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Antibody-proteases as a novel biomarker and a unique target for translational applica-tions to be applied for bioengineering and biopharma

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Catalytic Abs (catAbs) is multivalent im-munoglobulin's (Igs) with a capacity to hydrolyze the antigenic (Ag) substrate. In this sense, proteolytic Abs (Abproteases) represents Abs to provide proteolytic ef-fects. Abs against myelin basic pro-tein/MBP with proteolytic activity exhibit-ing sequence-specific cleavage of MBP is of great value to monitor demyelination whilst in MS. The activity of Abproteases was first registered at the subclinical 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 subclinical and predictive (translational) value of the tools as appli-cable for personalized monitoring proto-



cols. Of tremendous value are Ab-proteases directly affecting 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 mini-mizing 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 nat-ural counterparts. Further studies are needed to secure artificial or edited Ab-proteases as translational tools of the new-est 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 per-sons-at-risks to secure the efficacy of re-generative manipulations.

Recent Publications:

- 1. Ponomarenko N A, Durova O M, Vo-robiev I I, Aleksandrova E S, Telegin G B, Chamborant O G, Sidorik L L, Suchkov S V, Alekberova Z S, Gnuchev N V and Gabibov A G (2002) Catalytic antibodies in clinical and experimental pathology: human and mouse models. Journal of Immu-nological Methods. 269 (1-2): 197-211.
- 2. Ponomarenko N A, Durova O M, Vo-robiev I I, Belogurov A A, Telegin G B, Suchkov S V and A G Gabibov (2005) Catalytic activity of autoantibodies to-ward myelin basic protein correlates with the scores on the multiple sclerosis expanded disability status scale. Immu-nol. Lett. 103 (1): 45-50.
- 3. Gabibov A G, Ponomarenko N A, Tretyak E B, Paltsev M A, Suchkov S V (2006) Catalytic autoantibodies in clinical autoimmunity and modern med-icine. Autoimmunity Reviews. 5 (5): 324-330.
- 4. Gabibov A A, Paltsev M A, Suchkov S V (2011) Antibody-associated proteoly-sis in surveillance of autoimmune de-myelination: clinical and preclinical is-sues Future Neurology. 6 (3): 303-305.
- 5. D Kostyushev, I Tsarev, D Gnatenko, M Paltsev, S Suchkov (2011) Myelin-associated serological targets as appli-cable to diagnostic tools to be used at the preclinical and transient stages of multiple sclerosis progression. Open J Immunology. 1 (3): 80-86.

Biography

Sergey Suchkov has graduated from Astrakhan State Medical University and awarded with MD, then in 1985, completed his PhD at the I.M. Sechenov Moscow Medical Academy and in 2001, completed 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 Im-munology, Moscow Clinical Research Institute. He has been trained at: NIH; Wills Eye Hos-pital, PA, USA; Univ. of Florida in Gainesville; UCSF, S-F, CA, USA; Johns Hopkins Uni-versity, Baltimore, MD, USA. He was an Exe Secretary-in-Chief of the Editorial Board, Bi-omedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, he is the Chair, Dept. for Person-alized and Translational Medicine, I.M. 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 Associa-tion for Research in Vision and Ophthalmology); ISER (International Society for Eye Re-search) and PMC (Personalized Medicine Coalition), Washington, USA.

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