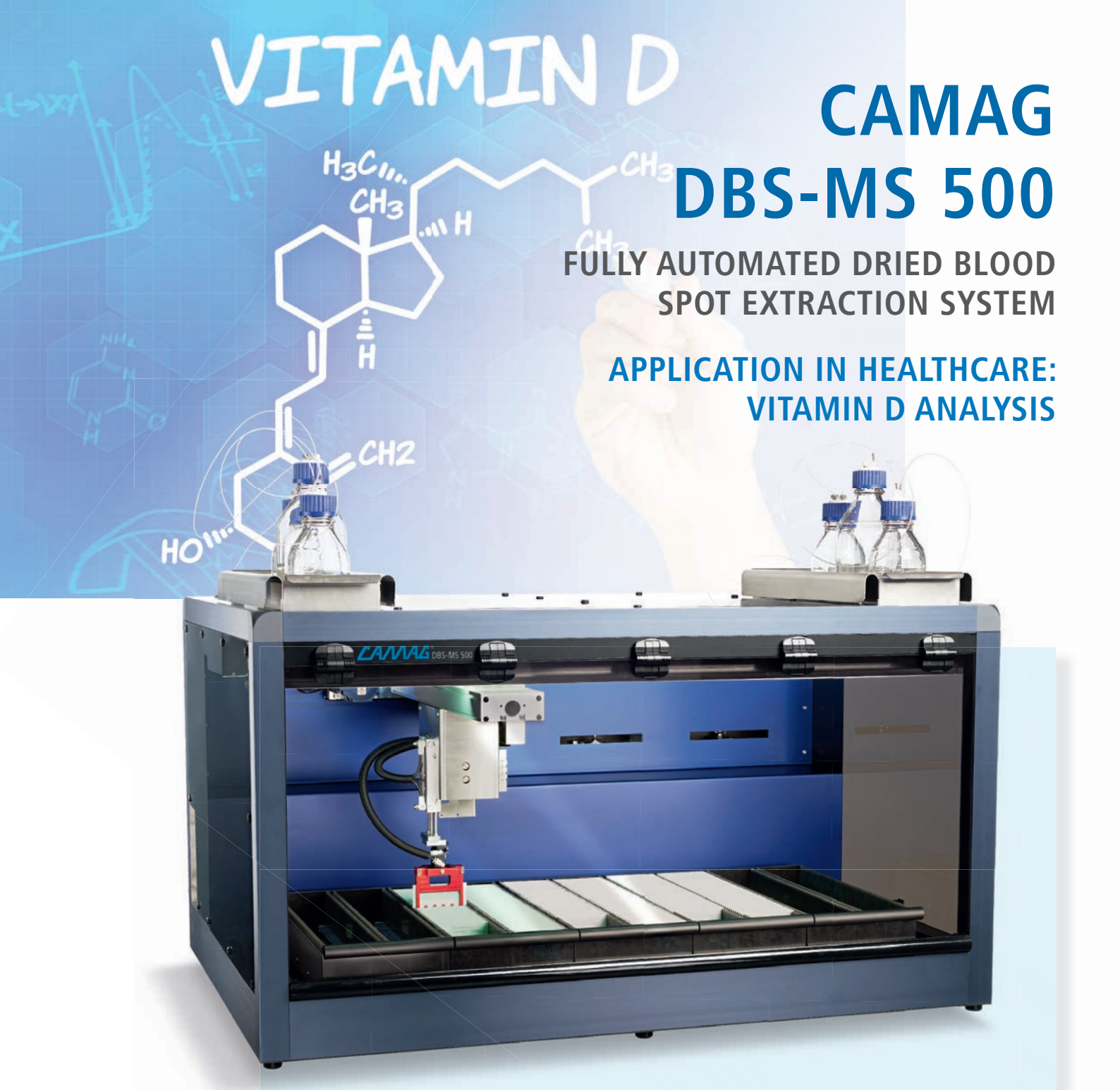
CAMAG
DBS-MS 500

FULLY AUTOMATED DRIED BLOOD SPOT EXTRACTION SYSTEM

APPLICATION IN HEALTHCARE: VITAMIN D ANALYSIS



- High throughput analysis of up to 500 DBS cards per run
- Integrated optical card recognition and barcode reading module
- Automated internal standard application module
- Unique extraction module with wash station to eliminate carry-over
- Online coupling to analysis system (LC-MS, MS or Sample Collector)
- Full control through Chronos software

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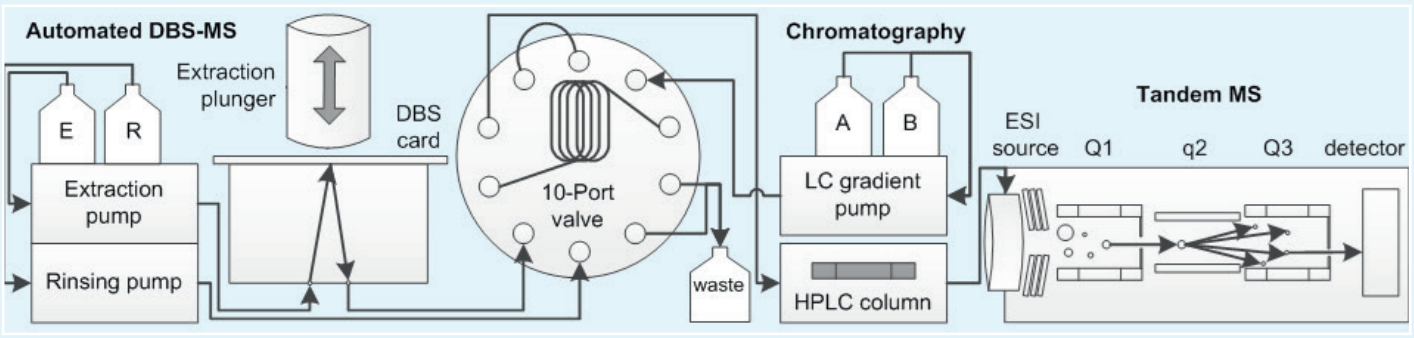
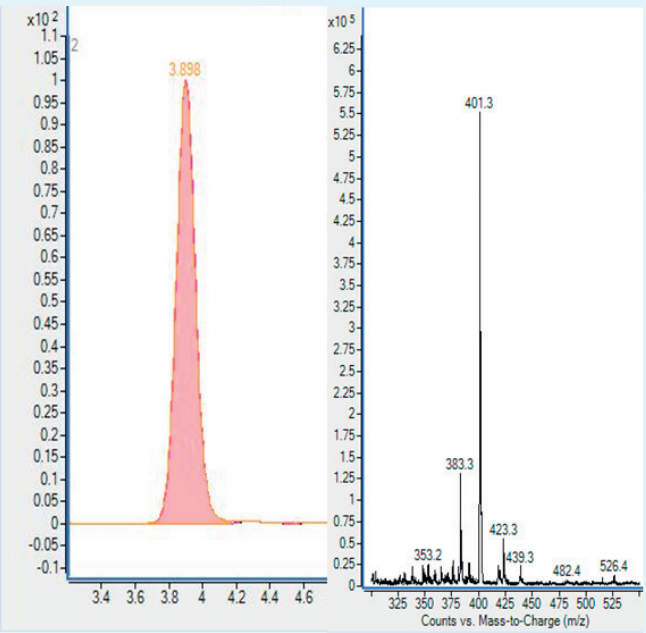
FULLY AUTOMATED DBS-LC-MS/MS METHOD FOR VITAMIN D ANALYSIS

Vitamin D_3 is the endogenously produced form of vitamin D. It is commonly known as the "sunshine vitamin", because it is converted from a precursor molecule (7-dehydrocholesterol) in the skin upon exposure to sunlight or UVB radiation. Vitamin D is essential for intestinal calcium absorption and plays an important role in maintaining calcium homeostasis and skeletal integrity. In addition, it also participates in the regulation of cell differentiation and proliferation, cellular growth, and hormone secretion. Therefore, an optimal vitamin D level is crucial for human health.

Simple methods for screening vitamin D deficiency are required in order to reduce the future diabetes and/or cardio metabolic risk among the population. Infants and adults should be tested for the risk of vitamin D deficiency, thus enabling an early enough vitamin D supplementation in case of insufficiency. A feasibility study for a fast and cost effective method has been investigated using dried blood spots (DBS). The flow scheme of the fully automated DBS-MS 500, which was coupled to a LC-MS/MS, is shown in the figure below.





An analysis method was developed for the simultaneous separation of 25-hydroxy vitamin D_3 and vitamin D_3 within five minutes. The limit of quantification (LOQ) of the approach was 15 ng/ml for 25-hydroxy vitamin D_3, which is the main biomarker for a person's vitamin D level. The method was successfully validated, hereby confirming the functioning of the technique. The evaluation of the method was continued in a small human study with 15 participants. A significant dependency of the vitamin D level and the individual sun exposure was observed. Moreover, 40% of the participants had a low or insufficient vitamin D level.

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