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Antibodies (Abs) with functionality (Ab-Proteases) as a new generation of translationaltools designed get healthcare model re-armed

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Abs against myelin basic protein/MBP and cardiac myosin (CM) endowing with proteolytic activity (Ab-proteases with functionality) are of great value to monitor demyelination and/or autoimmune myocarditis (AIM) to illustrate the evolution of multiple sclerosis (MS) and myocardial autoimmunity conditions. Anti-MBP autoAbs from MS patients and patients with AIM exhibited specific proteolytic cleavage of MBP and CM, respectively, which, in turn, markedly differed between: (i) MS and AIM patients and healthy controls, on one hand; (ii) different clinical MS and/or AIM courses; (iii) EDSS scales of demyelination and cardiac autoimmunity scores to correlate with the disability of MS and/or AIM patients to predict the transformation prior to changes of the clinical courses.

Ab-mediated proteolysis of MBP and CM was shown to be sequence-specific whilst demonstrating, for instance, in MBP case five sites of preferential proteolysis to be located within the immunodominant regions of MBP and to fall inside into 5 sequences fixed. Some of the latter (with the highest encephalitogenic properties) were proved to act as a specific inducer of EAE and to be attacked by the MBP-targeted Ab-proteases in MS patients with the most severe (progradient) clinical courses. The other ones whilst being less immunogenic happened to be EAE inducers very rare but were shown to be attacked by Ab-proteases in MS patients with moderate (remission-type) clinical courses.

The activity of MBP- and CM-targeted Ab-proteases was first registered at the subclinical stages 1-2 years prior to the clinical illness of both MS and AIM. About 24% of the direct MS-related relatives and 26% of AIM-related ones were seropositive for low-active Ab-proteases from which 22-28% of the seropositive relatives established were being monitored for 2 years whilst demonstrating a stable growth of the Ab-associated proteolytic activity. Moreover, some of the low-active Ab-proteases in persons at MS- and/or AIM-related risks (at the subclinical stages), and primary clinical and MRT manifestations observed were coincided with the activity to have its mid-level reached. Registration in the evolution of highly immunogenic Ab-proteases would illustrate either risks of transformation of subclinical stages into clinical ones, or risks of exacerbations to develop.

The activity of Ab-proteases in combination with the sequence-specificity would confirm a high subclinical and predictive (translational) value of the tools as applicable for personalized monitoring protocols. Ab-proteases can be programmed and re-programmed to suit the needs of the body metabolism or could be designed for the development of principally new catalysts with no natural counterparts. Further studies on targeted Ab-mediated proteolysis may provide a translational tool for predicting demyelination and myocardial autoimmunity conditions and thus the disability of the MS and/or AIM patients.

Biography

Sergey Suchkov graduated from Astrakhan State Medical University and awarded with MD, then in 1985 maintained his PhD at the I.M. Sechenov Moscow Medical Academy and in 2001, maintained his Doctorship Degree at the Nat Inst of Immunology, Russia. From 1987 through 1989, he was a senior Researcher, Koltzov Inst of Developmental Biology. From 1989 through 1995, he was a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004, a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI. Dr Suchkov has been trained at: NIH; Wills Eye Hospital, PA, USA; Univ of Florida in Gainesville; UCSF, S-F, CA, USA; Johns Hopkins University, Baltimore, MD, USA. He was an Exe Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr Sergey Suchkov is a Scientific Director of The Institute for Global Health and Chair, Dept for Personalized Medicine & Precision Nutrition of the MGUPP, Moscow, Russia. He is a member of the: New York Academy of Sciences, USA; American Chemical Society (ACS), USA; American Heart Association (AHA), USA; EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU; ARVO (American Association for Research in Vision and Ophthalmology); ISER (International Society for Eye Research); PMC (Personalized Medicine Coalition), Washington, USA.

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