

## Obituary

# Obituary on Taketoshi Ono

Hruda Nanda Mallick<sup>1</sup>, Hisao Nishijo<sup>2</sup>

<sup>1</sup>Department of Physiology, AIIMS, New Delhi, India, <sup>2</sup>Department of System Emotional Science, University of Toyama, Toyama, Japan.

### \*Corresponding author:

Hruda Nanda Mallick,  
Formerly Professor,  
Department of Physiology,  
AIIMS, New Delhi, India.

[drhmallick@yahoo.com](mailto:drhmallick@yahoo.com)

Received : 03 March 2023

Accepted : 03 March 2023

Published : 29 March 2023

### DOI

10.25259/IJPP\_124\_2023

### Quick Response Code:



Professor Taketoshi Ono, former President of Toyama Medical and Pharmaceutical University (Toyama, Japan), former President of the Japan Emotion Society and Specially Distinguished Professor at the University of Toyama (Toyama, Japan), passed away on Thursday, 15 December 2022 (at the age of 84). We pray for his soul to rest in peace.



He was born in Kota Bharu, Kelantan, Malaya, in 1938 and came back to Kagoshima, Japan, when he was 5 years old. He spent time with his grandmother in the countryside of Kagoshima from the age of five until he entered Kagoshima University. He learned the basics of ethology through direct contact with the complex and subtle phenomena of animals and plants in nature, as well as the behaviour and habits of captive animals. After graduating from the Medical School of Kagoshima University, he engaged in research on the hypothalamus at Kanazawa University Graduate School of Medicine, where he became an assistant professor and then an associate professor. In 1977, he became a professor in the Department of Physiology, Faculty of Medicine, Toyama Medical and Pharmaceutical University, and in 2004, he was appointed president of Toyama Medical and Pharmaceutical University. He also worked in the USA as an Assistant Professor at the Department of Physiology, School of Medicine, State University of New York at Buffalo, from 1970 to 1972 (Worked with Sir Prof. John C. Eccles and Prof. Werner K. Noell). During his 40 years stay at Kanazawa University and Toyama Medical and Pharmaceutical University, he dedicated himself to scientific research about the brain mechanisms of emotional behaviour and instincts and made significant contributions. His research was focused on the brain mechanisms of emotion and memory of monkeys and rats with positive and negative emotions.

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

©2023 Published by Scientific Scholar on behalf of Indian Journal of Physiology and Pharmacology

He has conducted a wide range of research on the central issues of emotion and memory, including the following important questions: (1) Is the amygdala a centre (main unit) that generates emotions?, (2) Is the hippocampal formation a centre (main unit) of memory?, (3) Is the hypothalamus a centre of emotional expression?, (4) Is the anterior cingulate cortex a centre that transforms positive/negative emotions into positive/negative emotional behaviours?, (5) Is the mediodorsal thalamic nucleus a centre for motor learning related to emotion?, (6) Is the non-primary sensory thalamic nucleus a centre of emotional experience and reward prediction?, (7) Are the septal nuclei an interface between the hippocampus (memory) and the amygdala (emotion) and hypothalamus (emotional expression)?, (8) Is the frontal cortex a centre for the recognition of the context and the environment and for decision-making? and (9) Is the basal ganglia involved in the conversion of positive/negative emotional sensations into behaviours? He has also conducted molecular genetic research on the role of DA receptors in reward prediction.

His main research topic was emotion. The functioning of the mind has three aspects; intelligence, emotion and will. Intelligence and will are directly related to motor and sensory processes, while on the other hand, emotion is closely related to various feelings such as happiness, anger, sadness and joy, which were of great importance to the workings of the mind. Emotion is the process by which these various feelings are formed in the brain and it has been regarded as a fog, not a quantitative measure. Therefore, for the past 40 years or so, emotion has been a difficult subject for studies in brain science. Professor Ono, with his outstanding experience in the study of instinctive and emotional behaviour, originally developed a visual object-auditory sound presentation system in which aversive (hateful or dangerous), rewarding (pleasant or beneficial) or meaningless objects or sounds were presented to monkeys or rats to record and analyse changes in the impulse firing rate (response) of neurons in the brain of awake animals. This system was a breakthrough and contributed to major advances in the field of neuroscience.

His other major area of research was memory. Reference to memories of when (time), where (place), who and what (objects) and how (events) is essential for the expression of emotion. As with studies of emotion, there have been few studies at the neural level of memories of place and events, especially in non-human primates that is, monkeys. Professor Ono originally developed the movable cabin system, in which the monkey itself or the computer controls the location of the cabin in the experimental room, and which also allows the presentation of visual objects or auditory sounds in different directions to analyse the responsiveness of neurons in the brain. With this device, he made a breakthrough in the study of the brain mechanisms of episodic memory and contributed to major advances in the field of brain science.

The mobile cabin system is different from conventional electrical stimulation devices or visual stimulation devices using picture patterns that have been widely used in the field of brain science and the device is very original because it is closely based on the real life of humans and animals.

These studies were designed to elucidate the basic principle of the brain mechanisms of emotion and memory and contributed greatly to the progress of scientific studies of the mind and brain, which is the ultimate goal of neuroscience. The results obtained in the studies at the neuronal level, the limbic system, which plays an essential role in memory and emotion that is, the amygdala, the hippocampal formation and the hypothalamus, using these devices as just mentioned, have been presented in national or international meetings or symposia or plenary lectures and also published in the first class international journals. In addition, it should contribute to the development of treatment/prevention of mental disorders. For these achievements, he received several awards including a memorial medal named after I.M. Setchenov from the First Moscow Medical Institute of USSR in 1984, The Presidium of the Union of the Scientific Workers in Bulgaria from the Union of the Scientific Workers of Bulgaria in 1984, a memorial medal named after academician P.K. Anokhin from the Institute of Normal Physiology of the Academy of Medical Sciences of USSR in 1986, Kamala B.K. Anand Orator and Lecturership Award from the All India Institute of Medical Sciences, New Delhi, India in 1992, the Chunichi Award for the Highest Achievement of Science, Arts and Letters; given by the Chunichi Shinbun in 1994, The Setchenov Medal from the First Moscow Medical Institute of Russia in 1996 and a special award of first memorial award named after Toshihiko Tokizane in 1999.

Professor Ono was a global leader in Emotions and Memory. He published more than 300 papers. His laboratory was epicentre of single neuronal recording in primates and rodents. He organised many international symposia and conferences on Emotions and memory. Under the leadership of Professor Masao Ito, he was a key member Pan-Oceania Neuroscience Commission by IBRO for developing young neuroscientists in Asia. Many international students joined his laboratory equipped with the state-of-the-art facilities for exploring the emotional brain.

The neuroscience community will miss not only an excellent neuroscientist, a dynamic leader and teacher but also a great human being. His extraordinary contribution to the limbic system particularly role of the amygdala in emotion and memory will inspire many students in coming years to explore the emotional brain for its mechanism.

**How to cite this article:** Mallick HN, Nishijo H. Obituary on Taketoshi Ono. *Indian J Physiol Pharmacol* 2023;67:73-4.