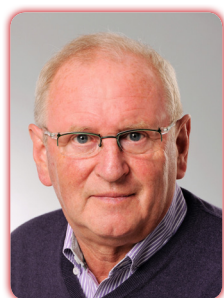


3rd Global Summit on

HEART DISEASES

November 02-03, 2017 Bangkok, Thailand



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The aptamer BC 007 for *in vivo* neutralization of pathogenic autoantibodies directed against G-Protein coupled receptors present in patients with cardiomyopathy: Steps to a new treatment option

With the finding of auto-antibodies directed against G-Protein Coupled Receptors (GPCR-AABs) in diseased subjects, mainly those suffering from diseases of the cardiovascular system, a new class of auto-immune diseases (agonistic autoantibody disease) has been introduced. While auto-antibodies in the classic autoimmune diseases play a role in the destruction of their targets and target tissues, GPCR-AABs are so-called “functional autoantibodies” that agonistically activate their related receptors in a similar way to the physiologic agonists, but without controlling by mechanisms such as, for example, receptor down regulation. Cardiomyopathies such as idiopathic Dilated Cardiomyopathy (DCM), Chagas’ cardiomyopathy and peripartum cardiomyopathy present with auto-antibodies against G-Protein Coupled Receptors (GPCR-AABs) mainly such directed against the beta1-adrenergic and muscarinic-2 receptors which are clearly evidenced as driving the pathogenesis. Aims or objectives for the treatment of agonistic autoantibody disease, in particular DCM the removal of the GPCR-AABs by Immune-Adsorption (IA) have been studied with convincing patient benefit. To overcome cost and logistics problems of IA, the application of a recently patented aptamer (BC 007; single short DNA molecule that bind high-specifically GPCR-AABs) for *in vivo* neutralization of GPCR-AABs could help. Using *in vitro* investigations and animal studies, the aptamer neutralized 1st *in vitro* beta1 and M2-AABs prepared from serum of cardiomyopathy patients and 2nd demonstrated its *in vivo* neutralizing potency after BC 007 treatment of GPCR-AAB positive animals. Furthermore, the same reduction of beta1-AABs was achieved when patients were either immune-adsorbed or patient serum containing the beta1-AABs was *ex vivo* treated with the aptamer. The clinical phase 1 trial of BC 007 is nearly completed.

Recent Publications:

1. Becker N P, Müller J, Göttel P, Wallukat G, Schimke I (2017) Cardiomyopathy - An approach to the autoimmune background. *Autoimmun Rev*; 16: 269-286.
2. Müller J, Wallukat G, Schimke I (2017) Autoantibody directed therapy in cardiovascular diseases. In: Nussinovitch U, editor. The heart in rheumatologic, inflammatory and autoimmune diseases: pathophysiology, clinical aspects and therapeutic approaches. *Elsevier*. ISBN 9780128032671.

Biography

Ingolf Schimke has completed his PhD from Academy of Sciences of the German Democratic Republic and Postdoctoral studies from Humboldt University of Berlin. Until 2014, he was the Professor for Clinical Chemistry and Laboratory Medicine at the Charity-University of Medicine Berlin and is presently the Director of Research & Development at Berlin Cures GmbH. He has published more than 100 papers in reputed journals. He is serving as an Editorial Board Member of reputed journals.

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