8 October 2008

The Nobel Prize in Chemistry 2008

The Royal Swedish Academy of Sciences has decided to award the Nobel Prize in Chemistry for 2008 jointly to

OSAMU SHIMOMURA

Marine Biological Laboratory (MBL) Woods Hole, MA, USA and Boston University Medical School MA, USA

MARTIN CHALFIE

Columbia University New York, NY, USA

ROGER Y. TSIEN

University of California, San Diego La Jolla, CA, USA

"for the discovery and development of the green fluorescent protein, GFP"

Glowing proteins – a guiding star for biochemistry

The remarkable brightly glowing *green fluorescent protein*, *GFP*, was first observed in the beautiful jellyfish, *Aequorea victoria* in 1962. Since then, this protein has become one of the most important tools used in contemporary bioscience. With the aid of GFP, researchers have developed ways to watch processes that were previously invisible, such as the development of nerve cells in the brain or how cancer cells spread.

Tens of thousands of different proteins reside in a living organism, controlling important chemical processes in minute detail. If this protein machinery malfunctions, illness and disease often follow. That is why it has been imperative for bioscience to map the role of different proteins in the body.

This year's Nobel Prize in Chemistry rewards the initial discovery of GFP and a series of important developments which have led to its use as a tagging tool in bioscience. By using DNA technology, researchers can now connect GFP to other interesting, but otherwise invisible, proteins. This glowing marker allows them to watch the movements, positions and interactions of the tagged proteins.

Researchers can also follow the fate of various cells with the help of GFP: nerve cell damage during Alzheimer's disease or how insulin-producing beta cells are created in the pancreas of a growing embryo. In one spectacular experiment, researchers succeeded in tagging different nerve cells in the brain of a mouse with a kaleidoscope of colours.

The story behind the discovery of GFP is one with the three Nobel Prize Laureates in the leading roles:

Osamu Shimomura first isolated GFP from the jellyfish *Aequorea victoria*, which drifts with the currents off the west coast of North America. He discovered that this protein glowed bright green under ultraviolet light.

Martin Chalfie demonstrated the value of GFP as a luminous genetic tag for various biological phenomena. In one of his first experiments, he coloured six individual cells in the transparent roundworm *Caenorhabditis elegans* with the aid of GFP.

Roger Y. Tsien contributed to our general understanding of how GFP fluoresces. He also extended the colour palette beyond green allowing researchers to give various proteins and cells different colours. This enables scientists to follow several different biological processes at the same time.

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OSAMU SHIMOMURA, Japanese citizen. Born 1928 in Kyoto, Japan. Ph.D. in organic chemistry 1960 from Nagoya University, Japan. Professor Emeritus at Marine Biological Laboratory (MBL), Woods Hole, MA, USA, and Boston University Medical School, MA, USA.

www.conncoll.edu/ccacad/zimmer/GFP-ww/shimomura.html

MARTIN CHALFIE, US citizen. Born 1947, grew up in Chicago, IL, USA. Ph.D. in neurobiology 1977 from Harvard University. William R. Kenan, Jr. Professor of Biological Sciences at Columbia University, New York, NY, USA, since 1982. www.columbia.edu/cu/biology/faculty-data/martin-chalfie/ faculty.html

ROGER Y. TSIEN, US citizen. Born 1952 in New York, NY, USA. Ph.D. in physiology 1977 from Cambridge University, UK. Professor at University of California, San Diego, La Jolla, CA, USA, since 1989. www.tsienlab.ucsd.edu

The Prize amount: SEK 10 million to be shared equally More information: www.kva.se and http://nobelprize.org Contacts: Erik Huss, Press Officer, phone +46 8 673 95 44, +46 70 673 96 50, erik.huss@kva.se Annika Moberg, Editor, phone +46 8 673 95 22, +46 70 263 74 46, annika.moberg@kva.se

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