we were not entitled to appeal against the government's decision and that the rector of a university or the director of a hospital should have done it on our behalf. We then appealed against this decision to the State Council, and again we were rejected. In this case, we were told that our appeal was missing proof that we had prepared a research network and submitted a proposal—remember that the call for proposals excluded our project. Nevertheless, I did submit a proposal, knowing

that it was not going to be considered. It was also argued that the text of the call defines what can be funded, thereby ignoring our counterarguments. So far, I would say that the rejection seems quite absurd.

“Scientists have to defend their independence and the more autonomy and independence a scientist has, the stronger that scientist must safeguard it and science in general”

EMBO reports: What stage are the proceedings at now?

Cattaneo: The court case is still in progress and we are currently waiting for the final decision from TAR Lazio, perhaps in a few months. I feel fortunate to be represented by Vittorio Angiolini, who is an exceptional lawyer. His main point is that excluding human embryonic stem cells from the public call violates the constitutional freedom



© Davide D'Ortona

of scientific research. Let's not forget that the use of established human embryonic stem cell lines in research is legal in Italy. In our view, in order for the government to legitimately exclude a legal and scientifically relevant part of a topic that they themselves define as a 'priority', that same government has to make public its justifications. Instead, the text of the call just said that 'research on human embryonic stem cells is excluded,' full stop.

EMBO reports: Three women are leading this legal battle. Is this a coincidence?

Cattaneo: I hope it is a coincidence.

EMBO reports: Have you been supported by the Italian and international scientific community?

Cattaneo: On the Italian side we have been encouraged by a number of scientists. Unfortunately, the Italian scientific community is very small; thus it is rather uncommon for scientists to take any initiative for fear of being disadvantaged—for example, excluded from public funding. After our legal action took off, some opted for staying silent while others openly expressed their support. Some others, who hold positions as director or dean, explained to us that it was difficult for them to intervene. Elisabetta Cerbai is now Vice Chancellor for Scientific Research at the University of Florence. Before taking on that position, she made clear that she would not give up on the appeal. There has also been substantial support from the international community. Many colleagues in Italy and elsewhere have donated money to support us financially and help us to cover legal costs, which are now close to €14,000. Fortunately, Vittorio Angiolini is also helping us by not charging us for his professional service.

EMBO reports: You have become a prominent voice in the Italian public debate. Can you still combine your public engagement with your research?

Cattaneo: Of course this is eating up a lot of my time and energy. However, I do not see our battle as a waste of time. On the contrary, I think defending the freedom of research is intrinsic to being a scientist and cannot be avoided. Becoming a scientist implies that you are willing to face down any attacks, especially if these are based on authoritarian

arguments and without any empirical evidence. Scientists have to defend their independence and the more autonomy and independence a scientist has, the stronger that scientist must safeguard it and the freedom of science in general. The time I am investing in the appeal is time dedicated to my work; to science. It is as valuable as performing an experiment. Whatever prejudicial interference is aimed at you with which you do not agree—regardless of whether you are alone or have the support of thousands of colleagues—you have to react to it.

In my opinion, this is the crucial moment where many drop out saying: 'I am too young... I am too old... I cannot do this because I know that politician... why should I stir things up?'. But you should stand up in public if you are a scientist, because this is your job. If someone has been criticizing your experiment, if someone abuses your science, what other weapon do you have apart from scientific evidence? If scientists do not defend the ethical and political preconditions for their work, they arbitrarily make a compromise. In this sense, our legal action has not affected my career: it has grown together with the need of my science to be autonomous and based on real facts.

“...Italian scientists are highly competitive at the international level where transparency, meritocracy and peer review are the major criteria”

EMBO reports: How do you fund your studies using human embryonic stem cells?

Cattaneo: The key thing an Italian scientist has to learn from the moment he or she takes the first steps toward independence is to not rely on public funding for intellectual and scientific progress. There are too many cases in which the distribution of funds has not been transparent. Most of the time, these funds are exiguous and arrive with uncertain timing. For instance, the results of the 2009 public call for stem-cell research were announced a few weeks ago, after 14 months! But it could have been 20 months, you never know. Last year, the parliament had to intervene in order to receive the results of a competition for young scientists because the results never came.

Sometimes public calls indicate that only projects with a certain scope and cost—for example, €2 million for 3 years—will

be considered. It is only after you have put together the research network and submitted your proposal that you are notified, if you are lucky enough to be approved, that your grant will be only €300,000 to be distributed between perhaps 4 groups for 3 years. Therefore, Italian researchers had better rely on international funding. It is also an important exercise to make your ideas stronger as they will have to compete internationally.

EMBO reports: The Nobel Prize for Medicine and Physiology this year was given to Robert Edwards, the father of *in vitro* fertilization. The development of this technique was made possible by human embryonic stem-cell research. What is the state of stem-cell research in Italy?

Cattaneo: Yes, this Nobel Prize is a wonderful recognition of the field, albeit indirectly. However, the *via italiana* is anomalous and favours a different approach. Apparently, Italian policy-makers decided to invest in adult stem cells because these cells are ethically impeccable—implying that human embryonic stem cells are 'peccable'. Is adult stem-cell research a priority strategy in Italy? It does not seem so to me. Maybe, as a topic that has received funding from only two calls in ten years, the claim that it is a priority is false. Science in general, as for other disciplines dealing with innovation and knowledge development, is not a priority at all in our country.

To take the example of stem-cell research, the Italian government issued a grant deadline in 2001 to bid for a share of €5 million. The money was managed by a committee of scientists, many of whom have offered their 'ethical' views against human embryonic stem-cell research. Yet their ethics did not prevent them from submitting their own proposals to themselves and having them approved—thus assigning themselves a lot of the money that they were meant to distribute to the scientific community.

It was not until 2006 that a new allocation of €3 million was made for research on stem cells. In 2007, some stem-cell scientists—including those working on the 'ethical' adult stem cells—then made an attempt to divide this small amount by way of phone calls rather than public calls. Three researchers, including myself, realized what was happening and informed the then Health Minister, Livia Turco. After two months of silence, Turco announced the establishment of a 'regular' call and the

injection of another €5 million. In the meantime, new elections and a new government under Silvio Berlusconi came to power.

EMBO reports: What happened to that money?

Cattaneo: That elusive €8 million passed on to the next and current Minister of Health, Ferruccio Fazio, who issued a new call in February 2009. This is the call we appealed against. The first draft of that call covered both adult and embryonic stem cells. Then someone—nobody knows who—surreptitiously added the clause excluding human embryonic stem cells from funding. And now, not only did the results arrive 14 months after the submission deadline; even more interestingly, the names of the recipient scientists are not being released.

“They talk about the ethics of human embryonic stem cells; I would like to see a debate about the ethics of those who manage public funds”

EMBO reports: What would be a cure for this lack of transparency in the management of funding in Italy?

Cattaneo: Paradoxically, Italian scientists are highly competitive at the international level where transparency, meritocracy and peer review are the major criteria. Turning to Italian public funding, somehow those basic rules disappear and my impression is that too many individuals start selling their own scientific independence. Instead of wasting time playing in the political sphere, Italian scientists should stand up again and free themselves from compromises and power games. Money is scarce. The scientific community is small and therefore easily influenced. I understand its behaviour, even though I do not endorse it, because it is constantly suffocated by all these anomalies. As a consequence, young scientists leave. The cure for Italian science? Intellectual honesty would be enough. Italian science is not sick. What is sick is the policy of Italian science, whose management is self-serving. They talk about the ethics of human embryonic stem cells; I would like to see a debate about the ethics of those who manage public funds.

EMBO reports: As the stem-cell field has developed, researchers themselves have

held vigorous discussions about the validity and reproducibility of results. Embryonic stem cells and adult stem cells: why does science need both? What is your view?

Cattaneo: It is meaningless to discriminate between embryonic stem cells and adult ones and claim that one type of research is more promising than the other. At this stage, research must explore all directions.

I used to work on adult stem cells, and then I moved to embryonic mouse cells and then human ones. As soon as you see them down the microscope, you realize the potential of the latter. They produce much higher amounts of high-quality neurons than any other stem cell. They have an exceptional plasticity: if you study amyotrophic lateral sclerosis they produce cells very similar to motor neurons; if you study Huntington disease you can obtain exceptionally beautiful neurons similar to those of the striatum.

I started working with human embryonic stem cells made in the lab of James Thomson in 2001, and then more recent lines from the Karolinska Institute and Sheffield University—produced by Outi Hovatta and Peter Andrews, respectively—in 2007. In terms of their ethical status, I personally think that these are no more than cells *in vitro*. A blastocyst is a structure of 200 cells. I understand that for some people this is a human being. For me it is not: a blastocyst *in vitro* does not have any of the conditions a *persona* has.

EMBO reports: Stem cells, Church and politics: does the Church interfere with science and politics? What would you tell a Catholic about your work?

Cattaneo: When I think about Catholics, as I have experienced them, I do not see this religion as being against science. It is the political dimension of the Church that affects science, and not its religious dimension, with which I share many principles.

Actually, I am in tune with many Catholic people who understand my research. I would like to talk with them about the ethics that pervades my day as a scientist. Indeed, there is a decision to be taken every moment. And every decision is pondered upon deeply to reflect my responsibilities towards money, people and management. I respect the thoughts of everyone and if someone has something to argue I do not have any *a priori* position against their arguments and I am open to discussion. In free societies it

is quite normal to have dilemmas, such as human embryonic stem-cell research. We definitely need an ethical dimension to science. But when some members of the Catholic Church still claim that research on embryonic stem cells is unnecessary, this is a manipulation of scientific evidence.

Those who oppose embryonic stem-cell research in Italy, but also in the USA, are not simply presenting their ethical or religious arguments and asking others to discuss them. Instead, they are denigrating scientific results by emphasizing disagreement and spreading false information about the alleged scientific or therapeutic superiority of the research they wish to support. They create false perceptions of science.

“It is the political dimension of the Church that affects science, and not its religious dimension, with which I share many principles”

EMBO reports: Does anything else not work in Italian science?

Cattaneo: Misinformation has consequences for the political guidelines that sustain research. The management and public funding of science are affected by conflicts of interest. In several cases, politics has gained privileges not based on merits; therefore it looks perfectly normal to some politicians if public funds are distributed to friends of friends. This system poisons science and the freedom of science.

As I mentioned before, negotiations between public administrations and research institutions lead to an assignment of funds without a transparent evaluation system. Committees will finance their own members and financial acts could assign millions of Euros of public money every year to some institutions rather than others, based on the mood of Ministries. This is going to jeopardize the intellectual autonomy of Italian science. For 100 years science has not really been a priority in this country. Politics in Italy are built on immediate profit. The problem is that we are always in the midst of an election campaign, and short-term strategies guarantee public consensus.

EMBO reports: Your position is also described in the book *Staminalia* by the Italian philosopher of science Armando Massarenti, which in turn inspired

Staminalia: A Dream and a Trial, a theatre piece that premiered at the Gulbenkian Foundation in Lisbon last summer. Do you think these forms of science communication—including contributions from European Union funded Research Consortia—are effective? Might this help to make people more aware of the issues?

Cattaneo: Every form of communication able to transmit the joy of science—and its failures of course—is a powerful resource. However, in Italy, professional scientific

journalism is still in its infancy. The Church and the political spheres are willing to manipulate and distract and I am afraid that some journalists fall into the trap, attacking science just for the sake of it. Journalists do not ask me about our latest findings on Huntington disease, but how many animals we have cured.

Science asks you to fall in love with her. Then she asks you to go to the bench and do the experiments and to dismantle your idea. What remains of your original idea is the evidence. And so you move the border of the unknown a little further back. Eventually

science asks you to tackle new questions. This fascinating microcycle is based on evidence and this is what should be divulged, because science teaches us how to improve ourselves, how to become better citizens.

EMBO reports: Dr Cattaneo, thank you for the interview.

This interview was conducted by Marta Paterlini, a journalist in Stockholm, Sweden.

Published online 3 December 2010

EMBO reports advance online publication 3 December 2010; doi:10.1038/embor.2010.194