



MASARYK UNIVERSITY

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Unique tomographs can help unveil the mystery of the brain

Scientists from the Masaryk University Ceitec research centre have started using two unique tomographs for imaging the functions and structure of the brain and the spinal cord. Devices purchased for 100 million CZK will allow the scientists to examine a number of serious diseases such as Parkinson's disease, Alzheimer's disease, epilepsy or schizophrenia and to study the functioning of a healthy brain in their research into risk behaviour of drivers or perception of music.

"Research which has started developing here is a good example of cooperation of various scientific disciplines. Connection of medical, biological and physical disciplines with disciplines from the other side of the science spectrum such as psychology, kinantropology or musicology can significantly advance the knowledge of functioning of the human mind," said MU Rector Mikuláš Bek.

Two MAGNETOM Prisma devices with magnetic field induction of three Tesla have a unique combination of technical and software properties and their parameters are significantly different from those of devices used in hospitals. "It is a top-class magnetic scanner, which provides new possibilities for imaging both anatomic details and functional processes in the human body," said Vratislav Švorčík from Siemens, which supplied the device.

"New magnetic resonance imaging will give us more accurate and detailed measurement results and we can perform new kinds of measurements, which could not have been performed in the Czech Republic so far," said coordinator of brain and human mind research Ivan Rektor.

The first research studies for which the devices will be used include international studies on Parkinson's and Alzheimer's diseases. For several years, doctors will monitor selected patients and compare manifestations of the disease, results of genetic tests and anatomical and functional images of their brains. "The collected knowledge will help us in the future with early diagnosis of the disease and better forecasts," Rektor added.

Together with experts from the MU Faculty of Sports Studies, they will monitor the extent to which regular exercise influences the symptoms and development of early Alzheimer's disease. "The study will include patients with mild impairment of memory and healthy volunteers as a control group. They will go through a half-year dance- and movement program at the Faculty of Sports Studies and we will monitor the state of their brains and attention and memory functions using imaging methods. We assume that exercise can improve the patients' quality of life and maybe also slow down the progression of the disease," Rektor added.

The new devices are part of a laboratory for multimodal and functional imaging, in which scientists have been able for several months to use, among other things, a special electroencephalogram.

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Masaryk University was founded under a law from 28 January 1919 as the second Czech university. At its founding there were four faculties – law, medicine, natural sciences and arts. Currently there are nine faculties and 37 000 students enrolled in standard studies. More information can be found at <http://www.muni.cz>.

