A Sensitive LC/MS/MS Method for the Quantification of Telmisartan in Human Plasma

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Experimental

System
- G1311B 1200 Infinity binary pump
- G1320H 1200 Infinity micro degasser
- G13640 1200 Infinity autosampler
- G13620 1200 Infinity Thermostat
- G13794A 1200 Infinity Thermostatted Column Compartment

Source: 205/240A Eclipse Plus - CE 3.4 x 55 mm, 1.8 µm
Column temperature: 60 °C

Mobile phase A: 10 mM Ammonium acetate
Mobile phase B: Acetonitrile
Flow rate: 0.5 mL/min

Preparation of the mobile phase:
- 1000 µL of mobile phase A was transferred to a new microcentrifuge tube and diluted with water. The residue was reconstituted in 200 µL of 0.1% (v/v) acetonitrile and centrifuged prior to analysis.

Results and Discussion

No peak was seen for the telmisartan transition in the first plasma blank injected after injecting the LLOQ sample (500 pg/mL). Three more LC/MS/MS runs were used for the determination of the calibration plot as shown in Figure 3. The figures show the selectivity of the telmisartan peaks in the LOD and blank samples. It can be seen that the area of the MRM signal in the blank is less than 20% of the area of analyte peak in the LOD sample confirming that the carryover meets the FDA biosafety recommended criteria.

All plasma samples were treated with 500 µL of cold acetonitrile and then vortexed for 30 s. 80% of supernatant was transferred to a new microcentrifuge tube and diluted with vacuum concentration. The residue was reconstituted in 200 µL of 0.1% (v/v) water/methanol, and centrifuged prior to analysis.

Figure 3: First blank injected after the LLOQ sample injections

Figure 4: Telmisartan peak in the LOD (50 pg/mL) sample

Table 1: Response ratios, precision and accuracy at the various concentration levels

Conclusions

Each calibration and QC sample was injected three times. The mean response ratios of telmisartan to telmisartan-d5 were plotted against the concentrations of telmisartan to obtain the calibration curve. A linear curve fitting was used and weighted (1/x). A linear dynamic range of 50 - 5000 pg/mL was achieved for telmisartan in human plasma with an R² value greater than 0.995. Figure 6 shows a representative calibration curve for telmisartan in plasma using telmisartan-d5 as the internal standard. From Table 1 it can be seen that the calculated concentrations for all calibration standards and the QC samples show good precision and accuracy.