Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

A novel inhibitor for advanced glycation and protein cross-linking

Product

Small molecule

Indication

Diabetes Mellitus, Presbyopia

Value Propositions

- Oral, ophthalmic, or parenteral administration
- Potential use in various AGE diseases

Market

- $1.6 billion—Global AGE market (5.4% CAGR 2021-2031)

Intellectual Property

- PCT pending*
- Available for licensing

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Background on CU4371H

He Glycation is the non-enzymatic reaction between reducing sugars, such as glucose, and proteins, lipids or nucleic acids. The formation of advanced glycation end products (AGEs) has been implicated in many age-related chronic diseases including diabetes mellitus, cardiovascular diseases, Alzheimer's disease, cancer, peripheral neuropathy, presbyopia and other sensory losses such as deafness and blindness. Environmental factors, such as diet and smoking influence the rate of AGE formation as well. Additionally, the levels of circulating AGEs are at least partially controlled by genetic factors.

AGEs are commonly involved in the long-term complications of diabetes. Glycated substances are eliminated from the body slowly, since the renal clearance factor is only about 30%. This fact is used to provide a method of testing for sugar levels in diabetics. The long-term complications of diabetes include pathologies in the eye (cataractogenesis and retinopathy), kidney (nephropathy), neurons (neuropathy), and blood vessels (angiopathy and atherosclerosis). Thus, compositions that can counteract the long-term effects of AGE formation and prevent or treat AGE-related pathologies are needed.

Technical Innovation

Dr. Ram Nagaraj and a team of researchers have developed a novel molecule, Carboxitin (glutathione diethyl ester thioethylguanidine disulfide) that significantly reduces crosslinking and Advanced Glycation Endproducts (AGEs) formation in eye tissues to reduce lens stiffness. Delivery of carboxitin into the lens increases glutathione levels and traps dicarbonyl compounds, inhibiting AGE formation. This compound may have the potential to treat diabetic eye complications, cataracts, presbyopia, and age-related macular degeneration.

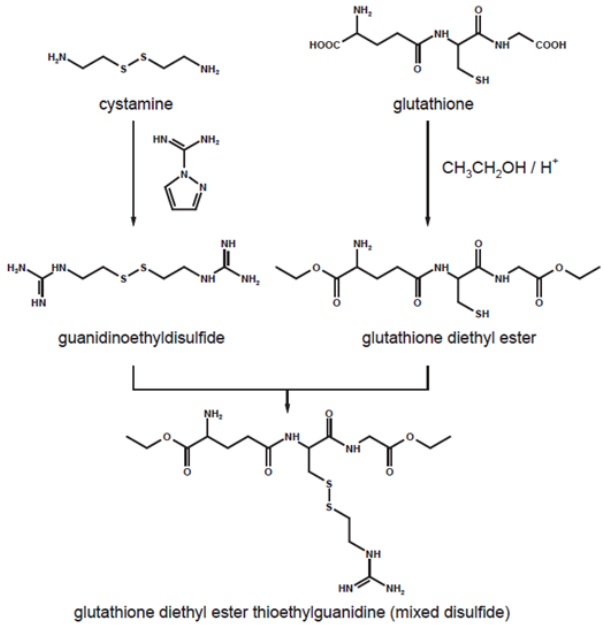

Figure: Synthesis strategy of Carboxitin (glutathione diethyl ester thioethylguanidine)

* PCT pending: PCT/US2018/046442—" INHIBITION OF OXIDATIVE STRESS, GLYCATION, AND PROTEIN CROSSLINKING"—Filed August 13th, 2018.