Alexander V Maksimenko, Pharmaceut Anal Acta 2014, 5:3
http://dx.doi.org/10.4172/2153-2435.S1.020

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference and Exhibition on
Pharmaceutics & Novel Drug Delivery Systems
March 24-26, 2014 Hilton San Antonio Airport, San Antonio, USA

The conjugation of superoxide dismutase with catalase via chondroitin sulphate for targeting protection of vascular wall

Alexander V Maksimenko
Russian Cardiology Research-and-Production Complex, Russia

Vascular protection is one of the most actual aims of cardiology nowadays. In these conditions, the oxidative stress presents as a serious danger factor of cardiovascular system. Antioxidant enzymes (such as autonomic superoxide dismutase /SOD/ and catalase /CAT/) are potential means for vascular protection. But they demanded the improvement of their biopharmaceutical properties. Accumulation of endothelial glycocalyx glycosaminoglycan-chondroitin sulphate /CHS/ in zones of initial atherosclerotic changes of vascular wall allowed the use of CHS as cross-linking modifier for enzymes. For targeting the antioxidant enzymes towards vascular surface, we applied the covalent conjugating these enzymes /SOD and CAT/ with CHS. The obtained by linkage one another SOD with CAT via CHS /SOD-CHS-CAT/ conjugate had stable and connected (when the product of first enzyme reaction /hydrogen peroxide/ was the substrate for second enzyme transformation) activities and prolonged life-time in blood stream. This SOD-CHS-CAT conjugate possessed vasoprotective activity in respect to platelet interactions, tone of the ring arterial fragment of rat vessel, normalization of hemodynamic rat and rabbit indices changed with hydrogen peroxide administration as oxidative stress model. The SOD-CHS-CAT conjugate had antiplatelet potential due to its anti-aggregation action by means of combined enzyme activities and acquired supramolecular structure. The influence on arterial fragment tone was equal for SOD and CAT in native and connected in conjugate form. Blood pressure and heart rate were significant and effective normalized with SOD-CHS-CAT conjugate in rats and rabbits (after hydrogen peroxide administration as perturbance stimulus). The ECG has no significant alteration. At the first time we have found *in vivo,* the chronic prophylaxis action for antioxidant bienzyme conjugate. It is important for real development of per oral form of SOD-CHS-CAT conjugate. These results indicate the universal approach to development of enzyme glycoconjugates of medical destination.

Biography

Alexander V Maksimenko is an enzyme engineer of medical preparations and began his work in chemistry at Moscow State University, Chemistry Department where he received a Master of Science degree in 1975 and then Ph.D. in chemistry in 1978. He completed a Doctor of Science in biochemistry and cardiology in 1989 at USSR Cardiology Research Center. He has a long history of work at the Cardiology Center, Moscow beginning in 1978 to present. He is currently the Director of biochemical engineering laboratory, Professor in the Institute of Experimental Cardiology at Russian Cardiology Research-and-Production Complex, Moscow, Russia. Now he has published more than 200 papers and is the holder of over ten Russian and foreign patents. Recognized for his work, he is the recipient of medals of exhibition for national economy achievements, the prize winner for research scholarship, laureate of different national and international prizes and decrees of merit. He received membership in the International Commission on Pharmaceutical Enzymes (F.I.P.) in Ghent, Belgium and other International Scientific Societies. His research interests are focused on therapeutic enzymes, polymeric drugs, dosage regimen, courses of enzyme therapy, drug targeting and therapeutic compositions.

alexmak@cardio.ru