Tables

Table 1: Overview of (A) classical derivatization agents suitable for HPLC, UPLC and LC-MS as well as (B) derivatization agents exclusively developed for use in LC-MS measurements.

(A) "Classical" derivatization agents		
Agent	**Specification**	**Reference**
Ninhydrin	*Ruhemann's purple,* 2,2-dihydroxyindane-1,3-dione	Ruhemann, 1910; Consden et al., 1944; Stein & Moore, 1948; Moore & Stein, 1948
PITC	*Edman's reagent,* phenylisothiocyanate & other isothiocyanates	Edman, 1950; Sherwood et al., 1990; Santa, 2010; Heinriksen & Meredith, 1984; Rydberg et al., 2009
Dabsyl Cl	4-(4-Dimethylaminophenylazo)benzene sulfonyl chloride	Krause et al., 1985; Inoue et al., 2003
Dansyl Cl	5-dimethylamino-1-naphthalenesulfonyl chloride	Maquez et al., 1986; Kang et al., 2006; Baghdady & Schug, 2015
FMOC	9-fluorenylmethyl chloroformate	Bank et al., 1996; Uutela et al., 2009
AQC	6-aminoquinolyl-N-hydrosysuccinimidyl carbamate	Shindo et al., 1997; Badiou et al., 2004; Booger et al., 2008; Salazar et al., 2011
OPA	*o*-phtalaldehyde	Zimmermann, 1930; Klein & Linser, 1932; Zuman, 2004; Alvarez-Coque et al., 1989; Mengerink et al., 2002
(B) Derivatization agents for LC-MS		
Agent	**Specification**	**Reference**
iTRAQ®	isobaric Tags for Relative and Absolute Quantitation, an amine-reactive isobaric tagging agent used in the tagging of peptides and amino acids, two reagents in use: 4-plex and 8-plex, both differ in their fragmentation pattern; only commercial derivatization kit forproteins	Kaspar et al., 2009; Feng, 2011
EASC	10-ethyl-acridone-3-sulfonyl chloride for sensitive UHPLC-MS/MS detection of amino acids with a good chromatographic resolution	Zhao et al., 2015
SPTPP	(5-N-succinimidoxy-5-oxopentyl)triphenyl-phosphonium bromide for the formation of strongproduct ions	Grecoa et al., 2013; Inagaki et al., 2010
TAHS	(p-N,N,N-trimethylammonioanilyl N'-hydroxy-succinimidyl carbamate iodide and its deuterated analogue TAHS-d3 as activated carbamates for sensitive amino acid detection and selected cleavage of the derivatives	Shimbo et al., 2009; Karakawa et al., 2010
APDS	3-aminopyridyl-N-hydroxysuccinimidyl carbamate, synthesized for high-speed analysis in biological fluids	Shimbo et al., 2009b

Table 2. Strategies to reduce matrix effects during LC-MS measurements.

Matrix effects: modus operandi*	
Specification	**Reference**
common use of internal, stable isotope standards that are similarly influenced by matrix effects	Nemkov et al., 2015; Van Eeckhaut et al., 2009; Armstrong et al., 2007
standards addition (non-isotope)	Ghassabian et al., 2014
application of multiple lots of biofluids for calibration and assay validation	Matuszewski et al., 2003
clean-up procedures such as solid phase (SPE) or other extractions techniques	How et al., 2014; Cappiello et al., 2008; Armstrong et al., 2007
derivatization (to some extent)	
MS ionization: APCI instead of ESI	Van Eeckhaut et al., 2009; Truffelli et al., 2011; Cappiello et al., 2008
direct electron / electron (impact) ionization	Capiello et al., 2008
use of charged microdroplets	Kulyk et al., 2015

*for review see also : Van Eeckhaut et al,. 2009; Antignac et al., 2005; Matuszewski et al., 2003