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Urea-based Small Molecules Inhibit the Aggregation of Human and Feline Amylin for the Treatment of Type 2 Diabetes

Urea-based small molecules inhibit IAPP aggregation in humans and felines for type 2 diabetes treatment.

Researchers at Purdue University have developed a novel class of small molecules which inhibit the formation of feline and human islet amyloid polypeptide (IAPP). Type 2 diabetes is a disease in which approximately 70% of cases involve the accumulation of IAPP. Pancreatic aggregates of IAPP are also reported in 70% of feline and human patients. Currently, there is no cure for type 2 diabetes in humans and felines and no treatment for pancreatic IAPP aggregates.

Purdue researchers discovered three compounds with high efficacy and affinity to both feline and human IAPP. The small molecules reduced aggregation of IAPP at 100 micromolar after 1 hour. These molecules can be utilized as a future therapeutic and to better understand the role of IAPP in feline and human type 2 diabetes.

Technology Validation: The potency of these molecules was validated in vitro by fluorescence assays, dynamic light scattering, and electron microscopy. These methods demonstrated the efficacy, selectivity, and ability to inhibit aggregation of IAPP by these small molecules.

Advantages:

-Inhibits IAPP aggregation

-Bioavailable potential

-Selective

-Moderate to high yield

Applications:

Technology ID
2023-FORT-70255

Category
Agriculture, Nutrition, & AgTech/Food Safety & Traceability
Agriculture, Nutrition, & AgTech/Livestock & Animal Health Solutions
Pharmaceuticals/Drug Discovery & Development

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View online

-Type 2 diabetes

-Protein aggregation inhibition

-Combinational therapy

-Proteopathies

Publications:

Moore KBE, Horgan NG, Lenters B, Fortin JS.Vet Q. 2023 Dec;43(1):1-12. doi: 10.1080/01652176.2023.2260442. Epub 2023 Oct 4.PMID: 37729105 Free PMC article.

https://pubmed.ncbi.nlm.nih.gov/37729105/

Ganegamage SK, Ademoye TA, Patel H, Alnakhala H, Tripathi A, Nguyen CCD, Pham K, Plascencia-Villa G, Zhu X, Perry G, Tian S, Dettmer U, Lasagna-Reeves C, Fortin JS.ACS Chem Neurosci. 2024 Nov 6;15(21):3915-3931. doi: 10.1021/acschemneuro.4c00282. Epub 2024 Oct 22.PMID: 39436010

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TRL: Pharmaceuticals

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