Title: The mechanism of acupuncture and its challenge to the basic tenets in neuroscience（針刺的機制及其對神經科學基本信念的挑戰）

Abstract

There are two basic tenets in Western neuroscience. One is the theory of inhibition and the other is the neuron doctrine. These two are in fact intertwined.

The first tenet of inhibition began with the tetanic excitation of vagus nerve by the Weber's brothers in 1845 that caused a standstill of the frog's heart. In the same vein, the volitional elbow flexion was also believed to display reciprocal innervations of antagonistic skeletal muscles by Sherrington. However, in recent years, we have observed only synergic and cooperative co-activations in micturition, storage of urine in Wistar rats, and elbow flexion/forearm pronation in humans. The so-called reciprocal inhibitions were never observed in freely moving non-anaesthetized animals or humans.

As to the second important tenet in neuroscience, effects of acupuncture in our experiments have indicated that a reticular model of meridian systems based on cable theory in communication theory can explain the mechanism of acupuncture while the neuron doctrine is either infeasible or impossible.

Biography

Dr. Shyang Chang received his Ph. D. degree in electrical engineering from the University of California, Los Angeles, in 1984. In 1984 and 1985, he was a Member of the Technical Staff, Bell Communications Research, Red Bank, NJ. Since 1985, he has been with the National Tsing Hua University, where he is currently a professor of electrical engineering department. His research interests are in the areas of biomedical engineering, chaos and fractals, dynamical systems, acupuncture, and traditional Chinese medicine.