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A METHOD FOR QUANTIFICATION OF 25-HYDROXYVITAMIN D_3 USING TIME OF FLIGHT-SECONDARY ION MASS SPECTROMETRY AFTER DERIVATIZATION WITH A BETAINE ALDEHYDE

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25-hydroxyvitamin D (25-OHD) is known to be the best indicator of vitamin D status in the body. There are two major vitamin D metabolites in the circulation, 25-hydroxyvitamin D3 (25-OHD3) mainly derived from vitamin D3 produced by sunlight in the skin and 25-hydroxyvitamin D2 (25-OHD2) derived from plants in the diet. Severe vitamin D deficiency below 20 nmol/L causes rickets in children and osteomalacia in adults. Less severe deficiency, where the 25-OHD concentration is between 20 and 30 nmol/L, causes secondary hyperparathyroidism and increases in bone turnover and bone loss. Furthermore vitamin D insufficiency has been implicated in an extremely wide range of clinical disorders. Quantitative analysis of 25-hydroxyvitamin D, used as a bio marker for disease judgment, is a necessary process to find these risk factors. Here, we report the development of a precise and sensitive method to determine 25-hydroxyvitamin D (25-OHD3) using Time of Flight-Secondary Ion Mass Spectrometry (ToF-SIMS) after derivatization with a Betaine Aldehyde (BA). The method involves the use of deuterated [$2H_3$]-25-OHD3 as an internal standard compound for 25-OHD3. We conclude that this novel ToF-SIMS method would be useful for the evaluation of the vitamin D provide useful information in the diagnosis of vitamin D insufficiency/deficiency, as well as for the treatment and prevention of osteoporosis with vitamin D.

Biography

Jin Gyeong Son has completed her PhD in Analytical Chemistry from Korea Advanced Institute of Science and Technology and Postdoctoral studies from Korea Research Institute of Standard and Science. She has published more than 58 papers in reputed journals and has been serving as a Director of spin off Tx Biotechnology Enterprise.

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