

Publication

Validation of UHPLC-MS/MS methods for the determination of kaempferol and its metabolite 4-hydroxyphenyl acetic acid, and application to in vitro BBB and intestinal drug permeability studies

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 3539167**Author(s)** Moradi-Afrapoli, Fahimeh; Oufir, Mouhssin; Walter, Fruzsina R.; Deli, Maria A.; Smieško, Martin; Zabela, Volha; Butterweck, Veronika; Hamburger, Matthias**Author(s) at UniBasel** [Hamburger, Matthias](#) ; [Moradiafrapoli, Fahimeh](#) ; [Oufir, Mouhssin](#) ; [Smiesko, Martin](#) ; [Zabela, Volha](#) ;**Year** 2016**Title** Validation of UHPLC-MS/MS methods for the determination of kaempferol and its metabolite 4-hydroxyphenyl acetic acid, and application to in vitro BBB and intestinal drug permeability studies**Journal** Journal of Pharmaceutical and Biomedical Analysis**Volume** 128**Pages / Article-Number** 264-274

Sedative and anxiolytic-like properties of flavonoids such as kaempferol and quercetin, and of some of their intestinal metabolites, have been demonstrated in pharmacological studies. However, routes of administration were shown to be critical for observing in vivo activity. Therefore, the ability to cross intestinal and blood-brain barriers was assessed in cell-based models for kaempferol (KMF), and for the major intestinal metabolite of KMF, 4-hydroxyphenylacetic acid (4-HPAA). Intestinal transport studies were performed with Caco-2 cells, and blood-brain barrier transport studies with an immortalized monoculture human model and a primary triple-co-culture rat model. UHPLC-MS/MS methods for KMF and 4-HPAA in Ringer-HEPES buffer and in Hank's balanced salt solution were validated according to industry guidelines. For all methods, calibration curves were fitted by least-squares quadratic regression with $1/X^2$ as weighing factor, and mean coefficients of determination (R^2) were >0.99 . Data obtained with all barrier models showed high intestinal and blood-brain barrier permeation of KMF, and no permeability of 4-HPAA, when compared to barrier integrity markers.

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