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(57) Abstract :
The present invention introduces novel chelating complexes derived from ethylenediamine derivatives, incorporating transition metals such as Copper (Cu(II)) and Zinc (Zn(II)). These complexes, including [Cu(meen)3]2+, [Cu(pren)3]2+, [Zn(meen)2]2+, and [Zn(pren)2]2+, are specifically designed for the treatment of diabetes mellitus. By optimising bioavailability and metabolic stability, these complexes demonstrate superior potency in controlling blood glucose levels compared to existing treatments, with IC50 values of less than 10 µg/mL. The invention addresses key limitations of current therapies, offering enhanced efficacy with reduced dosage requirements and minimised adverse side effects. Additionally, the invention provides sustained therapeutic benefits over time, improving long-term disease management. Through comprehensive synthesis and formulation techniques aligned with industrial standards, this invention presents a promising new approach to diabetes management with significant improvements over existing therapies.

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