

Supplementary methods

Inclusion criteria

Patients who meet any of the following criteria are eligible for study participation.

1. Patients with type 2 diabetic mellitus (T2DM) ≥ 20 aged
2. Patients who are treated with dipeptidyl peptidase-4 inhibitor for at least 3 months before informed consent with metformin sulfonylurea inadequately controlled with glycosylated hemoglobin $\geq 7.5\%$ before study
3. Patients who agreed with a written informed consent

Exclusion criteria

1. Diabetes patients other than T2DM (e.g., T1DM, pancreatic disease, secondary diabetes)
2. History of continuous basal insulin treatment within 3 months before screening
3. History of diabetic acidosis (including keto-acidosis) within 1 year before screening
4. History of myocardial infarct, stroke or heart failure related admission within 3 months before screening
5. History of drug or alcoholic abuse within 6 months before screening
6. Weight change ≥ 5 kg within 3 months before screening
7. History of hypoglycemic unawareness
8. Systolic blood pressure > 180 mm Hg or diastolic blood pressure > 110 mm Hg regardless of taking anti-hypertensive, or uncontrolled hypertension
9. Active malignant cancer, major systemic disease, clinically significant diabetic retinopathy, macular edema necessitating laser treatment, abnormal clinical finding from physical examination, lab analysis, electrocardiogram (EKG) or vital sign, which can be regarded as to prevent safe completion of clinical study or to make efficacy assessment difficult by investigator or co-investigator at screening
10. Pregnant or lactating women
11. Women of child bearing potential (pre-menopause or not surgically infertile within 3 months before screening) who match two conditions below
 - Negative serum pregnancy test at screening
 - Using medically proven effective contraceptive method
12. Hypersensitivity to investigational drugs
13. Lab finding at screening
 - Abnormal liver function: alanine transaminase or aspartate transaminase > 3 times of upper limit of normal range
 - Renal insufficiency: men with serum Cr ≥ 1.5 mg/dL (≥ 133 $\mu\text{mol/L}$), women with serum Cr ≥ 1.4 mg/dL (≥ 124 $\mu\text{mol/L}$)
 - Use of anti-obese drug within 3 months before screening
 - Has been using drugs that can influence glucose metabolism (systemic corticosteroid, thyroid hormone) within 3 months before screening or has possibility of using these drugs during the investigational period
 - Has participated in clinical studies of any investigational drugs within 3 months before screening
14. Considered not physically or psychologically appropriate to participate in clinical study by investigator
15. Not willing to comply with scheduled visit, self-inject insulin, or self-monitor blood glucose level