Glymbaxi: A New Drug Designed to Assist Type 2 Diabetes Patients with Glycemic Control

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A Randomized, Open-Label, Crossover Study to Evaluate the Pharmacokinetics of Empagliflozin and Linagliptin After Coadministration in Healthy Male Volunteers

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CHEM 205

Glyxambi (EMPAaglifung/LINagliptin) TABLETS

- 16 male volunteer test subjects
- Randomized multiple dose crossover
- Treatment A: empagliflozin 50 mg - 5 days
- Treatment B: empagliflozin 50 mg and linagliptin 5 mg - 7 days
- Treatment C: linagliptin 5 mg - 7 days
- Treatments done in sequence AB then C or C then AB
- Subjects did not see many adverse side effects (3)
- Conclusion: co-administration had an effect on glycemic control
- Results were in the norm for previous clinical trials (3)

Glyxambi is not synthesized from either of the drugs used to make it.

Researchers performed a diasteroselective synthesis of β-anomers of C-glycosides utilizing an s-face hydride reduction of an enantiomerically stabilized carbene intermediate (7).

Scientists used an acid 1,2-di chloroiodo benzene and replaced the alcohol group using (COCl)2 in DMF then a Friedel Crafts reaction was performed to add a fluorne phenyl group to the carbonyl. Aromatic substitution was performed using (S)-3-hydroxytetrahydrofuran and BuOK in THF (7).

Conclusion:

Empagliflozin was a drug designed from empagliflozin, and linagliptin was a new drug. The new drug was designed to improve glycemic control (6).

- First drug companies to design a drug that combined the mechanisms of SCLT2 and DPP-4 inhibitors to improve glycemic control (6)
- Just recently approved by the FDA
- Has not yet been studied in patients with a history of pancreatitis (6)
- Empagliflozin is an transporter that’s responsible for absorption of glucose from the glomerular filtrate back to circulation (2)
- Linagliptin inhibits DPP-4 an enzyme that degrades incretin hormones and increases the concentrations of active incretin hormones and stimulates the release of insulin (2)
- Incretin hormones are involved in the regulation of glucose homeostasis, they are secreted at low levels throughout the day and rise immediately after meals (2).

Eli Lilly and Boehringer Ingleheim Pharmaceuticals