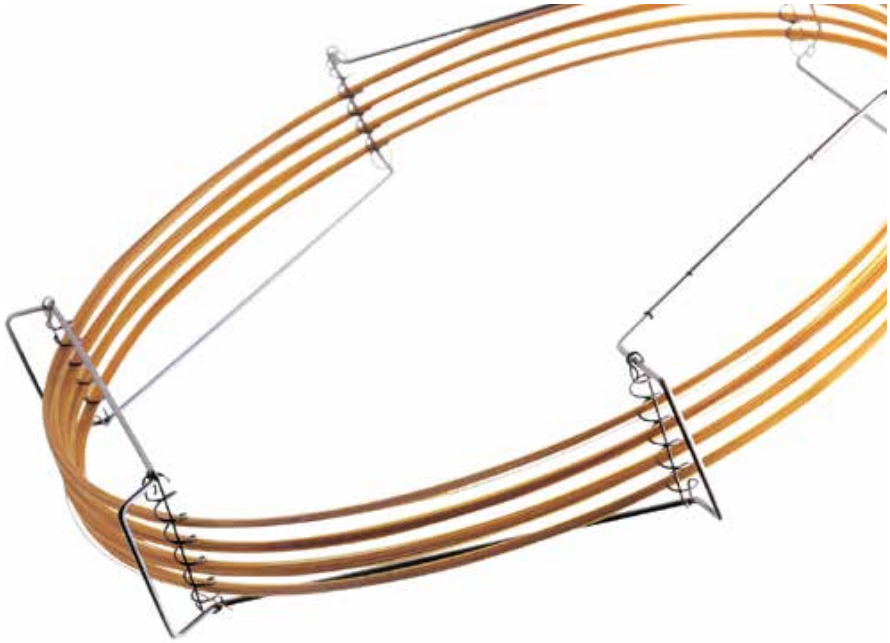
SGE GC column









Reliable | Low bleed
Robust

BP5MS GC column

Excellent performance for your MS analysis

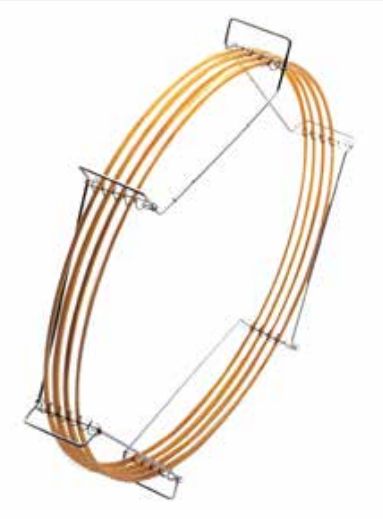
TRAJAN

www.trajanscimed.com

Trajan Scientific and Medical is a vertically integrated manufacturer of gas chromatography columns, with all aspects of column manufacture controlled at one site.

Our BP5MS GC column has been designed to provide excellent performance in the areas of column bleed, activity, selectivity and robustness.

Reliable | Low bleed
Robust



GC column | BP5MS

Bleed

Our BP5MS column has been designed with low bleed performance as a criteria. Figure 1 shows the bleed performance of the BP5MS.

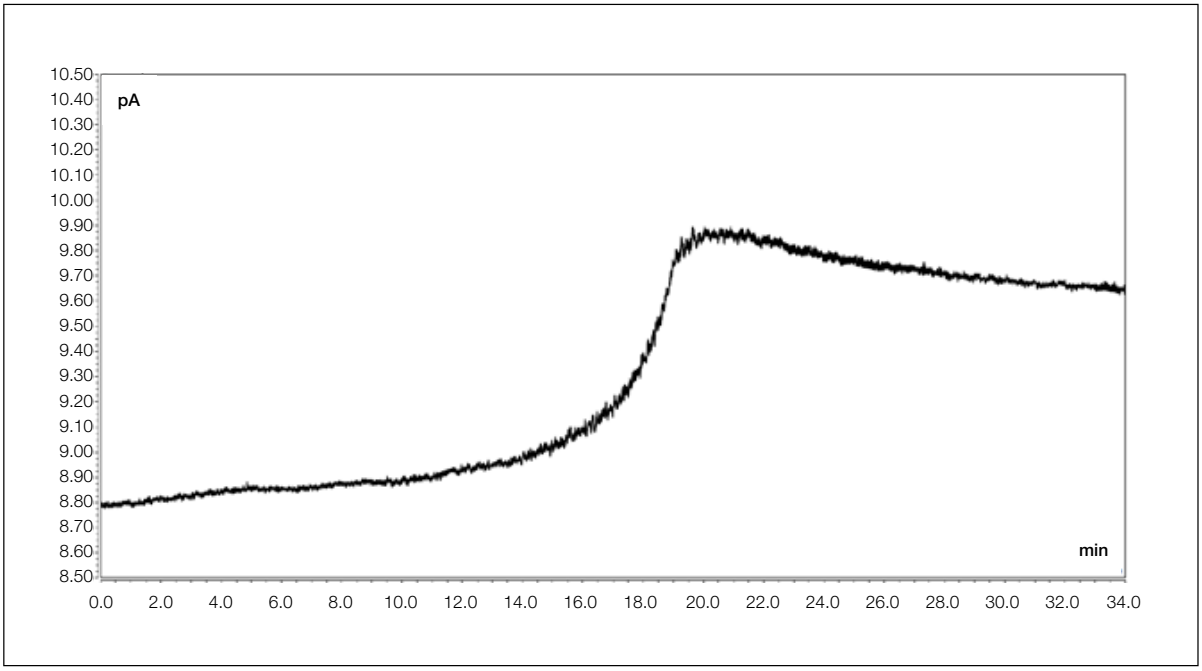


Figure 1. BP5MS GC column bleed performance.

Activity

Column activity is an important attribute of a high performance GC column. Limiting the active sites on the tubing (Silanol) means that reactive compounds can be chromatographed without loss in the column. The below table displays a test mix which has several probes for activity. The increasing tailing factor shows a larger activity. As can be seen the BP5MS and the market leader are almost identical in performance with the probes highlighted.

Test mix		BP5MS		Market leader	
Compounds	Functional test	Tailing factor	k'	Tailing factor	k'
1. 1-Propionic acid	Basicity	0.62	0.67	0.62	0.67
2. 1-Octene	Polarity	1.16	0.97	1.18	1.13
3. n-Octane	Hydrocarbon marker	1.18	1.06	1.22	1.17
4. 4-Picoline	Acidity	1.18	1.11	1.85	1.49
5. n-Nonane	Hydrocarbon marker	1.92	1.44	1.21	1.69
6. Trimethyl phosphate	Acidity	1.18	1.64	1.89	1.79
7. 1,2-Pentanediol	Silanol	1.21	1.83	1.13	1.86
8. n-Propylbenzene	Hydrocarbon marker	1.20	1.95	1.19	1.98
9. 1-Heptanol	Silanol	1.21	2.00	1.20	2.03
10. 3-Octanone	Polarity	1.22	2.11	1.20	2.13
11. n-Decane	Hydrocarbon marker	1.19	2.17	1.18	2.19

Selectivity

Our BP5MS column has been designed to provide the same selectivity as the market leading 5MS column. Figure 2 displays the peak retention times for an EPA 8270 test mix. Both column retention time data are plotted against each other allowing a visual indication of selectivity. The mathematical correlation of 0.9996 between the two columns demonstrates the selectivity is statistically the same.

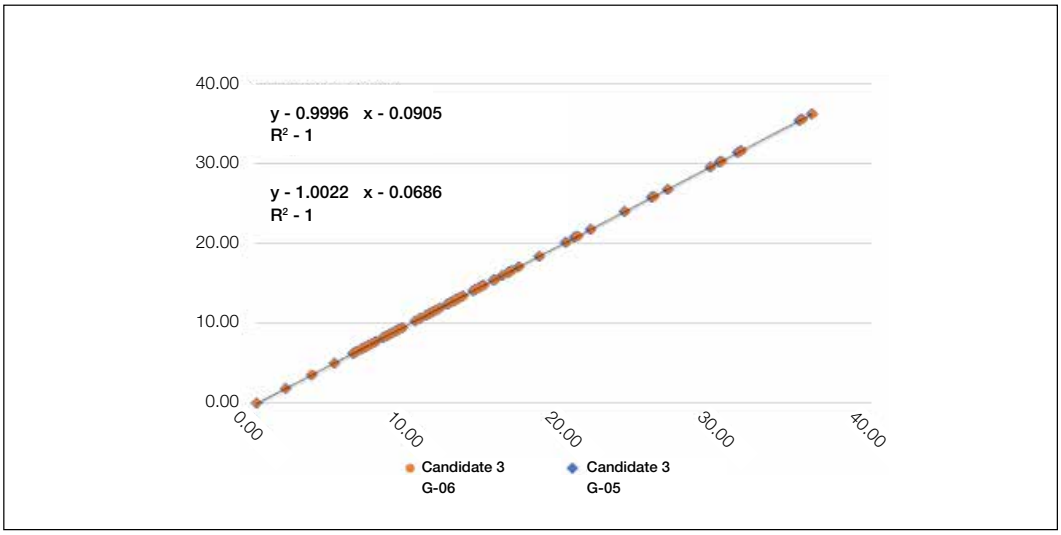


Figure 2. Selectivity of the BP5MS column compared to a market leading 5MS column.

Robustness

The robustness of the BP5MS GC column was determined by extracting 20 human serum samples (using the derivatization reagents methoxyamine hydrochloride and BSTFA+1% TMCS) and looking at the performance of specific compounds of interest to metabolomics.

- Lactic acid
- Alanine
- Valine
- Glyceric acid
- Fumaric acid
- Threonine
- Aspartic acid
- Pyroglutamic acid
- Proline
- Xylose
- Citric acid
- Glucose
- Sorbitol
- Ribose-5-phosphate
- Glucose-6-phosphate
- Cystine



Metabolite concentrations span many orders of magnitude for example glucose (mM) and glucose-6-phosphate (µM). All can be measured accurately within the CV< 25% peak area acceptable limit for biological-based analysis, as shown in figure 3 and 4.

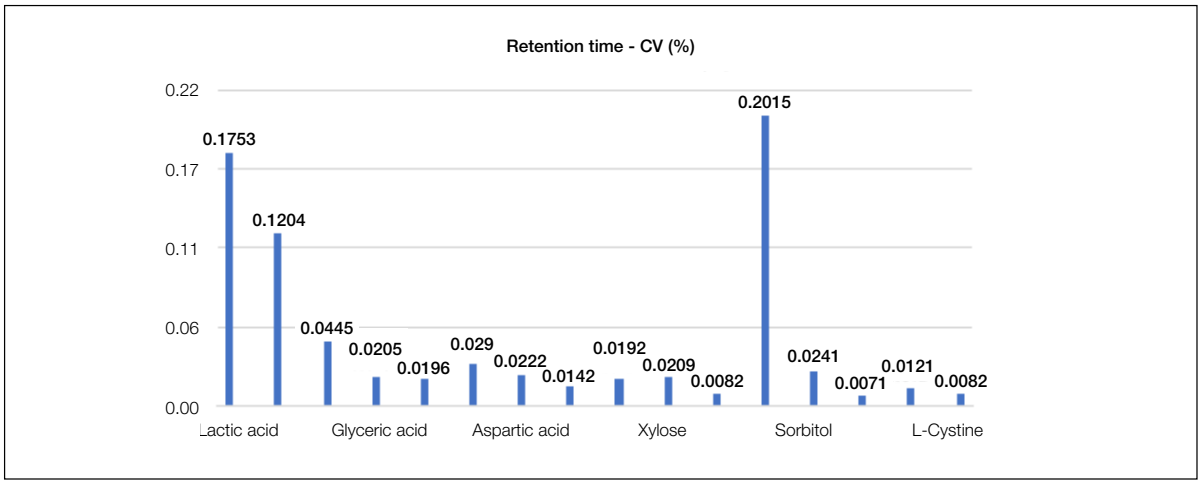


Figure 3. Retention time reproducibility CV (%) on early eluting metabolites (e.g. lactic acid) and on highly abundant metabolites (e.g. glucose).

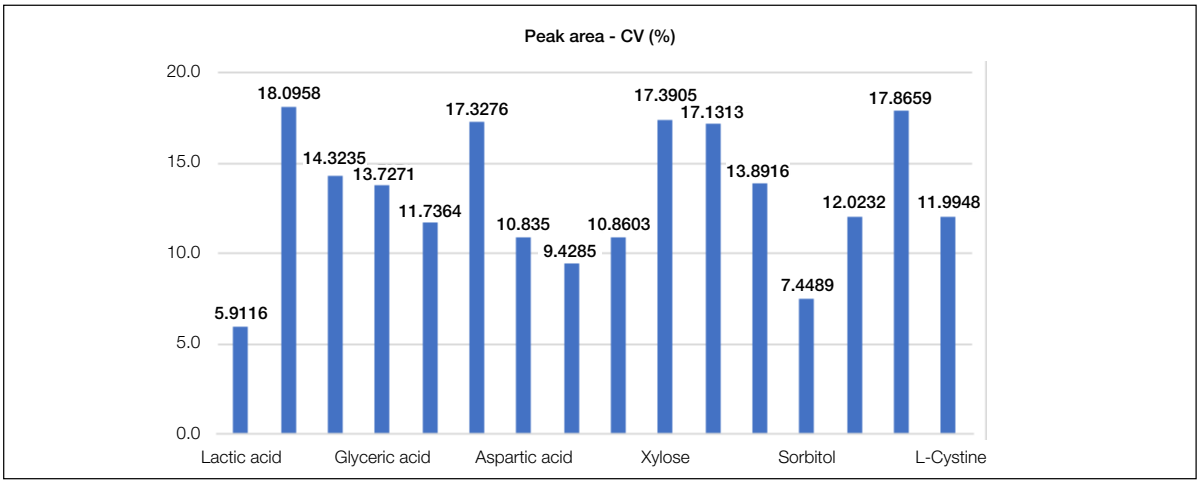


Figure 4. Peak area reproducibility CV (%) for 16 common metabolites – all are within the CV<25% acceptable limits for metabolomics analysis.

The same BP5MS GC column was run with 100 samples of the human serum. Figures 5, 6, 7 and 8 demonstrate the robustness of the GC column, showing the 100th sample result.

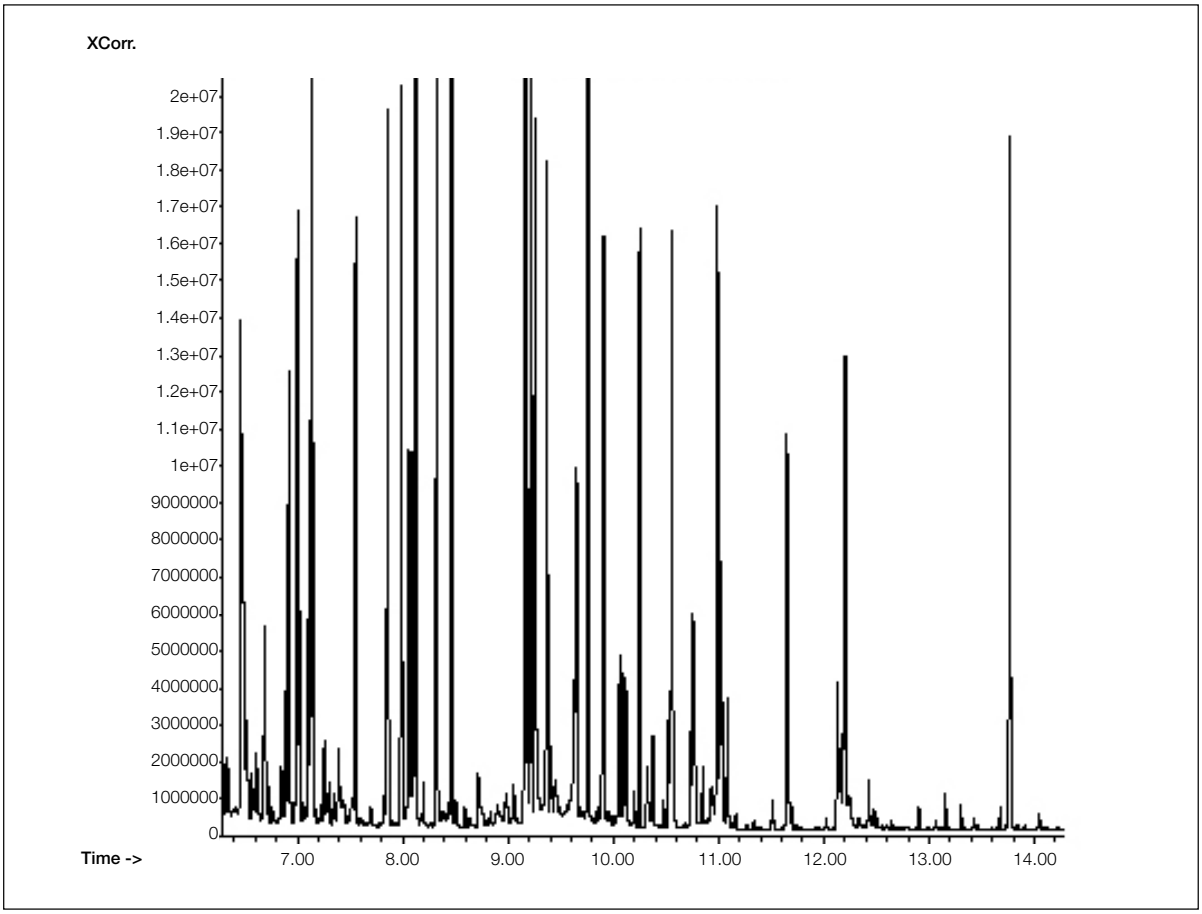


Figure 5. Example of the 100th human serum sample.

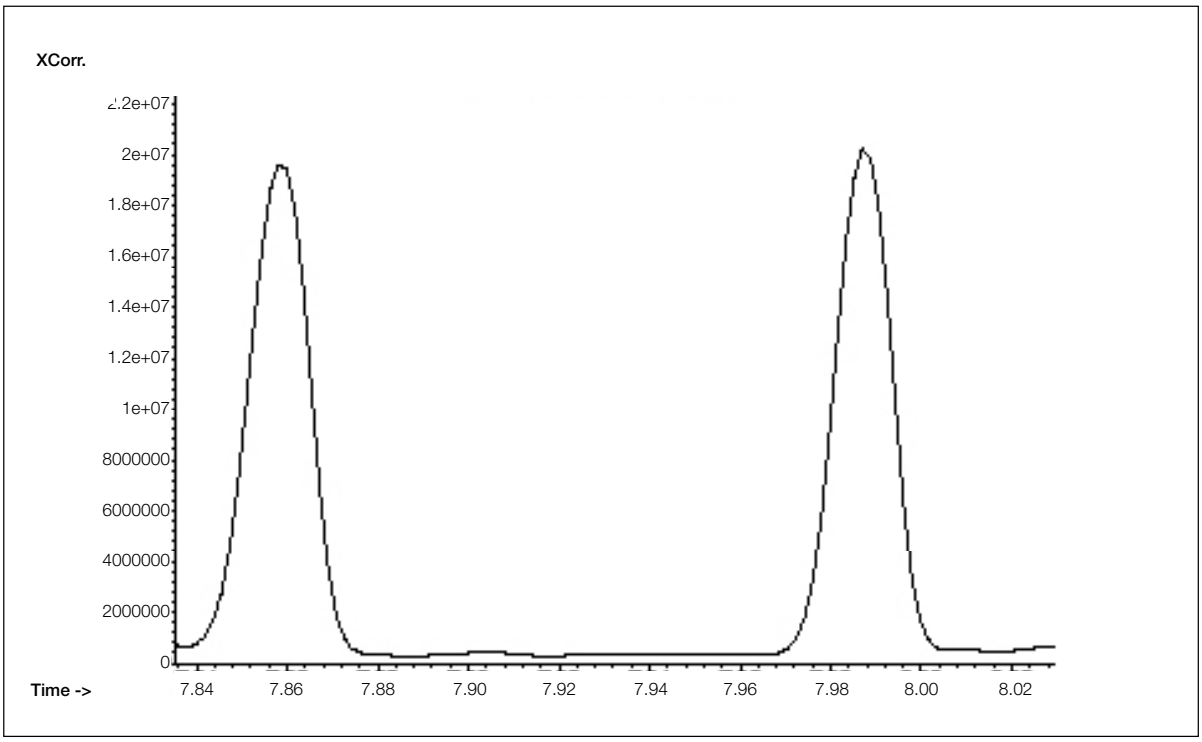


Figure 6. Separation of leucine/isoleucine in the 100th human serum sample.

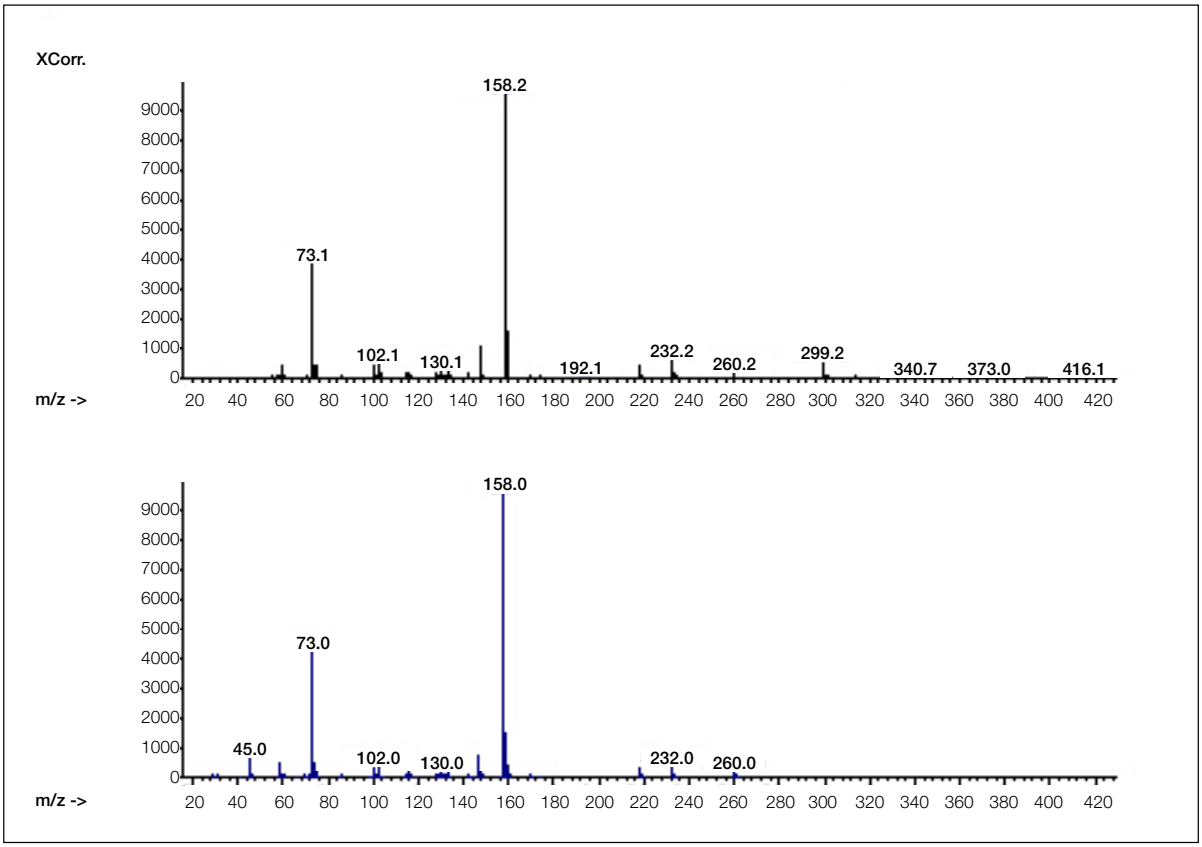


Figure 7. Identification of leucine in the 100th human serum sample against the NIST 17 library.

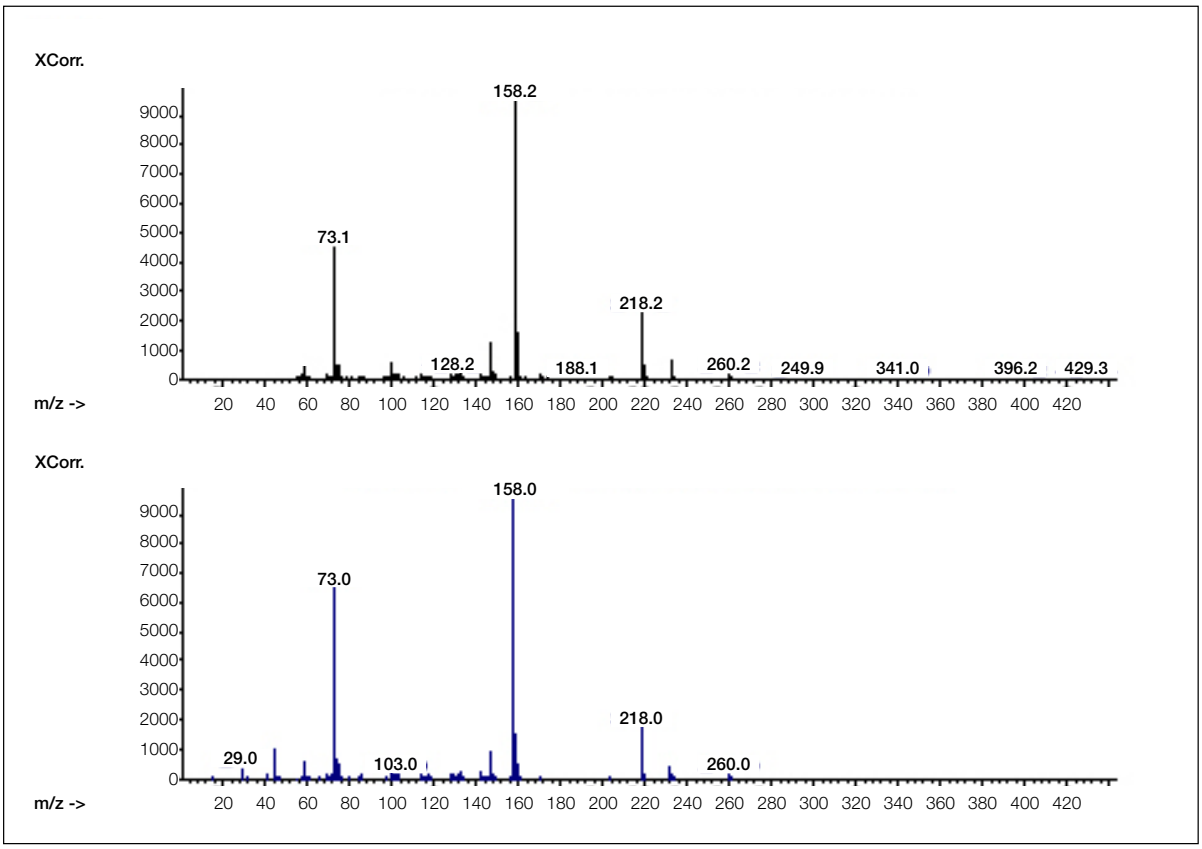


Figure 8. Identification of isoleucine in the 100th human serum sample against the NIST 17 library.

BP5MS column

Excellent performance for your MS analysis

The BP5MS GC column has been designed to provide excellent performance across a range of applications specific for your analysis.

Visit us at www.trajanscimed.com or contact your regional Trajan representative for assistance and further information.



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Trajan Scientific and Medical

Science that benefits people

Trajan is actively engaged in developing and delivering solutions that have a positive impact on human wellbeing. Our vision revolves around collaborative partnerships that improve workflows, delivering better results.