

Considerations in the selection of stable isotope labeled internal standards: Limitations of deuterated standards

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Stable isotope labeled standards are a critical component in quantification of metabolites and other compounds of interest by LC/MS/MS. Three stable isotopes are used to label reference standards-deuterium (^2H), carbon-13 (^{13}C), and nitrogen-15 (^{15}N). Of these isotopes, deuterium is most commonly used. It generally is the easiest to introduce into a molecule and is therefore the cheapest. However, deuterium suffers from inherent drawbacks that can limit the accuracy or viability in quantification by LC/MS/MS. These limitations include loss of deuterium in solution, loss of deuterium under mass spec conditions, deuterium isotope effects, changes in fragmentation and changes in HPLC retention time relative to the unlabeled compound of interest. Careful selection of sites to label with deuterium can minimize these effects. In addition, carbon-13 suffers from none of these deficiencies. This talk will focus the use of deuterium, strategies for selecting appropriate label location and the use of carbon-13 as an alternative to deuterium.

Biography

Scott W Landvatter earned his Ph.D. from the University of Illinois where he worked under Dr. John Katzenellenbogen. He joined SmithKline & French Labs in 1983 as a synthetic chemist specializing in isotope labeling chemistry. He has published more than 50 papers dealing with isotopically labeled compounds. Following the merger of SmithKline Beecham with Glaxo, he left to found IsoSciences in 2002. IsoSciences has since grown to become a recognized world leader in innovative preparation of stable isotope labeled compounds and standards. The company has developed an extensive catalog of stable isotope labeled standards as well as performing custom syntheses.

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