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Conjugated glycoenzymes for targeted and prophylaxy action against vascular injuries

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Vascular protection is one of most actual aims of cardiology nowadays. In these conditions the oxidative stress presents as serious danger factor of cardiovascular system. Antioxidant enzymes are potential means for vascular protection. But they demanded the improvement of their biopharmaceutical properties. For this goal the bienzyme conjugate was obtained by covalent connection one another superoxide dismutase with catalase via endothelial glycocalyx glycosaminoglycans – chondroitin sulfate (SOD-CHS-CAT). This SOD-CHS-CAT conjugate possessed vasoprotective activity in respect to platelet interactions, tonus 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 antiaggregation action by means of combined enzyme activities and acquired supramolecular structure. The influence on arterial fragment tonus 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 not 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, enzyme engineer of medical preparations, 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. He has published more than 200 papers and is the holder of over ten Russian and foreign patents. His research interests are focused on therapeutic enzymes, polymeric drugs, dosage regimen, courses of enzyme therapy, drug targeting and therapeutic compositions.

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