Abstract

This bachelor thesis aimed to develop a UHPLC-MS/MS method for the determination of nilotinib in rat serum. The developed UHPLC-MS/MS method was used to monitor the pharmacokinetic release of the active substance in a rat model organism in a project focused on the formulation of a tablet containing nilotinib with a slower release than before.

The optimal conditions of the method were as follows. Chromatographic column Acquity UPLC BEH PHENYL 100x2.1 mm, 1.7 µm from Waters. The mobile phase consisted of methanol and distilled water, both with the addition of 0.1% formic acid using gradient elution. The flow rate of the mobile phase was 0.3 mL/min, the temperature in an autosampler 15 °C, the column temperature 40 °C, the analysis time 6.5 minutes, and the injection volume 2 µl. The MRM transition monitored for nilotinib was: 530.2 → 289.10 (Q1 = -26 V; CE = -31 V; Q3 = -20 V) and for nilotinib D6: 536.2 → 295.15 (Q1 = -26 V; CE = -31 V; Q3 = -14 V). The setting of the ion source was as follows: nebulizing gas flow 3 L/min; drying gas flow 10 L/min; source temperature 300 °C; desolvation capillary temperature 250 °C.

The method was partially validated. The coefficient of determination 1.0000 shows the excellent linearity of the method. The accuracy, expressed as a relative error, was up to 20 %. The accuracy, expressed by RSD, was up to 9 %. All values meet the validation criteria of the bio-analytical method.

Key words: UHPLC-MS/MS, nilotinib, rat serum