



Bioanalytical & Biomarker Services

Tissue PK and Biomarker Analysis

KCAS supports bioanalytical preclinical and clinical development for biologics and small molecules. Our experienced scientific team provides custom assay development, validation, sample processing and consulting services for a wide variety of applications. We pride ourselves on being innovative problem solvers and it's our top priority to help clients overcome any challenges encountered while developing and qualifying/validating tissue assays for PK and biomarker analysis.

Applications

Tissue analysis is a critical aspect of pharmacokinetic and biomarker analysis for certain biologics and small molecules. The major challenges are in the homogenization process and preparation of the sample for PK and biomarker assays. At KCAS we have experience developing, transferring and qualifying/validating a wide range of tissue PK and biomarker assays in support of preclinical and clinical trials.

Tissues

KCAS specializes in a variety of tissues and species.

| | |
|--|-----------------------|
| Arterial | Pig |
| Bladder | Dog, Pig, Rat |
| Brain & Spinal Cord | Dog, Monkey, Rat |
| Diaphragm, Abdominals, Quadriceps, Soleus, Psoas Gastrocnemius | Mouse |
| Emesis | Dog |
| Heart, Liver, Lung, Kidney | Dog, Monkey, Pig, Rat |
| Nail, Tumor, Sputum, Nerve | Human |
| Skin | Cat, Pig |

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Case Study

Challenge

- The client had performed a 'legacy' tissue biomarker assay in house for seven years and the assay was a burden on R&D resources
- The client needed a CRO that could successfully achieve method transfer and qualification within a stringent eight week timeline
- The client would use the preclinical results to make decisions for clinical trials

Solution

Our scientific team has extensive experience processing tissues and recommended a study design that successfully transferred and qualified the assay within the eight week timeline. While transferring the assay, KCAS proposed improving the sensitivity of the assay and improved the dilution linearity of the assay, which resulted in significant cost savings when testing samples.

Results (See Figure 1 on back)

KCAS transferred and qualified the assay in six weeks and the standard curve was expanded from 12.5-200 to 6.25-400 ug/mL.

Conclusion (See Figure 2 on back)

- KCAS successfully transferred the assay two weeks ahead of schedule
- We completed testing for Cohort 1 three weeks ahead of schedule
- The client expanded tissues from three to five tissues for Cohort 2 and future cohorts
- KCAS has tested more than 2,500 samples from three separate studies without a single failed assay

Figure 1

| PARAMETER | EXPERIMENTAL DESIGN | TARGET SPECIFICATIONS | QUALIFICATION RESULTS |
|---|---|--|---|
| STANDARDS (System Suitability) | | | |
| 50 µg/mL – 1600 µg/mL (Adjusted Concentration) | # of Runs: 3 or more # of Standard: 6 # of wells/point: 2 | Accuracy: AR = 80 to 120% Precision: CV ≤ 20% (Except at lowest and highest standard Accuracy and Precision = within 25%) | Accuracy (AR): 93.2 – 103.9% Precision (CV): 0.9 – 11.8% |
| ACCURACY & PRECISION (Inter and Intra) | | | |
| 4 levels of QS | # of Runs: 3 or more # of QS Replicates/run: 3 or more # of wells/point: 2 | Precision & Accuracy (%CV and AR): As shown below | |
| 720 µg/mL | QS Level 1 | CV ≤ 20%, %RE = -30 to 10% | CV: 4.2% RE: -2.0% |
| 500 µg/mL | QS Level 2 | CV ≤ 20%, %RE = -30 to 10% | CV: 3.6% RE: -4.6% |
| 250 µg/mL | QS Level 3 | CV ≤ 20%, %RE = -30 to 10% | CV: 3.9% RE: -10.0% |
| 125 µg/mL | QS Level 4 | CV ≤ 20%, %RE = -30 to 10% | CV: 3.6% RE: -12.8% |

Figure 2

