

Emiliana Borrelli

Emiliana Borrelli was born and grew up in Naples, Italy. She obtained a PhD in biological science at the University of Naples in the 1980s. After her PhD, she left Italy for postdoctoral training, first in Strasbourg, France, and then at the Salk Institute in the USA. In 1989, she returned to Europe, obtaining a permanent position at the INSERM in France and starting her own research group. She is currently Directeur de Recherche I at the Institut de Génétique et de Biologie Moléculaire et Cellulaire in Strasbourg.

Emiliana's first love is neurobiology. She is currently pursuing this with two research projects. The first is based on the study of the dopaminergic system in health and disease, with a particular focus on signalling by dopamine D2 receptors. The second project is a study of the role of myelinating glial cells in CNS development.

In the interview that follows, Fiona Watt, Editor-in-Chief of JCS, asks Emiliana about her experiences as a woman in science.

FMW: *What changes for women in science have you observed during the course of your career?*

EB: With the exception of my studies in Italy and my three years as a postdoc in the USA, my career has been spent in France. The most impressive change that I have observed during these years is probably the increased self-confidence of women scientists.

I belong to a generation that fought for women's rights and I have always been very sensitive to discrimination against women. In my mind it was normal to build a career. I never thought that women had different opportunities from men or that some careers were more suitable for men than for women; that would be basically unfair. Later on, I realized that my views were not shared by all my peers. Indeed, most of my female colleagues from university chose safer and more conventional jobs than me and most of them became high-school teachers, with limited obligations in terms of time and commitment. This was because the social and educational environment at that time left them lacking in self-confidence.



Emiliana (middle) outside the Salk Institute in San Diego, with her friends Mary Hsi and Kevin Murakami (left) and Catherine Thompson and Gail Cerelli (right).

Fortunately, with time, the situation has changed. A larger proportion of female students now undertake science courses. I think that their self-confidence has increased because the role of women in the society has changed and we have culturally evolved. We have gone some way to achieving equal opportunities for both sexes, but there is still a long way to go. I have the feeling that society as a whole must embrace equal opportunities more profoundly, in order for this to impact on women scientists.

Unfortunately, there are still too many occasions in which the ratio of male to female scientists is too high, such as at meetings or in committees. However, it is up to us women to take the initiative and improve our visibility in the scientific community. Although I do not have children myself, it is obvious to me that it is important to start childcare programs in every research institution. Good childcare provision allows young women to be more relaxed about combining a scientific career with motherhood, instead of delaying having children or postponing their careers until their children are at school. EMBO has launched a great initiative to help young mothers restart their scientific careers

after maternity leave. More initiatives like that should be undertaken.

FMW: *How has your research career impacted on your personal life and vice versa?*

EB: As long as I can remember, science was my favorite class at school, and so I never really considered any other career. My parents were happy because I was a good student; that, for them, was enough. However, they became less thrilled later on, when they realized that my career would take me away from Naples, and even from Italy. Only a few months after I obtained my PhD I left Italy; I only go back to my country for meetings or vacations.

Although my thesis was in neurobiology, I made the fortunate decision to be a postdoc in the labs of Pierre Chambon and Ron Evans, both of whom had a profound affect on my career. The beginning of the 1980s was an extraordinary period for molecular biology and Pierre Chambon was a pioneer of the study of eukaryotic gene expression. I applied to his lab because I was fascinated by the possibility of cloning a specific gene of interest and studying its regulation. Fortunately, he accepted me, and so I experienced the

thrill of jumping from neuroscience to hardcore gene expression. I worked on the transcriptional regulation of the adenoviral immediate early gene *E1A*. I learned so much it was like going through a second PhD. During this time Pierre was very supportive, and we had long discussions about how the future of neurobiology would benefit from the application of molecular approaches. In Pierre's lab, I was part of a group of five postdocs (the other four were men) who spent most of the day together, supporting each other and sharing the good and bad times – it was a great period of my life. I didn't have any trouble adapting to France, since the Italian and French cultures are quite close. I learned French easily because of the similarity between the French and Italian languages.

By that time, the transgenesis field was rapidly growing and I became fascinated by the possibility of altering gene expression within a living animal. This was what brought me to the Salk Institute, where Ron Evans had just generated a giant mouse by overexpressing the growth hormone gene. In Ron's laboratory I set up the TKO (thymidine kinase obliteration) system of cell ablation *in vivo* and of course I applied it to growth-hormone-producing cells, generating dwarf mice.

My experience in the US was important because I came to realize that the American approach to the issue of women in science was different from the European approach. Indeed, while in Europe nobody talked about it officially, in the US it was frequently discussed. At the beginning, I was shocked to find the statement 'equal opportunity for women' at the end of all advertisements for positions or jobs where women appeared

as a minority. I never considered myself that way, probably because I had not experienced discrimination myself. Nonetheless women were a minority then, and still are in most scientific disciplines. Thus, I realised that 'equal opportunity employer' was a useful official statement to assess, impose and improve the right of women to be treated like men. As in my experience as a postdoc in Europe, I obtained a lot of support from Ron. I guess I have been fortunate to work with two intelligent and open-minded men.

Thus, overall the impact that my research career has had on my personal life is very positive, as it has provided me with plenty of satisfaction. Nonetheless, since my career has developed away from my country of birth, it has involved separation from my family and friends. I only see them sporadically. Luckily, my husband is also a scientist and together we have made our choices along the way with enthusiasm.

My husband and I are the same age and have had parallel careers, which have enabled us to move together (he is also Italian) from one country to another and to find positions that suited our expectations. It has been important to us, from the very beginning, to keep our own scientific independence. Indeed, we work in different fields and we have never worked together, although we do collaborate sometimes. We have never experienced professional jealousy. I don't think it is possible to be jealous of the success of someone you love, whether this is your wife, husband or friend.

I like to be a scientist because it makes me feel so alive, and keeps me away from routine. Although many people complain about how tough it is, I don't know many who would quit science for a different

occupation. Sometimes I think that research is addictive – we all know the thrill of finally obtaining the results that we had been anticipating for so long!

FMW: *Do you feel that being a woman is an inherent advantage/disadvantage for a career in science? Why?*

EB: I don't think that being a woman is a disadvantage – but for sure it is not an advantage either. I have experienced several occasions when I know that the situation would have turned out differently if I had been a man. I have been obliged to change my way of interacting with people, to become less shy and maybe more aggressive in order to stand up for my opinions.

FMW: *What are your remaining career ambitions?*

EB: I do not have career ambitions in terms of power. Indeed, I don't think I would like to become a head of an institute or of a department... Is ambition in terms of power a male characteristic? I do think so. My only personal ambition is to have pleasure in doing science, to keep it fun and at the same time exciting. I want to retain my motivation for as many years as possible, so that I continue to set up well-thought out experiments, and to be excited about the results. Scientifically, my ambition is that my research will provide insights into the molecular mechanisms leading to human diseases and will help to find novel approaches and therapies.

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