High sensitivity screening of antineoplastic drugs using a 1 mm diameter YMC-Triart C18 UHPLC column

Antineoplastic drugs are commonly used for the treatment of cancer. On the one hand they are life-saving for the ever-increasing number of affected people, on the other hand they can be harmful to people who are exposed to them including pharmacists, nurses and other staff members. Due to their adverse health effects, a detection process which is reliable and highly sensitive is very important. Even very low residual concentrations that occur e.g. on surfaces in hospitals or pharmacies need to be reliably monitored.

In this application note, the screening of 6 antineoplastic drugs is shown.

A YMC-Triart C18 UHPLC column was used with an internal diameter of 1 mm. Due to the need of high sensitivity results where even the smallest amounts of these drugs need to be detected, a small internal column diameter is the ideal choice. By coupling it to mass spectrometry (MS) it becomes the perfect fit in order to detect low sensitivity compounds or low sample amounts with high sensitivity. Furthermore, also resources and costs can be reduced by miniaturising the analysis. Due to this smaller diameter compared to standard columns less mobile phase is used and also cycle times can be accelerated.
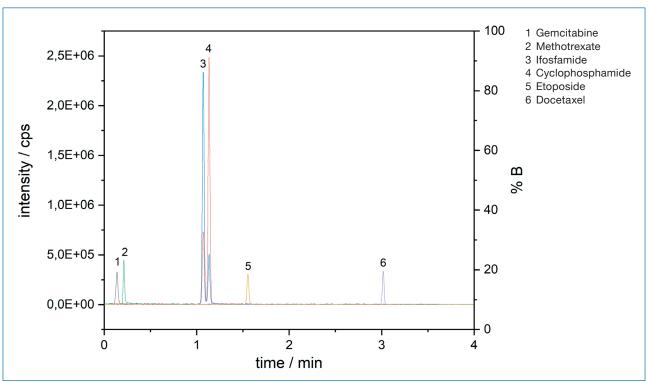

Figure: Separation of 6 antineoplastic drugs using a 1 mm YMC-Triart C18 UHPLC column.

Column:	YMC-Triart C18 (1.9 µm, 12 nm) 50 x 1 mm ID
Part No.:	TA12SP9-0501WT
Eluent:	A) H_2O + 0.1% formic acid
	B) acetonitrile + 0.1% formic acid
Gradient:	10%B (0–0.05 min), 10–50%B (0.05–2.85 min),
	50–99%B (2.85–3.55 min), 99%B (3.55–4.00 min)
Flow rate:	278 µL/min
Temperature:	30 °C
Detection:	ESI-MS
Injection:	100 nL
Sample:	(1) gemcitabine, (2) methotrexate, (3) ifosfamide,
	(4) cyclophosphamide, (5) etoposide, (6) docetaxel (1 µg/mL)
Instrument:	LC) Shimadzu Nexera Mikros
	MS) Shimadzu MS 8060

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