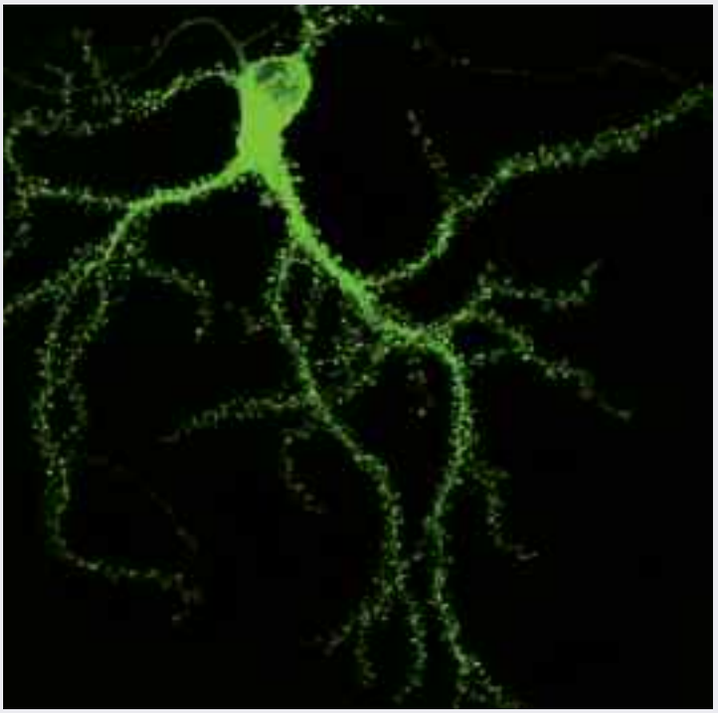

Laura Teodori
BIOTEC-MED, ENEA Casaccia, Roma
Co-Chair Membership Service Committee
International Society to the Advancement of Cytometry.
Luigi Campanella
Dipartimento di Chimica, Università di Roma "La Sapienza"
President of the Italian Chemical Society
Zofia Maciorowski
Flow Cytometry Facility, Institut Curie, Paris (F)
Chair Education Committee
International Society to the Advancement of Cytometry

2008 NOBEL LAUREATE FOR CHEMISTRY ROGER TSIEN COMES TO ROME

To celebrate its 100th birthday, the Italian Chemical Society invited 2008 Noble Laureate for Chemistry Roger Tsien to Rome for a lecture on the discovery of GFP and his paramount contribution to the development of fluorescent proteins.

The discovery and development of green fluorescent protein (GFP), for which the 2008 Nobel Prize in Chemistry was awarded to Roger Tsien, is a shining example of how fundamental scientific research leads to important applications in diverse fields, notably to applied and industrial research. In the case of GFP, the study of marine organism bioluminescence unexpectedly provided researchers with an incredible set of tools for the visualization of live cell biology. In the field of cytometry, no single discovery has had a more dramatic and lasting impact as have fluorescent proteins. Every model (bacteria, insect, plants and animals) and every area of interest (cancer research, neuroscience, immunology and developmental biology) has been touched and transformed by the ability to visualize biological processes in real time.

The story of the discovery of GFP begins with Osamu Shimomura's research into the phenomenon of bioluminescence. In the early 1960s he isolated a blue bioluminescent protein from a jellyfish. The jellyfish, however, glowed green. Further study revealed that the light from the blue protein was absorbed by another protein present in

<riempire 1>The Mayor of Rome, Gianni Alemanno, confers the She-wolf, symbol of Rome, to Roger Tsien

the jellyfish, GFP, which then emitted green light. This occurred spontaneously with no accompanying factors. It was not until the early 1990s that the gene encoding this protein was characterized by Douglas Prasher. Due to Dr. Prasher's generosity, Martin Chalfie and Rodger Y. Tsien both obtained the gene for GFP which lead to their seminal work and to the Nobel Prize.

The Mayor of Rome Gianni Alemanno's speech in honor of Roger Tsien

In 1988, Martin Chalfie used molecular biology techniques to introduce the GFP gene into *C. elegans* DNA. GFP was produced by the cells of these small worms, giving off its green glow independently and with no indication of damage to the worm. Subsequent work showed that it was possible to fuse the GFP gene to genes for other proteins, opening up a world of possibilities for the tracking and localization of specific proteins in living organisms.

While Shimomura, Prasher and Chalfie were all instrumental in taking GFP from the jellyfish and demonstrating its value as a tracer molecule, it was Roger Tsien who was responsible for our understanding of how GFP works. He developed GFP mutants which fluoresce more rapidly and brightly than wild type GFP. Roger Tsien studied how the GFP structure produced green fluorescence and used this knowledge to tweak the production of molecules to emit light at other wavelengths, producing a rainbow of tags of different colors. He and his group added fluorescent molecules from other natural sources to the tag collection. They continue today to expand the range of fluorescent proteins available. Complex biological networks can now be labeled with an array of colors, allowing visualization of a multitude of processes previously hidden from view.

These amazing discoveries impact on many fundamental aspects of our life: in medicine, the care, prevention and treatment of terrible pathologies such as Alzheimer's and Parkinson's disease as well as cancer; in chemistry, the ability to design, setup and apply sensors to monitor and correct health and environmental conditions and in biology, the ability to examine many different models of cell signaling and function.

For the Italian Chemical Society this research is vital: our Society has been and continues to be engaged in the contribution of Chemistry to quality of life.

Roger Tsien was a guest of the Italian Chemical Society who co-organized this event with ENEA and the Comune di Roma. ENEA has been a pioneer in the field of cell-based analytical biochemistry and this symposium was an opportunity to celebrate the 30th anniversary of the Cytometry Laboratories at ENEA-Casaccia, the first in Italy. It was a great pleasure for the audience to listen to such a prestigious and enthusiastic scientist, devoted to science and committed to the education of young scientists. Tsien passed on advice he received when he was young: «My then Department Chairman gave me advice when I was an Assistant Professor, when I was worried about choosing between some safe projects and some risky ones. He said, "Trust your heart and your gut and go for the one that you think is really interesting. Don't worry too much about trying to game the system, and what's going to be the most appealing to outside people. Pick the one that you think is the most interesting"».

Roger Tsien received the honor of a bronze statue of the Lupa, the She-Wolf who suckled Romulus and Remus, the classic symbol of Rome, presented to him by the Mayor of Rome, Gianni Alemanno. A celebration in honor of Dr. Tsien followed.

Two other distinguished guests spoke at the Symposium: J. Paul Robinson, Past-President of the International Society for the Advancement of Cytometry and Director of the Cytometry Laboratories in Discovery Park at Purdue University, Lafayette, Indiana, USA, and Wolfang Goehde, the inventor of the fluorescent-based flow cytometer, from Muenster Universitaet, Germany. Goehde told the audience about history of flow cytometry, the background of how his invention took place and the development of cytometers from the 1960s onward.

The collaboration between the Italian Chemical Society and the International Society for the Advancement of Cytometry began in Rome, thanks to our most famous cytometrist, the Nobel Prize for Chemistry Roger Tsien. We are grateful for this and look forward to many fruitful years ahead.