First Genome Map of Rare, TCM Herb

After over one year of intense efforts, scientists from Shanghai and Hong Kong announced that they have completed the whole genomic sequencing work of *Isaria cicada*, a rare herb highly valued in traditional Chinese medicine, which will help facilitate its further development in medical and nutrition fields.

It is the first time that the whole genomic sequence of *Isaria cicada* has been released, said the scientists from Shanghai Institute of Bio-Asia Life Science and the Hong Kong University of Science and Technology (HKUST), who participated in the research. The result was announced at the International Biomedical Scientists and Biotechnology Forum 2011 held at the Hong Kong Science Park. According to the result, the genomic size of *Isaria cicada*, a medicine traditionally used to treat children's diseases, is about one eightieth of the human genome, containing about 16,000 genes.

The tests that had been done proved that *Isaria cicada*, with many high-quality genes not recognized or used by human beings yet, has been deeply involved in important life processes like metabolism, providing new ways for further development of *Isaria cicada* in the biomedical field. The genome map will also help accelerate the artificial cultivation of *Isaria cicada*, enhancing its medicine and nutrition value and making it available in a larger market.

Gene Therapy Could Improve Parkinson's Disease

A first-of-its-kind study of gene therapy in the treatment of Parkinson's disease determined that half of all patients who received the treatment had "clinically meaningful improvements" of their symptoms within six months of surgery.

"The study demonstrates that the promise of gene therapy for neurodegenerative disorders has become a reality," says study lead author and co-principal investigator Peter LeWitt, M.D., director of movement disorders at Henry Ford Health System.

The new study is a fast-track publication in the current issue of The Lancet Neurology. That "promise," if verified by currently ongoing follow-up studies and approved by the U.S. Food and Drug Administration, could vastly improve the lives of many of the one million Americans who now suffer the debilitating effects of Parkinson's disease.

Parkinson's disease, which usually affects people over age 50, is a progressive disorder that gradually deteriorates nerve cells in the brain. As the disorder worsens, its effects are visible in the abnormal body movements of its sufferers. These include tremors and stiffness in the arms, legs and neck; slowness of movement and coordination; and trouble with walking and balance. Dementia can develop in the late stages of the disease.

The Michigan Parkinson Foundation estimates that as many as 60,000 new cases are diagnosed each year in the U.S. The new study, which used double-blind sham surgery controls, tested the effectiveness of a gene therapy known as NLX-P101 in 45 subjects with moderate to advanced Parkinson's disease. The patients, ages 30 to 70, were chosen because their symptoms didn’t respond well to other treatments. Among the study group, each patient was randomly
rewired occipital regions of the blind has his insighted individuals is maintained in the organization of the visual cortex observed nonvisual processing, whether the functional who were born blind to be involved in space perception. “Although several studies have shown occipital regions of people who were born blind to be involved in sound processing, this ability to process sounds as part of their experience. “The brain designates a specific brain network dedicated to this ability.”

The gene therapy approach in the current study acts on an alternative neurotransmitter system of the brain involving a signaling chemical called GABA. Another treatment involves permanently implanting a medical nerve-control device in the brain called deep brain stimulation. The gene therapy study with NLX-P101 “met its primary outcome measurement and demonstrated that NLX-P101 gene therapy was safe and well-tolerated over the six-month blinded study period.” In contrast to the concept of implanting stem cells for treating Parkinson’s disease (which has never been tried), gene therapy has been widely used in laboratory research and already is undergoing human testing for other disorders. The procedure does not require general anesthesia (which has potential complications), or implantation of a medical device. “Subjects in our study who received the NLX-P101 treatment displayed better motor performance and control of Parkinsonism than subjects who received sham surgery,” Dr. LeWitt said. “This benefit occurred early and was long-lasting.”

Some Blind People ‘See’ With Ears

Dr. Olivier Collignon of the University of Montreal’s Saint-Justine Hospital Research Centre compared the brain activity of people who can see and people who were born blind, and discovered that the part of the brain that normally works with our eyes to process vision and space perception can actually rewire itself to process sound information instead. The research was undertaken in collaboration with Dr Franco Lepore of the Centre for Research in Neuropsychology and Cognition and was published recently yesterday in the Proceedings of the National Academy of Sciences.

The research builds on other studies which show that the blind have a heightened ability to process sounds as part of their space perception. “Although several studies have shown occipital regions of people who were born blind to be involved in nonvisual processing, whether the functional organization of the visual cortex observed in sighted individuals is maintained in the rewired occipital regions of the blind has only been recently investigated,” Collignon said. The visual cortex, as its name would suggest, is responsible for processing sight. The right and left hemisphere of the brain have one each. They are located at the back of the brain, which is called the occipital lobe. “Our study reveals that some regions of the right dorsal occipital stream do not require visual experience to develop a specialization for the processing of spatial information and are functionally integrated in the preexisting brain network dedicated to this ability.”

The researchers worked with 11 individuals who were born blind and 11 who were not. Their brain activity was analyzed via MRI scanning while they were subjected to a series of tones. “The results demonstrate the brain’s amazing plasticity,” Collignon said. Plasticity is a scientific term that refers to the brain’s ability to change as a result of an experience. “The brain designates a specific set of areas for spatial processing, even if it is deprived of its natural inputs since birth. The visually deprived brain is sufficiently flexible that it uses “neuronal niche” to develop and perform functions that are sufficiently close to the ones required by the remaining senses. Such a research demonstrates that the brain should be more considered as a function-oriented machine rather than a pure sensory machine”.

The findings raise questions regarding how this rewiring occurs during the development of blind new born babies. “In early life, the brain is sculpting itself on the basis of experience, with some synaptic connections eliminated and others strengthened,” Collignon noted. Synaptic connections enable our neurons, or brain cells, to communicate. “After a peak of development ending approximately at the age of 8 months, approximately 40% of the synapses of the visual cortex are gradually removed to reach a stable synaptic density at approximately the age of 11 years. It is possible that the rewiring occurs as part of the maintenance of our ever changing neural connections, but this theory will require further research,” Collignon said.