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Translational ideology and armamentarium as a strategic tool for advancing MS-related care: Fundamental, applied and affiliated issues

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Abstract

Type-1diabetes (T1D) whilst being a chronic disease, the defining feature of which is the destruction of the insulin-secreting beta-cells and subsequent dependence on exogenous insulin, is possessing with hallmark characteristics of the complex T cell-mediated autoimmunity superimposed on genetic susceptibility. Both genetic and environmental factors combine to precipitate disease, and the outcome of the pathological process is dependent on multiple interrelated factors. The annual global incidence of T1D is increasing by 3-5% per year. The HLA genes are reported to account for approximately 40-50% of the familial aggregation of T1D.Current approaches for the prediction of T1Din screening studies take advantage of genotyping HLA-DR and HLA-DQ loci, which is then combined with family history and screening for autoAbs directed against islet-cell antigens. Inclusion of additional moderate HLA risk haplotypes may help identify the majority of children with T1D before the onset of the disease. Fine mapping and functional studies are gradually revealing the complex mechanisms whereby immune self-tolerance is lost, involving multiple aspects of adaptive immunity. The triggering of these events by dysregulation of the innate immune system has also been implicated by genetic evidence. Finally, genetic prediction of T1D risk is showing promise of use for preventive strategies. Understanding of the genetics, environmental factors, and natural history of T1D has led to greater understanding of the etiology and epidemiology of T1D. Anti islet auto-Abs can be detected before and at time of clinical diagnosis of disease. Auto-antibodies (auto Abs) to beta cell antigens (Ags) are used in the diagnosis of T1D, and studies have shown that they can be used to predict risk of developing T1D in first degree relatives of pro-bands. Strategies for disease intervention, therefore, will not only require the induction of T-cell tolerance by tipping the balance towards regulation but will also need to contain approaches that result in the scavenging of inflammatory mediators, in order to facilitate repair. FoxP3-expressing CD4(+) regulatory T cells (T_{regs}) are potential candidates to control autoimmunity because they play a central role in maintaining self-tolerance. There is thus a requirement for an increased, collaborative effort between stem cell biologists and immunologists in order to tailor an optimal therapeutic strategy for the treatment of this debilitating disease whilst translating the basic outcome into the daily clinical practice. There is an immediate need to restore both β-cell function and immune tolerance to control disease progression and ultimately cure T1D.

Biography

Sergey Suchkov, a researcher-immunologist, a clinician, graduated from Astrakhan State Medical University, Russia, in 1980. He has been trained at the Institute for Medical Enzymology, The USSR Academy of Medical Sciences, National Center for Immunology (Russia), NIH, Bethesda, USA) and British Society for Immunology to cover 4 British university facilities. Since 2005, he has been working as Faculty Professor of I. M. Sechenov First Moscow State Medical University and of A. I. Evdokimov Moscow State Medical & Dental University. From 2007, he is the First Vice-President and Dean of the School of PPPM Politics and Management of the University of World Politics and Law. From 1991-1995, he was the Scientific Secretary-in-Chief of the Editorial Board of the International Journal *"Biomedical Science*" (Russian Academy of Sciences and Royal Society of Chemistry, UK) and The International Publishing Bureau at the Presidium of the Russian Academy of Sciences. From 1995-2005, he served as the Director of the Russian-American Program in Immunology of the Eye Diseases. He is a member of EPMA (European Association of Predictive, Preventive and Personalized Medicine, Brussels-Bonn), a member of the NY Academy of Sciences, a member of the Editorial Boards for Open Journal of Immunology and others. He is the author of the "*Concept of post-infectious clinical and immunological syndrome",* co-author of a *"Concept of abzymes and their impact into the pathogenesis of auto immunity conditions*", and as one of the pioneers in promoting the concept of PPPM into a practical branch of health services.