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Antibody-proteases as a novel biomarker and a unique target to suit translational tools to be applied for biodesign, bioengineering and precision medicine

Catalytic Abs (catAbs) are multivalent immunoglobulins (Igs) with a capacity to hydrolyze the antigenic (Ag) substrate. In this sense, proteolytic Abs (Ab-proteases) represents Abs to provide proteolytic effects. Abs against myelin basic protein/MBP with proteolytic activity exhibiting sequence-specific cleavage of MBP is of great value to monitor demyelination whilst in MS. The activity of Ab-proteases was first registered at the sub-clinical stages 1-2 years prior to the clinical illness. And the activity of the Ab-proteases revealed significant correlation with scales of demyelination and the disability of the patients as well. So, the activity of Ab-proteases and its dynamics tested would confirm a high sub-clinical and predictive (translational) value of the tools as applicable for personalized monitoring protocols. Of tremendous value are Ab-proteases directly affect-ing remodeling of tissues with multilevel architectonics (for instance, myelin). By changing sequence specificity one may reach reduction of a density of the negative proteolytic effects within the myelin sheath and thus minimizing scales of demyelination. Ab-proteases can be programmed and re-programmed to suit the needs of the body metabolism or could be designed for the development of new catalysts with no natural counterparts. Further studies are needed to secure artificial or edited Ab-proteases as translational tools of the newest generation to diagnose, to monitor, to control and to treat and rehabilitate MS patients at clinical stages and to prevent the disorder at sub-clinical stages in persons-at-risks.

Biography

Sergey Suchkov graduated from Astrakhan State Medical University and awarded with MD, then in 1985 maintained his PhD at the IM Sechenov Moscow Medical Academy and in 2001, maintained his Doctorship Degree at the National Institute of Immunology, Russia. From 1987 through 1989, he was a Senior Researcher at Koltzov Institute 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, he was a Chair of the Deptartment for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). He has been trained at NIH; Wills Eye Hospital, PA, USA; University of Florida in Gainesville; UCSF, SF, 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, he is a Chair, Department for Personalized and Translational Medicine, IM Sechenov first Moscow State Medical University. 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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