INTRODUCTION

Rapid double antigen bridging immunogenicity assays for the detection of anti-drug antibodies (ADA) to peptide drugs Glucagon and Glucagon-like Peptide-1 (GLP-1) have been successfully developed.

The assays require no sample dilution and no washing steps which can perturb fragile complexes formed by low-affinity ADAs. No dilution improves the detection of low titer ADAs.

Principle of the Rapid Immunogenicity Assay

Handheld Readers and Rapid Assay Test Kit

The NIDS® handheld reader (left) is for on-site rapid testing, and the medical reader (right) is for quantitative Point of Care testing (POCT).

Advantages of the NIDS® Rapid Immunogenicity Assay
1. No sample dilution
2. No wash steps
3. Fixed Screening Cut-point
4. Fast
5. Accurate
6. Easy to use
7. Affordable

Rapid Bridging Immunogenicity Assay dose response curve with rabbit anti-Glucagon antibody spiked into human serum pool

Glucagon Rapid Immunogenicity Assay

Assay Sensitivity = 125 ng/mL ADA

Glucagon Depletion Assay in neat human serum

500 ng/mL of rabbit anti-Glucagon and increasing amounts of free drug were spiked in a human serum pool and incubated at RT for 1 hour before testing

Evaluation of Positive Samples in the Drug Depletion Assay

Using the calculated screening cut-point, a 6% false positive rate (6/98) was calculated for the combined limited population of obese/diabetic and normal samples tested. Samples 9, 31 and 37 from the normal samples and samples 277, 300, and 305 from the obese population were above the calculated screening cut-point. Sample 7 was excluded from the calculation as an outlier. Using the fixed reader cut-off, three possible positive samples (no. 7, 9, and 300) were identified and subsequently tested in a drug depletion assay.

Evaluation of Normal Human Serum Samples in the Glucagon Rapid Immunogenicity Assay

After repeat testing and running the depletion assay, Sample no.9 was confirmed a true positive, while samples 28 and 32 which were borderline positive were retested as negative. Sample 7 was the only true false positive.

Rapid Bridging Immunogenicity Assay dose response curve with rabbit anti-GLP-1 antibody spiked into human serum pool

GLP-1 Rapid Immunogenicity Assay

Assay Sensitivity = 250 ng/mL ADA

GLP-1 Depletion Assay in neat human serum

500 ng/mL of rabbit anti-GLP-1 and increasing amounts of free drug were spiked in a human serum pool and incubated at RT for 1 hour before testing

Evaluation of Positive Samples in the Drug Depletion Assay

After repeat testing and running the depletion assay, Sample 9 was retested as negative. Samples 7 and 300 were the only true false positives.

Evaluation of 50 Normal Human Serum Samples and 50 Serum Samples from Obese and Diabetic Patients in the GLP-1 Rapid Immunogenicity Assay

Using the calculated screening cut-point, a 4% false positive rate was determined for the limited population tested. Samples 7 and 9 were excluded as an outlier and a true positive sample respectively. Using the fixed reader cut-off, four possible positive samples (no. 7, 9, 28, and 32) were identified and subsequently tested in a drug depletion assay.

Evaluation of Positive Samples in the Drug Depletion Assay

After repeat testing and running the depletion assay, Sample no.9 was confirmed a true positive, while samples 28 and 32 which were borderline positive were retested as negative. Sample 7 was the only true false positive.