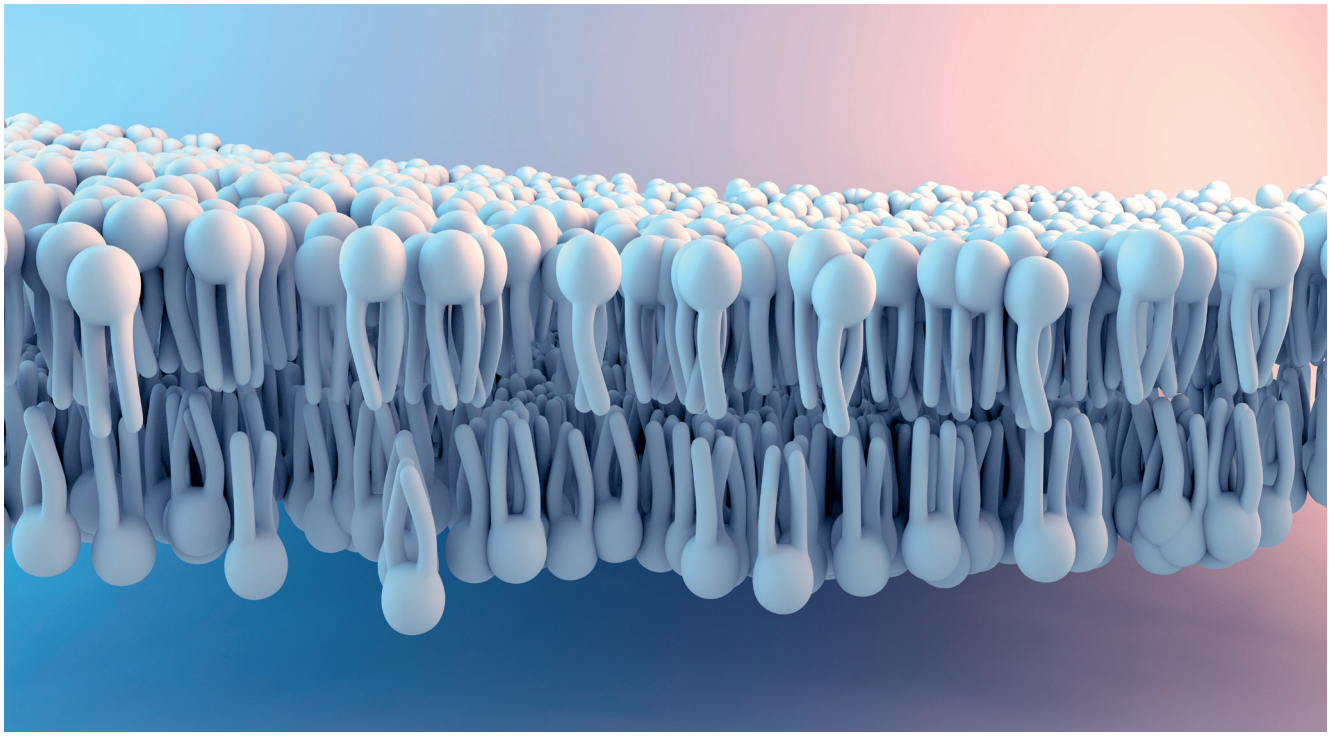
Fast UHPLC Analysis of Cell Penetrating Peptides Using a YMC-Triart C18 column

Therapeutic agents are often required inside cells which requires them to be transported across the cell membrane. Cell-penetrating peptides (CPPs) are not only capable of transporting themselves across the cell membrane but are also able to transport so-called “cargo” with them.

This cargo can be various compounds such as peptides, polymers and certain small molecules. Other transport mechanisms often show high toxicity, low efficiency and specificity which is why CPPs are so interesting in current research.



CPPs are useful in diagnostic and therapeutic applications, such as in the treatment of cancer, diabetes or inflammation. The first CPP discovered was the transactivating transcriptional activator from human immunodeficiency virus 1 (HIV-1 Tat protein) in the 1980s. Since that time more CPPs have been discovered including octaarginine or penetratin.
Because CPPs often contain a high number of basic amino acids, efficiently endcapped stationary phases are required for their analysis. YMC-Triart C18 hybrid silica is a multi-stage endcapped stationary phase which makes it an ideal choice for the basic CPPs octaarginine, HIV-1 Tat protein and penetratin due to the absence of peak tailing.
In Figure 1 the separation of these three CPPs is shown using a YMC-Triart C18 UHPLC column which provides sharp peaks for a fast analysis in under four minutes.

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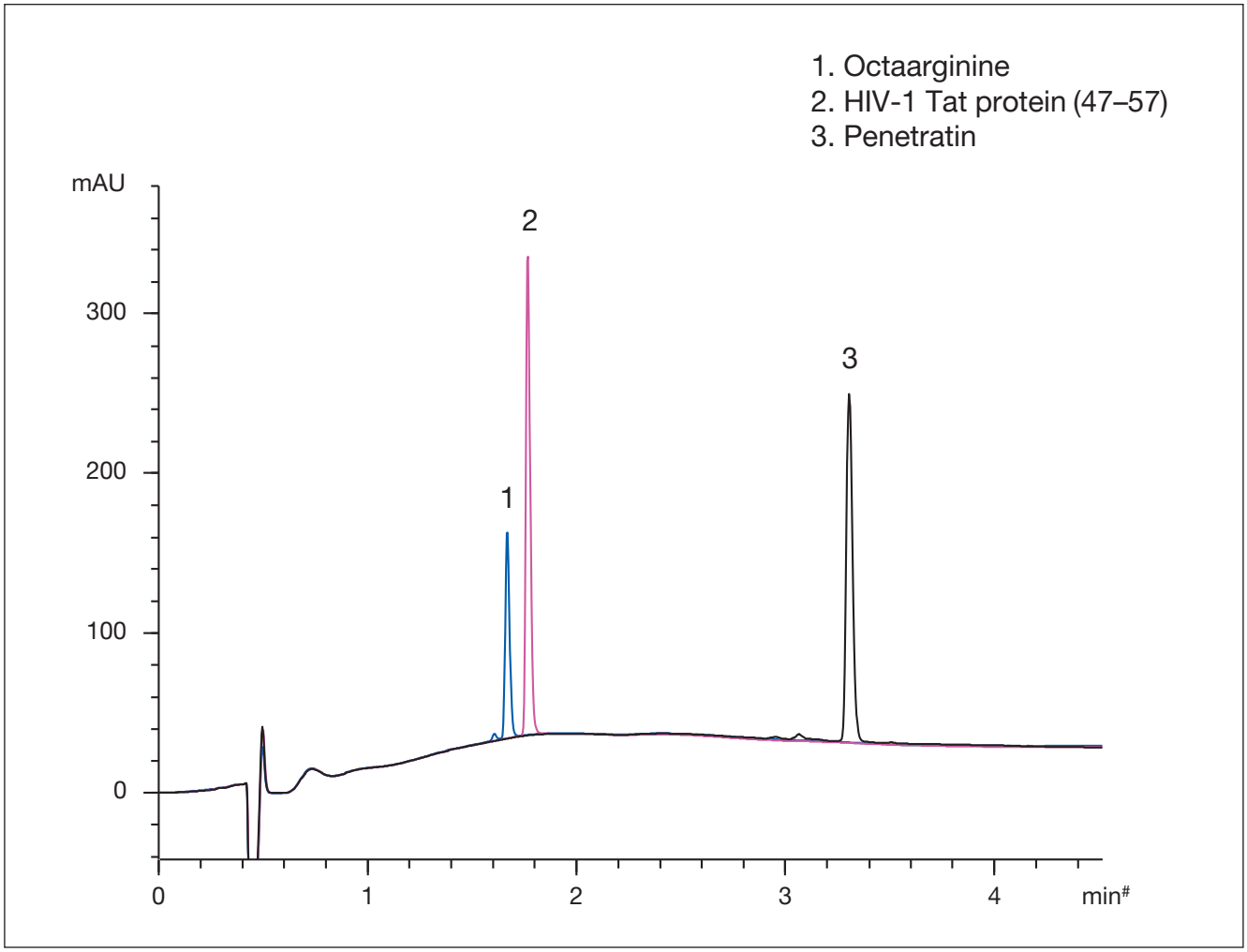

Figure 1: Separation of octaarginine, HIV-1 Tat protein and penetratin using a YMC-Triart C18 UHPLC column.

Table 1: Chromatographic conditions.

Column:	YMC-Triart C18 (1.9 µm, 12 nm) 50 x 2.1 mm ID
Part No.:	TA12SP9-05Q1PT
Eluent:	A) water/TFA (100/0.1) B) acetonitrile/TFA (100/0.08)
Gradient:	5–25%B (0–2.5 min), 25%B (2.5–5 min)
Flow rate:	0.4 mL/min
Temperature:	40°C
Detection:	UV at 210 nm
Injection	2 µL (0.05~0.5 mg/mL)

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