The fine balance between vitamin D activation and catabolism

Deuterium enriched 4-(dimethylamino) benzoic acid N-hydroxysuccinimide (NHS) ester reagents (d0, d4, d6, d10) derivatize the primary amine group of lipids, such as PE lipid species. The subclasses of PE lipids (diacyl, ether, and plasmalogen) do not produce similar fragmentation patterns in positive ion mode or negative ion mode electrospray tandem mass spectrometry, which makes detection of PE subclasses within biological samples or complex mixtures difficult.

Specifically, tandem mass spectrometry most commonly detects PE subclasses by monitoring a neutral loss of 141 (NL141) amu, which is fragmentation associated with the loss of the PE headgroup. However, only diacyl and ether PE species undergo efficient fragmentation of the polar headgroup whereas plasmalogen PE species produce only a very minor ion resulting from the NL141 amu. The DMABA NHS ester reagents were developed by Dr. Robert Murphy’s laboratory at the University of Colorado (Denver, Co) in order to create PE derivatives where all subclasses and potentially oxidized products could be universally detected using a common precursor ion in the positive ion mode.1,2

References:
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