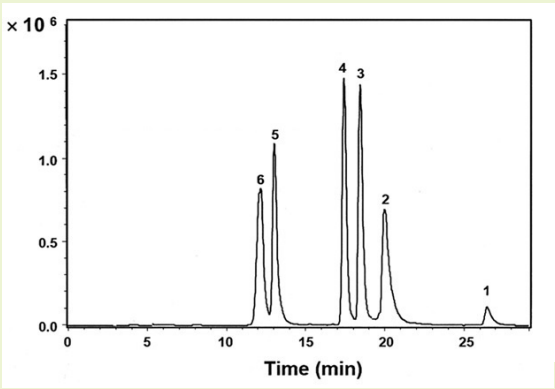
Hydrophobic and Hydrophilic Peptides

Simultaneous Separation using a Capillary Column

Peptide code	Sequence	Calculated hydrophobicity	*pI*
1	H-Gly-Arg-Ala-Asp-Ser-Pro-Lys-OH	−2.31	9.4
2	H-Lys-Gln-Ala-Gly-Asp-Val-OH	0.35	5.8
3	H-Tyr-Ile-Gly-Ser-Arg-OH	4.11	9.1
4	H-Trp-His-Trp-Leu-Gln-Leu-OH	9.65	7.1
5	H-Tyr-Gly-Gly-Phe-Leu-OH	10.61	5.5
6	H-Tyr-Tyr-Tyr-Tyr-Tyr-Tyr-OH	11.34	5.5



Notes: The data and discussion presented here are delineated in greater detail in a full research article. Reference: R.I. Boysen, Y. Yang, J. Chowdhury, M.T. Matyska, J.J. Pesek, M.T.W. Hearn, "Simultaneous separation of hydrophobic and hydrophilic peptides with a silica hydride stationary phase using aqueous normal phase conditions." J. Chromatogr. A, 2011, 1218, 8021–8026.

Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 100Å

Catalog No.: R&D capillary column

Dimensions: 0.3 x 150 mm

Solvents: A: DI H_2O/ 0.5% formic acid (v/v)
B: Acetonitrile/ 0.5% formic acid (v/v)

Gradient:

time (min.)	%B
0	90
5	90
10	70
20	60
20.1	30
30	30

Injection vol.: 0.1µL

Flow rate: 4µL/min

Detection: ESI – POS - Agilent 6210 MSD TOF mass spectrometer

Samples: 10 µg/mL of each peptide in 50% solvent A/ 50% solvent B.

Peaks: 1. H-Gly-Arg-Ala-Asp-Ser-Pro-Lys-OH
2. H-Lys-Gln-Ala-Gly-Asp-Val-OH
3. H-Tyr-Ile-Gly-Ser-Arg-OH
4. H-Trp-His-Trp-Leu-Gln-Leu-OH
5. H-Tyr-Gly-Gly-Phe-Leu-OH
6. H-Tyr-Tyr-Tyr-Tyr-Tyr-Tyr-OH

Discussion

The studied analytes comprised some very hydrophobic and hydrophilic peptides with diverse isoelectric points (pI) and thus served as useful probes to explore the potential of the Cogent Diamond Hydride column in this field of bioanalysis. The figure shows how these peptides of widely disparate physicochemical properties could be separated in a single run. With these capabilities, laboratories can be more efficient and increase throughout by not having to perform separate analyses for both hydrophobic and hydrophilic peptides using different columns.

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