

A conversation with Elena Cattaneo, Milan

“Scientific Knowledge, a Labour of Love”

Elena Cattaneo, professor at the Department of Pharmacological Sciences, University of Milan and since 2009 coordinator of the EU (FP7) funded project NeuroStemcell talks to *Lab Times* reporter Guiliama Deflorio about doing life science in Italy, the relationship between science and society, and her research on Huntington's Disease.

L *ab Times:* Was there a specific reason for choosing Huntington's Disease (HD)?

Elena Cattaneo: I have always been attracted by the study of neurodegenerative diseases, as I was intrigued to understand how the brain works. I got in touch with some patients suffering from HD about 20 years ago; at that time I was already working on the brain and I became interested in understanding how some neurons might develop. I cannot explain why that is, there is something special that creates a tie with HD patients. Also, meeting with Nancy Wexler at an international congress motivated me to work on HD. She promoted the creation of a scientific community together with her sister Alice and their father. About 40 years ago, while working at the Columbia University, she travelled to Venezuela with a large group of scientists to identify the HD gene – in that country, in villages close to the shores of Maracaibo lake, there was a history (i.e. a long genealogy) of people bearing the HD gene, therefore there were several generations of people, which they used to study the disease.

The gene for HD is very ancient (800 million years old), initially it was found in *Dictyostelium*; it was born 'innocent', i.e. without CAG repeats (which are responsible for the disease). But then, following evolution, CAG repeats appeared two times in sea urchin, four times in zebrafish and seven times in mice. Human beings having less than 36 repeats are okay but those with more than 36 repeats do develop HD.

Can you tell us something more about your scientific activity?

Cattaneo: We are currently focusing on two areas of research: stem cell research and HD. These have recently been coming together; as with stem cell research, we are studying genes and abnormalities involved with HD also using animal models in rats and mice. With these models we, after all, aim to identify targets for the development of new drugs for HD patients.

Back in 2005, our laboratory was the first in Italy to work on human embryonic stem cells. Two years later, during the first conference organised in Italy on stem cell research, I was attacked by students belonging to pro-Vatican parties who wrote letters and put up posters at the entrance of the university in Milan “Auschwitz or public university?”. I was on the front cover of a few Italian newspapers for several weeks... It took me a long time to realise that this discussion does not have to do with religion. It has been a challenging period of time, during which I learned what it means when somebody restricts my freedom to doubt, to inquire, to explore. Also, I learned not to stop supporting what I am doing until someone else shows it is wrong. Since then I keep a blackboard in my office on which I take notes of the pros and cons of my scientific research.

You share a concern for ethical issues involved with stem cell research?

Cattaneo: Yes, probably it is so because I had to come to terms with an inappropriate political influence in scientific affairs. I think there should be no limits in good science; the only limit is one's own imagination.

In 2009, for the second time, I decided to take an active part against the government: two other female scientists (Prof. Elisabetta Cerbai, University of Pavia, and Prof. Sivia Garagna, University of Florence) and I sued the Italian government against the exclusion of stem cell research from an open call for funding. I think the government has no right to exclude areas of research from public calls, especially at the last minute and without giving a reason. Can a government enter so deeply into a topic without having any appropriate knowledge?

On a different level, we are also fighting to improve the Italian peer review system – I discovered many times that people from institutions who were entitled to distribute money for research through public procedures had given money to institutions or individual researchers directly, by means of phone calls instead of public calls. If you would like to be free as a scientist, you have to contribute to go through a reliable peer review system.

What happened with your legal action? Have you received an answer yet?

Cattaneo: We first appealed to TAR Lazio (a regional administrative tribunal of the Lazio region, which is also competent to



take decisions on issues at national level) and we were told we were not entitled to appeal against the government – the Rector or the director of a hospital should have done it. We then appealed against this decision to the State Council and again we received a rejection. Currently, we are waiting for the final sentence. Many colleagues have donated money to support us financially, e.g. to cover lawyers' expenses. Unfortunately, the Italian scientific community is very small and so it is rather uncommon that scientists take any initiative for fear of being disadvantaged (for example, for being excluded from public funds).

What is the level of support you are getting in Italy?

Cattaneo: Only two major newspapers (*Il Sole 24 Ore*, dealing with financial matters, and *La Stampa*) have reported many times about those events. Nonetheless, the coverage of such news and discussion on ethical issues has been rather scarce. One of my colleagues from Cambridge University once told me that if it had happened in the UK, the whole scientific communi-

ty would have been very supportive. Luckily, also thanks to your work as journalist, this case is known abroad, it gives important support to us.

“I was attacked by students belonging to pro-Vatican parties.”


It must be hard to keep working under such difficult circumstances – how do you find working in Italy?

Cattaneo: I love Italy but there is a lot to be improved in this country and I like being active, doing what I can with my job. At the same time, I feel I belong to the world. It is not easy to carry out research in Italy; luckily we manage to survive at the European level, thanks to the EU research framework programme FP7. Recently, I started the coordination of a big project (i.e. NeuroStemCell, four years, 15 partners, €12 million), which has the aim of comparing the performance of all available stem cells. We have also obtained funds from the USA, e.g. from the Foundation for HD, etc. My laboratory is one of the happy islands in my country and, since we are an island, we have to be at our best. However, one cannot just rely on islands...

Until very recently, I only had a very small facility (a laboratory of 38 m²) hosting a group of 16 people; at that time I experienced tension doing research, trying to obtain results in a very small space without disturbing my colleagues. I even had to use earplugs as I was sharing my office with four other people! Then, about two years ago, soon after I received the good news from Brussels (regarding the approval of the NeuroStemCell project), I applied for a larger space to the Rector of the University of Milan to manage the EU project, and I received a laboratory space of about 400 m².

Are there any collaborations between your dept. and any private pharmaceutical company, e.g. to develop new drugs?

Cattaneo: Recently, we found that some anomalies, for example low BDNF (BDNF = brain-derived neurotrophic factor), could be further tested to develop new drugs for HD patients. First of all, we are going to repeat our results to verify their consistency. Some pharmaceutical groups have the technology to bind BDNF with safety and efficacy. Since our laboratory found the mechanism under which BDNF is lost, we are working on that mechanism to see if we are able to activate BDNF with the aid of a chemical compound. If these compounds produce benefits, we will further develop them and then obtain a patent. We



My Accuri C6 is always available on my lab bench enabling my research which makes it unbelievably powerful.

Powerful. A high-performance flow cytometer simplified the C6 works with your current protocols and reagents.

Simple. The C6 fits on any lab bench and has no special set-up requirements. With straightforward, intuitive operation, new users produce valuable research data in less than 30 minutes.

Affordable. The C6 fits virtually every laboratory's budget. It costs about the same as a fluorescent plate reader.

Automated. The optional CSampler® eliminates tedious pipetting from multiwell plates to tubes by automatically processing samples in 96-well plates.

Flow cytometry within reach.[®]
www.AccuriCytometers.com

accuri[®]
CYTOMETERS

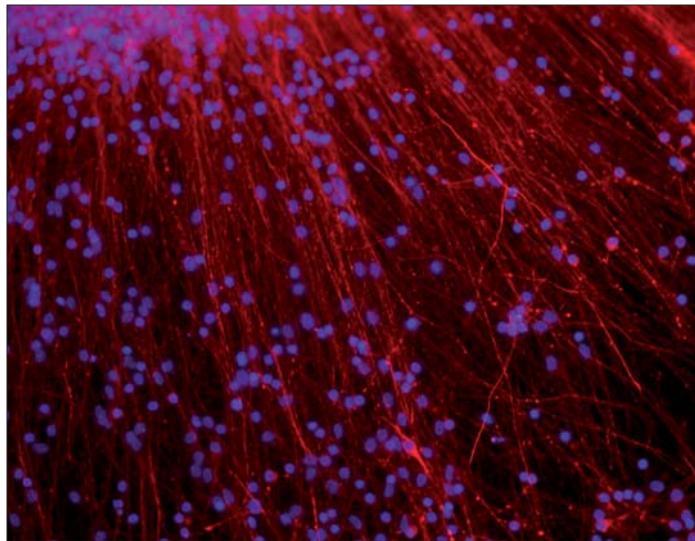
Worldwide HQ: Ann Arbor, MI USA | European HQ: St. Ives, Cambs UK

got in touch with some pharmaceutical companies that showed interest on working with rare diseases such as HD; they will probably use the disease as model.

You seem to find science communication of pivotal importance: I heard of your engagement with outreach activities – for instance, the theatre play “Staminalia” and the photo exhibition “Smile of a stem cell” are touring through Europe, and you find the time to write popular articles in the Italian press, as well as to participate in public talks.

Cattaneo: I think scientists must take outreach activities seriously. Outreach is part of what scientists should do and journalists are there to act as a ‘driving belt’. Even though it might take much time away, outreach helps me to understand the importance of what I am doing. I am trying to promote this type of activity because I believe that the medical profession is devoted to helping others. However, I admit I have to find ways to get organised and make my life become productive. I find it rewarding to create opportunities and possibilities for others, it makes me feel good.

During public talks, I prefer to tell the methods we applied in our research group to obtain those results more than just presenting the results themselves. I do it with my heart because it is a way to show the ‘human side’ of doing research. This allows me to live fully, at 360°.



Pioggia di Neuroni - Rain of neurons. Study objects of Elena Cattaneo.

“If society has a concern, as a scientist I have to consider it.”

Your vision of the way things are sounds very optimistic.

Cattaneo: What strikes me most is what I will do tomorrow. I wish I could help others realise how much one single person can do... Besides the intention, to achieve things I need to create relationships with others, bonds. I believe there is space for better development in this society. Many scientists may experience a sense of isolation, as I did, while they work: I did pure bench work for several years without questioning myself about the role of society in what I was doing. After that period, I started recognising the role of society, a body of people who is not just invading

your space but the other way round. I realised, I had to recruit society into what I was doing. The more I learn about science, the more I recognise the role of society as a big supporter. If society has a concern, as a scientist I have to consider it. If I don't, I lose society.

You lead a large team of people – how do you make it work?

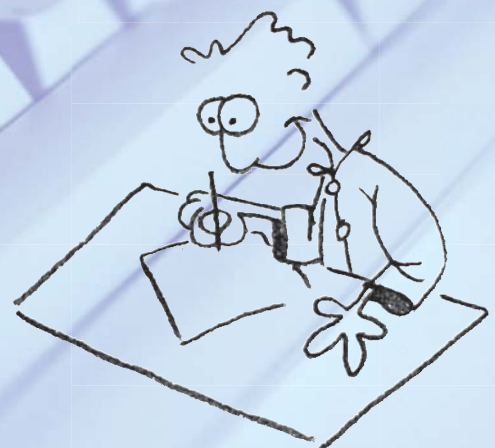
Cattaneo: I coordinate a research group of about 20 people – a lot of brains are better than just one! Some of them are senior scientists and they have been working with me for ten years, they help giving birth to new ideas, co-supervise students, etc. Others are junior scientists; they usually work closely with a senior in their first year and then start working independently. The research group I lead is tightened together by following one goal, i.e. to give hope to those bearing HD. It is animated by a strong cooperation.

**So you work in Life Science Research
and want to try Freelance Writing?**

Or drop by for an Internship?

**Contact
editors@lab-times.org**

Lab Times





I grant a sort of 'organised freedom' to my fellows: after their second year of work in the laboratory. Regardless of them having a PhD or not, they must develop something on their own, something that makes each of them and their work be recognised, so to understand, which tools they need to reach that goal. They should not wait for somebody to tell them what to do, instead they have to draw a territory, an area of enquiry that will belong to them for years, in which they engage themselves, take their own risks, in the name of knowledge and innovation. At the same time, they need to coordinate their own effort with others in the lab and discuss every single aspect. I try to be careful identifying areas of interaction among my fellows; these should not be completely static but, nevertheless, static enough to have a beginning and an end.

In your opinion, what makes a good scientist?

Cattaneo: By doing science I learned how to communicate, how to work with my hands, how to give voice to my dissent. Nonetheless, social ethical aspects need to be taken seriously because they will help establish a better relationship with society. The real strength of science lies in rigorously testing ideas in the laboratory. We have to accept the results coming, even though when we look at them for the first time, we may experience failure. Still, the day after, we start a new journey in the lab.

"I even had to use earplugs as I was sharing my office with four other people!"

In our daily activities, I believe scientists need to address the ethical dilemmas of trust, transparency and integrity. Science can teach us how to become better citizens: one has to respect evidence... On this account, I would like to cite Dennis Overbye (New York) who once said, "If we are not practising good science, we probably aren't practising good democracy. And vice versa."

INTERVIEW: GIULIANA DEFLORIO

ONE FINE DAY IN THE LAB...

BY LEONID SCHNEIDER



Cubis[®]

1st Lab Balance

with Automatic Q-leveling



Now, for the first time, there is a laboratory balance that features self-actuated leveling. That means less effort for operators, more time to devote to their real work and greater safety all around.

Q-Level permits automatic, motorized leveling at the touch of a button. There's never been an easier way to ensure that a laboratory balance is set up properly.

