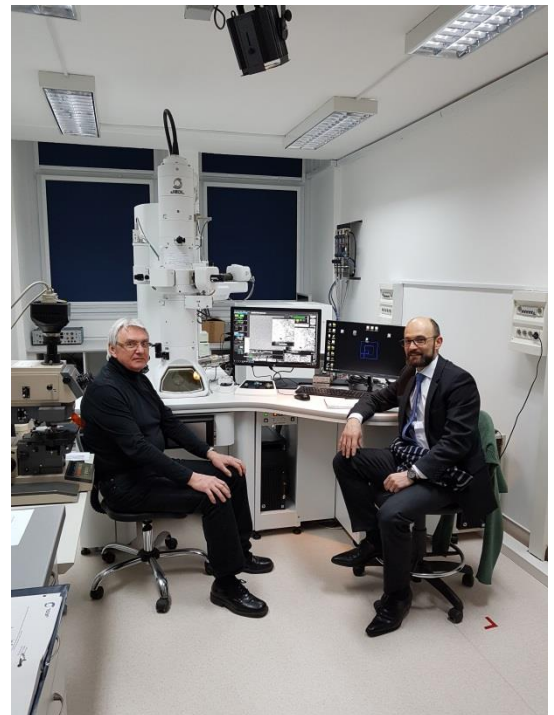


After the successful installation in 2015 of the JEM-1400Plus at the University of Szeged (Institute of II. Pathology), the newly released JEOL JEM-1400Flash Transmission Electron Microscope has been installed in Szeged Biological Research Centre of the Hungarian Academy of Sciences.

This is the first installation in Europe together with Radboud University (The Netherlands). The JEM-1400Flash is fully equipped: Scanning Transmission Electron Microscopy (STEM), Elemental Analysis device (EDS), Electron Tomography (3D), 2 cameras (one 4k CMOS camera) and one Cryo box.

The aims of the microscope are numerous: Qualitative and quantitative characterization of medical/biological samples at high resolution (sub-micron, nano range), micro-analytical determination, as well as 3D characterization of the sample structure. The researcher's priority application is the investigation of degenerative diseases of the motor system, focusing on ALS (Amyotrophic Lateral Sclerosis).



*Pictured left: Dr Siklós László (SZBK)*

The brilliant astrophysicist Steven Hawking and the best baseball player of all time Lou Gehrig are among the famous victims of the disease. In the United States the disease is called Lou Gehrig disease (in remembrance of him).

The consequence of ALS is the morphological modification of the motor nerve endings. Therefore the research will be focused on the development of structural alterations of muscle-nerve and nerve-nerve contacts (synapses) according to the disease evolution. Parallel to these structural alterations, long-term change of the degenerating micro-organelles chemical composition takes place. Among them, the intracellular accumulation of the calcium ions has pathological significance.

Thus, beyond morphological investigations, the distributional analysis of selected elements is also planned by combining X-ray microanalytical measurements with STEM imaging. By programming the TEM thanks to JEM Toolbox Client, stereological methods are planned to be developed in order to derive unbiased 3D numeric parameters of the sample.

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