Burn injuries rank 3rd among the types of diseases in developing countries (WHO, 2008). More than 300,000 persons suffer from burns injuries in Mainland China (China National Burns Society, 2007). Post-burn hypertrophic scars (HS) often result in disfigurement, limb contracture and deformities. In Hong Kong, occupational therapists (OTs) have been heavily involved in the provision of pressure therapy for patients with post-burn HS and the results have been promising. However, the fabrication of a pressure garment for individual patients is labour intensive: a patient has to be measured manually and then a pattern has to be made manually by therapists before it can be fabricated into a garment. The pressure generated by the garment may not be consistent due to variations in the fabric materials or the measurement methods among therapists.

With the support from the Innovation and Technology Fund, Prof. Cecilia Li and her project team have successfully developed a SMART PRESSURE MONITORED SUIT (SPMS) to cater for the needs of therapists and patients. The SPMS is produced using a software (FUKA) specially designed to convert the 3D dimensions of the human body into 2D patterns. With a specially selected fabric (powered materials), 2D patterns are manufactured into a tailored pressure suit. The powered materials are scientifically proven for their elasticity, durability and comfort. The total time spent in manufacturing a SPMS from a human subject is significantly shortened. The workload of clinicians is thus greatly reduced.

The SPMS was nominated by the university to participate in the 37th International Exhibition of Inventions, New Techniques and Products, which was held in Geneva in May 2009. Over 40 countries and 700 exhibitors participated in this event. The SPMS team won the gold medal in Class M (medicine, surgery, hygiene, orthopaedics and material for the handicapped). On 26 May, 2009, a press briefing and a prize giving ceremony were held to acknowledge the achievement of the award winning participants of the university. The Consul General of Switzerland was invited, as the guest of honour, to present the prize, and he had a high regard for the awardees.
A neuroscience research project conducted jointly by The Hong Kong Polytechnic University (PolyU) and the Chinese Academy of Sciences (CAS) has led to the discovery of a previously unknown feature of the human brain - the novelty detection mechanism in the gateway to the cerebral cortex. The finding was reported in the latest issue (September 2009) of Nature Neuroscience and highlighted by Nature China, both publications of the Nature Publishing Group.

This sophisticated research was undertaken at the University’s Applied Neuroscience Laboratory by a team led by Prof. He Jufang of the PolyU Department of Rehabilitation Sciences and his student, and Prof. He Shigang in the CAS Institute of Biophysics. The study found that the thalamic reticular neurons, which reside in the position of guardian of the gateway to the cerebral cortex, respond to a novel stimulus much more readily than to a repeated stimulus. The researchers repeatedly presented a two-tone melody to rats during the experiment, usually pitching the sound at a standard frequency and occasionally at a deviant frequency. This oddball procedure showed that the auditory sector of the thalamic reticular neurons - which are inhibitory and control the ascending sensory information in the thalamus - has a deviance preference. It is hypothesised that the structure performs an important role in sensory attention.

The Journal of Neuroscience (May 2009). That study found that the auditory thalamic neurons can respond to sounds of low frequency or slow oscillations at frequencies of less than 1 hertz. More importantly, the auditory thalamic neurons can pick up and retain the sound beat for a while even after the sound has stopped. This interesting finding sheds new light on the mechanism of attention and on understanding the sensitivity of our brains to certain sounds.

In this study, the researchers presented repetitive sound stimuli and analysed the response of the auditory neurons with sophisticated measuring tools. The study showed that the sensory neurons remained active after termination of the sound stimuli, and even a weak sound could trigger the sustaining response for at least 10 minutes. The study also found that the thalamic neurons respond to rhythmic sound stimuli during slow wave sleep, as confirmed by extracellular recordings. Such effects may help retain the information of the stimulus interval on an order of seconds.

Principal investigator Prof. He Jufang is one of the leading neuroscientists in hearing research and the thalamocortical system, especially in the corticofugal modulation. With a research interest focusing on systems neuroscience, he combines electrophysiological, anatomical and engineering approaches to investigate fundamental questions involved in hearing, sleep, and learning and memory. Prof. He has recently been named a Craemer Senior Research Fellow for 2009 in recognition of his distinguished research accomplishments.

The Applied Neuroscience Laboratory was set up by PolyU in 2006 to support research work and investigate fundamental questions in neuroscience. A part of this laboratory in the line of visual-auditory integration was designated in 2008 as a Joint-Laboratory between the Chinese Academy of Sciences and PolyU.

The Applied Neuroscience Laboratory was set up by PolyU in 2006 to support research work and investigate fundamental questions in neuroscience. A part of this laboratory in the line of visual-auditory integration was designated in 2008 as a Joint-Laboratory between the Chinese Academy of Sciences and PolyU.

Prof. Michael Feuerstein was the keynote speaker for the Serena Yang Open Lecture, titled ‘Occupational Rehabilitation in Industrialised Asia: Challenges and Opportunities’, which was held on the evening of 15 October. Mr. David Mong represented Dr. Serena Yang in attending the lecture and presented souvenirs to all our guest speakers. Plenary speakers from other Asian countries were also invited to share their experiences in local practices, including Dr. Kay-Fei Chan, medical doctor (Singapore), Ms. Charlie Tan Wah Chiai, occupational therapist (Mainland China) and Dr. Philip Wang To Leong, MD in private practice.

This Serena Yang Lecture Series has provided an excellent learning opportunity for local clinicians and researchers to gain a better understanding of occupational rehabilitation practices and current research in overseas countries such as the USA, Canada and the Netherlands. We have also learned more about the practices in nearby countries such as Singapore and Malaysia as well as Mainland China. We hope that this will contribute to further developments in occupational rehabilitation in Hong Kong. We also look forward to the next Serena Yang Lecture Series in 2010.