Achievements against ALS

Description of the molecular geometry of amyotrophic lateral sclerosis (ALS) leads to successful therapy for the first time.

Amyotrophic lateral sclerosis is a fatal disease of nerve cells that control voluntary motor functions. The physician Dr Walter Schubert, professor emeritus (HD) at the Otto von Guericke-University Magdeburg and former Visiting Professor at the International Faculty (MPG - CAS PICB) in Shanghai, China, and director of the human toponome project presented a first description of the molecular geometry of sporadic ALS, the so-called ALS toponome (Ref. 1). For this project he applied Imaging Cycler Microscopy (ICM) as an objective hypothesis-free method (Ref 2, Ref. 3). The resulting geometry has been published in „Advances in Pure Mathematics“ (DOI: https://doi.org/10.4236/apm.2018.83017) (ref. 1).

For the first time successfully treated ALS patient
The study (ref. 1) reports that the direct and simultaneous spatial detection of large molecular networks in ALS uncovers cells in the blood circulation that migrate into central pathways of motor neurons in the pyramidal tract and compress the impulse-conducting motor axons (Postmortem-Study). In a patient with an initial stage of the sporadic, non-genetic form of ALS, ICM readily detected this cell type in the blood, – henceforth called axotomy competent cells (ACC). Therapeutic depletion of these ACC in the blood, led to complete regression of the disease, including regression of generalized pathological spontaneous activity in the electromyogram. So far the patient has been without any signs of ALS for two years now, and the patient feels healthy...
Other ALS patients examined with ICM also have these ACC in their blood. The number of ACC per liter of blood correlates with the progression rate of the disease (Ref. 2). This finding is consistent with the pathogenetic role of these cells.

**Human toponome therapy ready for introduction**

At present, great efforts are being made to provide the novel therapy in centers. At the same time, investors are to be won in order to be able to help ALS patients worldwide in this way. Experience with other patients investigated with ICM earlier had already shown the presence of “conspicuous cells” in the blood (citation in ref. 2, and ref. 3). These cells, now known as ALS-specific, so-called axotomy competent cells (ACC), are now spatially decoded with a functional resolution of up to $4.5 \times 10^{481}$. These data and long term observations and follow-up over at least 2 years, as well as presence of these cells in other ALS patients show that detection of ACC and the corresponding depletion therapy are critical new options for ALS patients. In practice: Presence of ACC in the blood of an individual ALS patient (ref. 1) indicates presence of active axotomy of motor neurons in the pyramidal tract! This is an absolute indication for the therapeutic depletion of ACC in view of the experience described above, and in view of absence of any alternative life saving therapy for ALS patients. The therapy is refundable in Germany on application (according to § 137c SGB).

**References:**


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About Dr. Walter Schubert

Walter Schubert is medical doctor and director of the international Human Toponome (HUTO) project in Munich, Germany. He received his doctorate in functional neuroanatomy for studies on the Epiphysis-Testis axis at the University of Bonn. Schubert was Head of the Neuromuscular Laboratory at the Neurological University Clinic Bonn, Germany, and did research at the Center for Molecular Biology of the University of Heidelberg, Germany. Here he succeeded in localizing the Alzheimer’s amyloid precursor protein in a subset of synaptic vesicles in the brain for the first time - a biological information that significantly contributed to the elucidation of the function of this molecule. Walter Schubert is the inventor of Imaging Cycler Microscopy (ICM). ICM achieves a functional and spatial resolution capacity of > 4.5x10^481 combinatorial molecular states (toponomes) per data point. ICM is the core technology for the decoding of spatial laws governing large protein systems in their natural environment in cells and tissues. The ICM technology of the HUTO project is established in laboratories in Germany, England and the USA. Walter Schubert is also Emeritus Professor (HD) of Medical Neurobiology at the University of Magdeburg, Gernany, and Emeritus Guest Professor of Toponomics at the International Faculty of the CAS-MPI partner institute for “Computational Biology” in Shanghai, China, and at the University of Freiburg, Germany. For his work he has received national and international awards and honors, published 160 publications and holds numerous technology and therapy patents. He is member of the Royal Society of Medicine, England. Schubert was head of interdisciplinary international and transnational research projects in Germany and in the EU.