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

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Catalytic Abs (catAbs) is multivalent immu-noglobulin (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 pro-teolytic 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. The activity of the Ab-proteases re-vealed significant correlation with scales of demyelination and the disability of the pa-tients as well. So, the activity of Ab-proteases and its dynamics tested would con-firm a high subclinical and predictive (trans-lational) value of the tools as applicable for personalized monitoring protocols. Of tre-mendous value are Ab-proteases directly af-fecting remodeling of tissues with multilevel architectonics, for instance, myelin. By changing sequence specificity, one may reach reduction of a density of the negative proteo-lytic 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 de-velopment 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 subclinical stages in persons-at-risks.

Recent Publications

1. Gabibov A A, Paltsev M A and Suchkov S V (2011) Antibody-associated proteolysis in surveillance of autoimmune demyelination: clinical and preclinical issues. Future Neu-rology 6(3):303–305.

2. D Kostyushev, I Tsarev, D Gnatenko, M Paltsev and S Suchkov (2011) Myelin-associated serological targets as applicable to diagnostic tools to be used at the preclinical and transient stages of multiple sclerosis pro-gression. Open J Immunology 1(3):80–86.

3. Gabibov A G, Ponomarenko N A, Tretyak E B, Paltsev M A and Suchkov S V (2006) Catalytic autoantibodies in clinical autoim-munity and modern medicine. Autoimmunity Reviews 5:324–330.

4. Ponomarenko N A, Durova O M, Vorobiev I I, Belogurov A A, Telegin G B, et al. (2005) Catalytic activity of autoantibodies toward myelin basic protein correlates with the scores on the multiple sclerosis expanded disability status scale. Immunol. Lett. 103(1):45–50.

5. Mysikov V K, Pronina O A, Gnuchev N V, Stepanenko R N, Durova O M, et al. (2002) Humoral immunity in patients with multiple sclerosis. European Journal of Neurology 9(2):2103–136.

Biography

Sergey Suchkov received his MD from Astrakhan State Medical University. In 1985, he re-ceived his PhD from the I M Sechenov Moscow Medical Academy and in 2001, his Doctor-ship Degree at the Nat Institute of Immunology, Russia. From 1987 through 1989, he was a Senior Researcher, Koltzov Institute of Developmental Biology. From 1989 through 1995, he was a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Mos-cow. From 1995 through 2004, he was the Chair of the Department of Clinical Immunology, Moscow Clinical Research Institute. He was an Ex Secretary-in-Chief of the Editorial Board of *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 at the Depart-ment for Personalized and Translational Medicine, I M Sechenov First Moscow State Medical University. He is a Member of the New York Academy of Sciences, USA; American Chemi-cal Society (ACS), USA; American Heart Association (AHA), USA; EPMA (European As-sociation for Predictive, Preventive and Personalized Medicine), Brussels, EU; ARVO (American Association for Research in Vision and Ophthalmology); ISER (International So-ciety for Eye Research) and PMC (Personalized Medicine Coalition), Washington, USA.

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