

ACROLEIN, CROTONALDEHYDE, AND ARECOLINE

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Table S1.2 Representative methods for the analysis of acrolein biomarkers and metabolites

Metabolite	Sample matrix	Assay procedure	Reference
Protein adducts	Rat serum	ELISA	Li et al. (2004)
Lysine adducts	Peptides in vitro	TIMS ESI-QqTOF	Gomez et al. (2018)
DNA adducts	Rat liver DNA samples	³² P-Postlabelling/SPE-HPLC/UV	Pan et al. (2006)
DNA adducts	Rat and human DNA samples	LC equipped with 2D linear quadrupole ion trap MS	Bessette et al. (2009)
Exocyclic DNA adducts	Human placental samples	LC-MS	Chen (2011)
DNA adducts	Human leukocyte DNA from smokers and non-smokers	LC-ESI-MS/MS	Zhang et al. (2011)
DNA adducts, HPMA	Buccal cells and urine	Western blot analysis, HPLC-MS/MS	Tsou et al. (2019)
HPMA	Human urine	LC-APCI-MS/MS-SRM	Carmella et al. (2007)
HPMA	Human urine samples	HILIC-ESI-MS/MS	Eckert et al. (2010)
HPMA, CEMA	Urine of tobacco smokers	UPLC-ESI-MS/MS	Alwis et al. (2015)
HPMA	Human urine samples	High-throughput multiplex-LC-MS/MS	Pluym et al. (2015)
HPMA	Human urine samples	Immunostaining ELISA Western blotting LC-MS/MS GC-MS	Higashi et al. (2016)
HPMA, CEMA	Human urine samples	UPLC-MS/MS	Keith et al. (2018)
HPMA	Mouse urine	UPLC-MS/MS	Conklin et al. (2017)
HPMA, CEMA	Human urine	LC-MS/MS	Ruenz et al. (2019)

APCI, atmospheric pressure chemical ionization; CE, capillary electrophoresis; CEMA, *N*-acetyl-S-(2-carboxyethyl)-L-cysteine; DAD, diode array detector; ELISA, enzyme-linked immunosorbent assay; FD, fluorescence detection; FTIR, Fourier transform infrared spectroscopy; GC, gas chromatography; HILIC, hydrophilic interaction chromatography; HPLC, high-performance liquid chromatography; HPMA, *N*-acetyl-S-(3-hydroxypropyl)-L-cysteine; LC, liquid chromatography; MLC, micellar liquid chromatography; MS-MS, tandem mass spectrometry; NIR, near infrared spectroscopy; NMR, nuclear magnetic resonance spectroscopy; NPD, nitrogen-phosphorous detector; SERS, surface-enhanced Raman spectroscopy; SRM, selected reaction monitoring; TIMS ESI-QqTOF, trapped ion mobility spectrometry electrospray ionization-quadrupole-quadrupole-time-of-flight; UPLC, ultra-performance liquid chromatography; UV, ultraviolet; VIS, visual detection.

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