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MEETING ABSTRACT

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Cytotoxic, antiradical activity and limited stability of anthocyanidins in human cell cultures

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Background: Anthocyanins (ACs) are molecules where a sugar moiety is bound to another non-sugar functional group (aglycone: anthocyanidin; ACdn). Numerous studies have shown that both ACs and ACdns are biologically active. The ACdns are limited to a few structure variants, such as delphinidin, cyanidin, pelargonidin, peonidin and malvidin. Although effects of ACdns have been studied in antioxidant and cell proliferation assays, their metabolism in biological fluids and different cell line culture *in vitro* assays is still to be investigated [1,2,3].

Objectives: The aim of this study was to compare biological activity of malvidin (**M**), delphinidin (**D**) and cyanidin (**C**) in different human cell lines, and to study their metabolism in cell culture environment.

Methods: Influence on cell proliferation of ACdns (Sigma-Aldrich, USA) at concentrations of 25, 50 and 100 µM was investigated by using ViaCount and CCK-8 tests; antiradical activity was analysed using DPPH assay. Stability of ACdns in cell culture media after 24 h was evaluated by UHPLC-TOF-MS/MS method. The following human commercial cell lines have been used: monocytic leukemic cell line THP-1 (ECACC, UK), adipose mesenchymal stem cells (aMSCs), breast adenocarcinoma cell line MCF-7 and metastatic breast adenocarcinoma cell line MDA-MB-231 (ATCC, USA).

Results: ACdns inhibited growth of THP-1 and aMSCs, whereas their effects on MCF-7 and MDA-MB-231 cell proliferation was negligible. **D** showed the most obvious anti-proliferative effect. **C** exerted stronger antiradical activity. ACdns were not detected in the cell supernatants after 24 h. Instead, we identified phenolic acids, the main metabolites of ACdns, namely, metabolite of **C**: protocatechuit acid (PA), metabolite of **D**: gallic acid (GA), and metabolite of **M**: syringic acid (SA). Concentrations of PA and SA increased accordingly to the added concentration of ACdns with the exception of GA. GA was not identified in aMSC cell medium, but in THP-1 and MCF-7 cells the level of GA did not reflect the added amount of **D**.

Conclusions: ACdns possess cell line-selective cytotoxicity and limited life time in cell culture. The influence of solvents and oxidizing substances in cell media is under investigation.

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