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The human toponome project: Translating the spatial protein network code into efficient therapies

Imaging cyclers® technology (IC®M) is presented as key technology for (i) the spatial resolution of large protein networks at the target sites of disease with a discriminatory power for an unlimited number of proteins at a time (dimension unlimited imaging); (ii) for the *in situ* detection of thousands of distinct multi protein complexes; (iii) for the construction of machines able to decode the mechanism of cell invasion into organs, such as the invasion of autoimmune cells and cancer cells, and (iv) application of this technology for the efficient finding of therapies selectively blocking these invasions. The example of amyotrophic lateral sclerosis (ALS) is presented showing that (i) “ALS cells” were seen by IC® for the first time in the blood, (ii) the mechanism of CNS invasion and pathogenic neuronal axotomy of these cells was completely decoded by IC®, and (iv) these “ALS cells” were efficiently depleted in blood of patients. This ALS example can be translated for other diseases based on cell invasion. The IC® detection of somatotopic coding in the innate immune system is key.

Biography

Walter Schubert is founder and director of the international human toponome Project, and he is the head of the Molecular Pattern Recognition Research (MPRR) group at the Medical Faculty of the Otto-von-Guericke-University, Magdeburg, Germany, and guest Professor for Toponomics at the Max-Planck-CAS (CAS-MPG) partner Institute for computational biology, Shanghai, China. Walter Schubert has studied medicine at the universities of Aachen and Bonn, Germany, and has led the neuromuscular diagnostic center at the university of Bonn. He has invented and developed during his clinical work the toponome imaging robot technology MELC/TIS in 1990 (to decipher the protein networks in humans), is co-initiator of the course of studies in computervisualistics (CV) at Magdeburg university (MDU), and teaches human biology for students in CV and medicine at the MDU. Walter Schubert holds many patents, has received several national and international awards and honours, such as the American ISAC best paper award 2008 (for the three symbol code of organized proteomes, “toponome”), and has launched the human toponome project aiming at the functional decoding of the protein networks in humans.

He is keynote speaker at international congresses (presenting the human toponome project), invited distinguished lecturer at the Case Western Reserve University (2010), and member of several American and European editorial and scientific advisory boards. WS chaired three interdisciplinary national joint projects of the Deutsche Forschungsgemeinschaft and the BMBF (at MDU, and transnational) connecting engineering, informatics, medicine and cell biology in the field of toponomics. The work of his Magdeburg group and coworkers has been acknowledged by a Research Highlight “Mapping togetherness” (Nature 443, p 609, 2006).