

New technologies for retinal therapies

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The future of the investigation and treatment of retinal disorders is already here at the MedUni Vienna: in the new Christian Doppler "OPTIMA" (Ophthalmic Image Analysis) laboratory headed by Ursula Schmidt-Erfurth, Director of the University Department of Ophthalmology and Optometry, new technologies in optical coherence tomography (OCT) and computer programmes are being developed, which should help to produce the optimal diagnosis and thus, for the first time, completely individual treatment plans.

The best algorithms have been developed by Viennese researchers based on the results of the "View" study conducted worldwide. 2,450 patients were treated under "View" and the data on their retinas examined in the Vienna Reading Center (VRC) of the MedUni Vienna, which functioned as an international analysis platform.

At present further studies are being conducted worldwide and images taken with an even more sophisticated tomography technology sent to the VRC. The CD team at the VRC is developing analysis programmes to enable [ophthalmologists](#)

in future to interrogate tens of thousands of pieces of data within seconds during retinal examinations. "This way the three most important steps are covered at the same time: the right diagnosis, the correct [prognosis](#) and an adequate check on the treatment. In future we will only treat if it really makes sense and then in a way tailored to fit respective individual needs," says Schmidt-Erfurth. "This is telemedicine of the highest calibre."

At the same time the development of a new optical [coherence tomography](#) (OCT) technology is proceeding apace in the "OPTIMA" Christian Doppler laboratory. This is being opened officially on Tuesday, 18 June 2013, and is the eleventh CD laboratory at the MedUni Vienna. According to expert, the next OCT generation and analysis programmes could be operational clinically within two to three years.

Retinal disorders are treated by injecting [antibodies](#) (anti-[VEGF](#)) into the eye; this is done in accordance with a recommended strict monthly injection cycle impossible to implement in everyday clinical routine. So far it has not been possible to determine the right point in time for treatment to best suit the individual and the individual course of the disorder – this should be achievable with the assistance of the new technologies from Vienna.

Optical coherence tomography – a development by the MedUni Vienna

OCT is an imaging method, the basic physics of which was developed at the MedUni Vienna in the Centre for Medical Physics and Biomedical Technology, and then developed further and optimized in collaboration with the Eye Clinic for applied use in ophthalmology. With the help of [optical coherence](#) tomography it is possible to identify disorders of the retina in high resolution detail – and to do so at a very early stage: "With this we can look directly into the retinal layers non-invasively and discover the slightest changes early." OCT is an imaging process, which – like ultrasound technology, but without any physical

contact whatsoever – can produce high resolution sectional images of biological tissue and which can be regarded as an "optical biopsy". Using this, disorders of the retina such as age-related macular degeneration, diabetes-related disorders or vascular occlusions can be identified before any symptoms appear – and these are then treatable early and in a specifically targeted manner.

Provided by Medical University of Vienna

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