APPLICATION NOTE

The supremacy of bioinert coated hardware in oligonucleotide analysis using YMC Accura BioPro IEX QF

Oligonucleotides can be used to modulate gene expression, which provides a huge potential in treatment of a wide range of diseases. The field of therapeutic oligonucleotides is rapidly growing, demanding robust and sensitive analytical methods to ensure product quality and safety.

Anion exchange chromatography (AEX) is a suitable tool for oligonucleotide analysis. However, oligonucleotides tend to exhibit poor peak shape, leading to low recovery. One major reason is their adsorption to the column hardware. Tedious passivation with precious sample provides only insufficient improvement. Reproducible analyses can be achieved by using bioinert coated hardware, as provided by YMC Accura BioPro IEX QF columns. The combination of the rigid stationary phase BioPro IEX QF with a bioinert coated hardware enables reliable results from the first analysis.

The analysis of a 21mer RNA showed strong adsorption when using a standard PEEK column (see Figure 1). Even consecutive injections did not significantly improve the analysis. In contrast, with a bioinert coated YMC Accura BioPro IEX QF column, superior peak shape and excellent recovery were achieved from the first injection (see Figure 1).

Table 1: Chromatographic conditions.

Columns:	YMC Accura BioPro IEX QF (5 µm) 100 x 4.6 mm ID (bioinert coated hardware) BioPro IEX QF (5 µm) 100 x 4.6 mm ID (standard hardware)
Part Nos.:	QF00S05-1046PTC QF00S05-1046WP
Eluent:	A) 20 mM Tris-HCl (pH 8.1) B) 20 mM Tris-HCl (pH 8.1) containing 1.0 M $NaClO_4$
Gradient:	25–40%B (0–15 min), 40%B (15–20 min)
Flow rate:	1.0 mL/min
Temperature:	60 °C
Detection:	UV at 260 nm
Injection:	4 µL (5 nmol/mL)
Sample:	21mer RNA
System:	bioinert HPLC

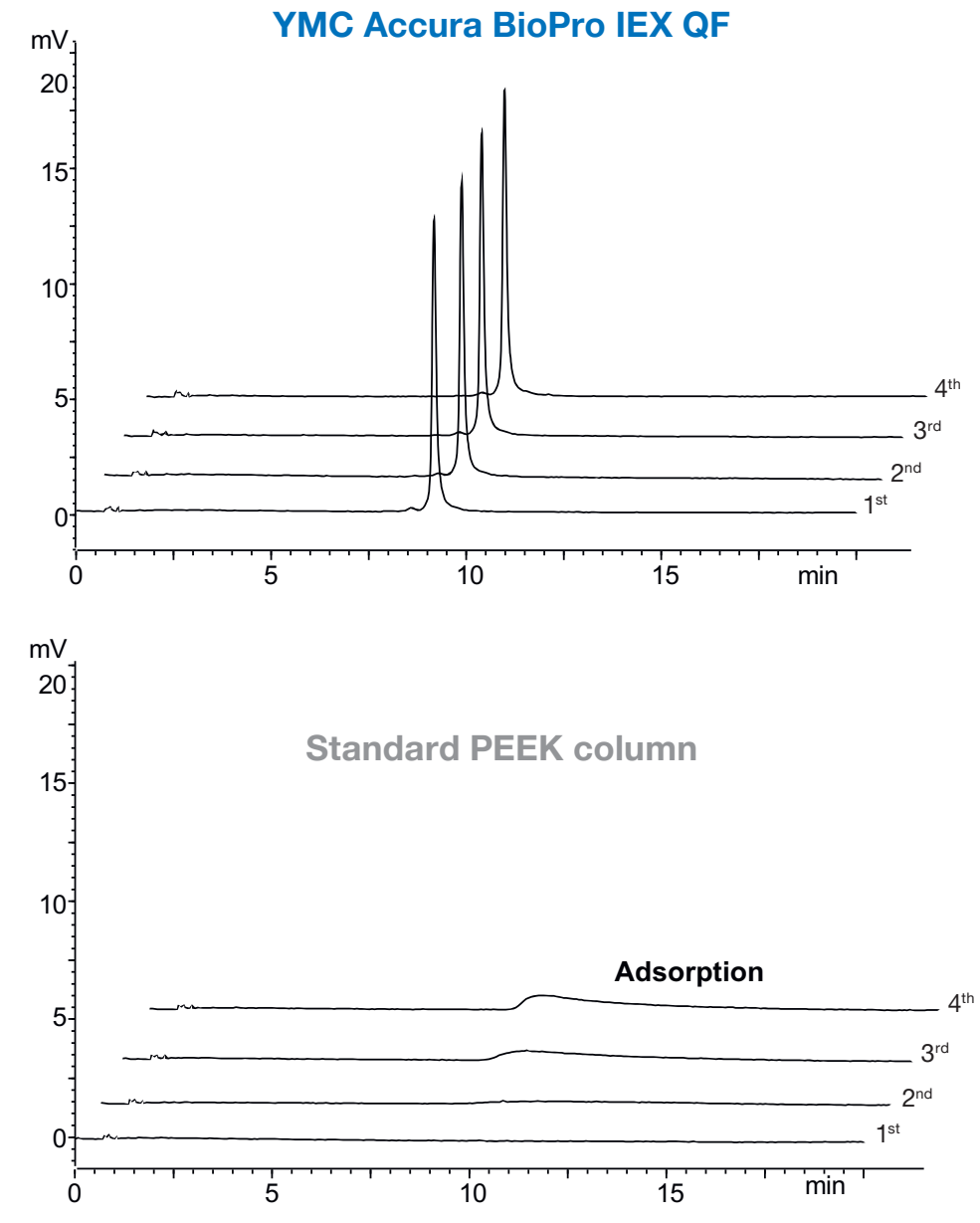

Figure 1: Successful analysis of a 21mer RNA using the YMC Accura BioPro IEX QF in comparison to a standard PEEK column.