Marisa Roberto

Marisa Roberto is a graduate in Biological Sciences at the University of Pisa and received her doctorate in Neuroscience at the University of Pisa. Roberto has been Faculty at The Scripps Research Institute, La Jolla California since 2005, where she currently is Associate Professor in the Committee on the Neurobiology of Addictive Disorders. Among many other acknowledgments, Roberto received the Young Investigator Award from the Research Society on Alcoholism in 2005.

Last year, she received the Presidential Early Career Award for Scientists and Engineers (PECASE), given by the National Science and Technology Council. The PECASE award is the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers. The PECASE award is intended to recognize scientists and engineers who show exceptional potential for leadership and service at the frontiers of scientific knowledge. The awards are conferred by annually at the White House by the President following recommendations from participating agencies. This award also provided a 5-year extension of one of Roberto’s R01 grants.

Dr. Roberto, what made you decide to leave Italy and why did you decide to stay in North America?
I first came to the USA in 1999 to work on my PhD at the Scripps Research Institute in San Diego, California. I stayed only for nine months but I found the experience very positive, both scientifically and personally. Then, after I completed my Doctorate in Pisa, I decided to return to The Scripps Research Institute, where several opportunities were open to me. In addition, I liked very much the structure of American professional research.

How would you define the interaction with the Italian professional community in North America? And with your colleagues in Italy?
Italian Scientists in San Diego tend to spend a lot of time together and we gather frequently for dinners, and social events. Unfortunately, I don't have a lot of professional interaction with Italian Scientists here in the USA. I do collaborate with colleagues in Italy, but not with those in my University of Pisa. As San Diego is home to a strong scientific community of Universities and private companies, there is a steady flow of young post docs and students coming here to complete their PhD's. I do my best to bring Italian post docs to our prestigious institution to give them an opportunity to do great work.

How does one find a balance between working abroad and contributing to your home country?
During the first few years in the USA, I focused on doing my research and in leading my team as a Principal Investigator. Only in the last five years I have been able to expand my projects, and dedicate more time to my wish to contribute to research in Italy, my country. With this new focus, I established working relationships with Italian Scientists for specific collaborations and I organized two editions of the “Volterra Conference - Stress and Alcoholism” held in May 2008 and May 2011, in my home town of Volterra.

What advise would you give to a young investigator making his/her first steps here?
I learned by personal experience what a great opportunity it is to work abroad, even if just for a limited period of time. My advice to a young investigator is to not let a good opportunity pass you by, work hard and take advantage of the American system of merit, where you can really be rewarded for your personal achievements. While it is important to work in prestigious labs, it is also critical to be enthusiastic, to give your best, to be creative and proactive in proposing new projects that could lead to great science. Remember, in the end you will be judged by the results you obtain and by how these results lead to future advances in science.

Tell us something about your current research
Alcohol abuse causes 4% of the global disease burden, and accounts for extensive unmet medical needs. My aim is to understand which specific neuronal mechanisms underlie synaptic and/or molecular changes that influence the development of alcohol dependence. With prolonged alcohol abuse, adaptations occur at the cellular level as the brain attempts to overcome the acute effects of alcohol intake, often these adaptations lead to near-permanent adverse changes in the structure and function of neurons. The synapse is the primary point for information transfer between neurons, and a central hypothesis of alcohol research is that synapses are the most sensitive sites of ethanol action. Thus, our research focuses on the synapses of the central nucleus of the amygdala (CeA), a brain region considered to be crucial in mediating the behavioral effects of acute and chronic drug consumption.

Roberto's early studies significantly advanced the field of alcohol research by elucidating critical synaptic and molecular mechanisms regarding the unique sensitivity of the GABA and glutamatergic systems in CeA to acute and chronic ethanol. Roberto first identified a clear presynaptic effect of acute ethanol in enhancing vesicular GABA release and decreasing glutamatergic transmission in CeA neurons, and that these neuroadaptations play a role in the development of alcohol dependence. In particular, her findings provided a cellular mechanism for previous behavioral data suggesting that GABA in the CeA plays a major role in the transition to ethanol dependence. A fundamental dichotomy exists between systems that mediate positively reinforced alcohol consumption (“reward drinking”) versus negatively reinforced intake (“relief drinking”). Classical activation of brain reward systems by alcohol is likely confined to early stages of the dependence.
process and to individuals with a genetic susceptibility. Over time, chronic elevated alcohol exposure results in neuroadaptations that involve the recruitment and pathological activity of extrahypothalamic stress systems, providing an incentive for negatively reinforced alcohol intake. The neuropeptide corticotrophin-releasing factor (CRF) in the CeA has been hypothesized to have an important role in brain emotional function. Thus, Roberto has characterized synaptic action of CRF at CeA synapses and the involvement of this system and other stress-related neurotransmitters/neuroregulators such as nociceptin and neuropeptide Y in alcohol dependence. Her findings provide a framework for further molecular and cellular research that will facilitate medication development and may help tailor personalized therapies for alcoholism.