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20 anos CROMATOGRAFIA

11th NATIONAL MEETING ON CHROMATOGRAPHY

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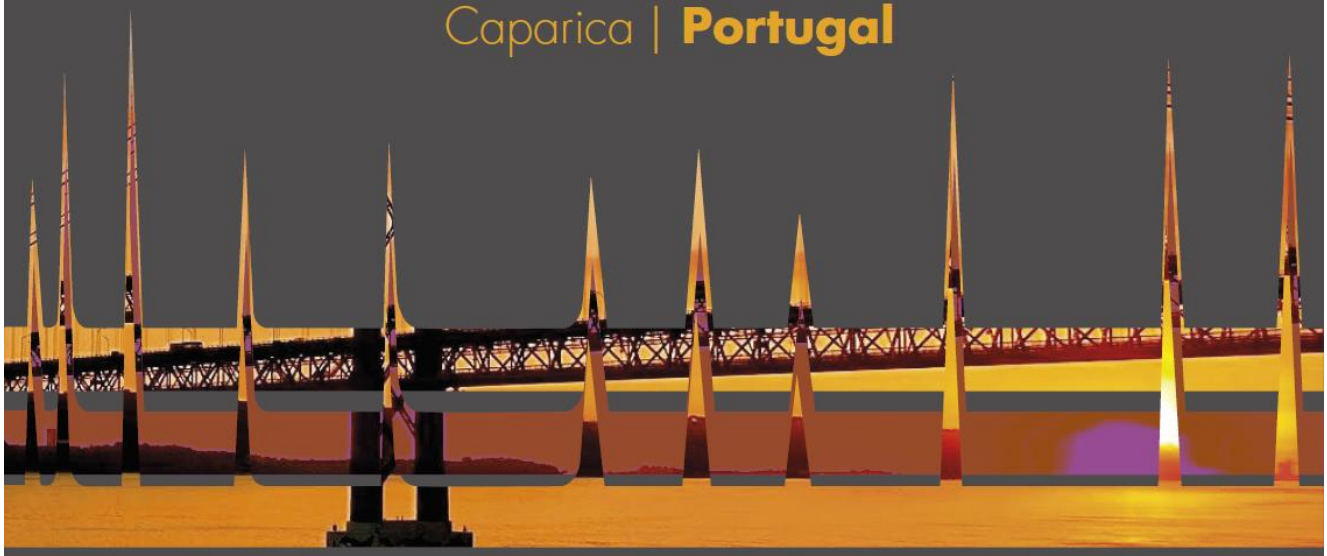

Faculdade de Ciências e Tecnologia,
Universidade NOVA de Lisboa

Sociedade Portuguesa de Química

FCT Faculdade de Ciências e Tecnologia Universidade Nova de Lisboa

Universidade de Évora

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Authors
Eduardo Mateus (Universidade Nova de Lisboa)
José Manuel F. Nogueira (Universidade de Lisboa)
Marco Gomes da Silva (Universidade Nova de Lisboa)
Maria João Cabrita (Universidade de Évora)

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e-mail: 11enc@chemistry.pt

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P16 Analytical strategies based on tandem mass spectrometry detection for quantification of bioactive compounds in biological matrices

Luisa Barreiros,[1,2] Sara R. Fernandes,[1,2] Sandia Machado,[1] Eduarda M. P. Silva,[1] Marcela A. Segundo[1]

[1] *LAQV, REQUIMTE, Departamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Rua Jorge Viterbo Ferreira 228, 4050-313 Porto, Portugal*

[2] *Escola Superior de Saúde, Instituto Politécnico do Porto, Rua Dr. António Bernardino de Almeida 400, 4200-072 Porto, Portugal*

Email: lbarreiros@ff.up.pt

Fast and accurate analysis, providing reliable results at trace concentration levels, is a current demand of the modern world. This pressure is justifiable in limit situations but also in our daily life, for instance when waiting for a diagnosis based on lab results in a hospital or when wondering about the quality of water running from our taps. During the last years, tandem mass spectrometry (MS/MS) based techniques have become the method of choice for determination of chemical compounds in complex matrices due to their inherent high sensitivity and selectivity. MS/MS techniques allow the achievement of low limits of detection and therefore prompt for the quantification of trace analyte levels generally present in environmental and biological samples. The majority of applications rely on the coupling to a separative technique prior to MS/MS detection. In this work, relevant applications of the association HPLC-MS/MS for quantification of bioactive compounds in biological matrices will be critically discussed. The steps of sample preparation and analytical determination will be addressed. Moreover, the main analytical features of each developed method, including selectivity, accuracy, precision, limits of detection (LOD) and quantification (LOQ), stability and matrix effects will be highlighted.

First, despite the recognition of tranexamic acid (TXA) as an important antifibrinolytic drug, there is a lack of pharmacokinetic and pharmacodynamic data concerning variable age groups undergoing surgeries with high blood loss. Clinical trials performed so far suggest a wide variability in response to TXA and, therefore, the implementation of a methodology based on UHPLC-MS/MS for monitoring TXA in human plasma samples at sub-microgram per milliliter levels was pursued.[1] In a different context, millions of people worldwide live with human immunodeficiency virus (HIV) infection raising the continuous search for new prevention and treatment strategies, including topical microbicide products combining antiretroviral drugs such as tenofovir (TFV) and efavirenz (EFV). An HPLC-MS/MS method was developed targeting the quantification of antiretrovirals in mice tissue and fluid samples recovered from a pharmacokinetics study with nanoparticles and it was fully validated for the different biological matrices.[2]

Finally, BIBP 3226 is a potent and selective neuropeptide Y Y1 receptor antagonist that has been successfully used in *in vitro* studies showing a positive impact in bone turnover and thus providing good perspectives towards its application as a pharmacological tool for bone regeneration. Having in mind the therapeutic potential of BIBP 3226 and also the need to elucidate receptor-antagonist internalization mechanisms, the challenge was to develop a methodology based on HPLC-MS/MS that permitted to quantify the low quantities of antagonist expected to be internalized by cells.

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