

Global list of validated analytes available at ABF (in alphabetic order)

Analyte (abbreviation)	Chemical name	Chemical class / Function of the marker	Analytical technique	Matrix	ABF Method No
11-dh-TXB₂	11-dehydro-thromboxane B ₂	Eicosanoid (inflammation)	LC-MS/MS	U	034
12-HETE	12-hydroxyeicosa-tetraenoic acid	Eicosanoid (inflammation)	LC-MS/MS	U	034
1-MHBMA	1-Hydroxybutene-2-yl mercapturic acid	Mercapturic acid (exposure to 1,3-butadiene)	LC-MS/MS	U	038
1-OH-Nap	1-OH-Naphthalene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
1-OH-Phe	1-OH-Phenanthrene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
1-OH-Pyr	1-OH-Pyrene	Polycyclic aromatic hydrocarbon (PAH)	LC-MS/MS	U	029
2,3-dn-8-iso-PGF2α	2,3-dinor-8-epi/iso-prostaglandin F2 alpha	Eicosanoid (ox. stress)	LC-MS/MS	U	034
2,3-dn-TXB₂	2,3-dinor-thromboxane B ₂	Eicosanoid (inflammation)	LC-MS/MS	U	034
2-AN	2-Aminonaphthalene	Aromatic amine	GC-MS	U	020
2-AN	2-Aminonaphthalene	ETS marker	GC-MS	ETS	223
2-HPMA	2-Hydroxypropyl-mercapturic acid	Mercapturic acid (exposure to propylene oxide)	LC-MS/MS	U	038
2-MHBMA	2-Hydroxybutene-1-yl mercapturic acid	Mercapturic acid (exposure to 1,3-butadiene)	LC-MS/MS	U	038
2-OH-Flu	2-OH-Fluorene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
2-OH-Nap	2-OH-Naphthalene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
2-OH-Phe	2-OH-Phenanthrene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
3-ABP	3-Aminobiphenyl	Aromatic amine	GC-MS	U	020
3-EP	3-Ethenylpyridine	ETS marker	GC-MS	ETS	210
3-HPMA	3-Hydroxypropyl-mercapturic acid	Mercapturic acid (exposure to acrolein)	LC-MS/MS	U	038
3-OH-Butyrate	3-OH-Butyrate	Ketone bodies	GC-MS	P, S, brain	043
3-OH-Phe	3-OH-Phenanthrene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
4-ABP	4-Aminobiphenyl	Aromatic amine	GC-MS	U	020
4-ABP	4-Aminobiphenyl	ETS marker	GC-MS	ETS	223
4-ABP-Hb adducts	Hemoglobin adducts of 4-aminobiphenyl	Aromatic amine (long-term exposure marker for 4-ABP)	GC-MS	B	027
4-HNE	4-hydroxy-2-nonenal	Aldehyde (lipid peroxidation)	GC-MS	U, EBC	202
4-OH-Phe	4-OH-Phenanthrene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
5-FU	5-Fluorouracil	Cytostatic drug	LC-MS/MS	W	031
8-iso-PGF2α	8-epi/iso-prostaglandin-F2 alpha	Eicosanoid (ox. stress)	LC-MS/MS	U	034

8-OHdG	8-hydroxy-2-deoxy-guanosine	Oxidized derivative of deoxyguanosine	LC-MS/MS	U	009
9-OH-Phe	9-OH-Phenanthrene	Polycyclic aromatic hydrocarbon	LC-MS/MS	U	029
AA	Acetaldehyde	ETS marker	HPLC-UV	ETS	218
AAMA	N-Acetyl-S-(2-carbamoylethyl)-l-cysteine	Mercapturic acid (exposure to acrylamide)	LC-MS/MS	U	038
AAVal	Carbamoylethyl-valine	Hemoglobine adducts (exposure to acrylamide)	GC-MS	B	017
Acetoacetate	Acetoacetate	Ketone bodies	GC-MS	P, S, brain	043
Acetone	Acetone	Ketone bodies	GC-MS	P, S, brain	043
ACN	Acetonitrile		GC-MS	B,P,S	022
Acrolein	Acrolein	ETS marker	HPLC-UV	ETS	218
ADMA	Asymmetric Dimethyl-arginine	Amino acid (ox. stress, inflammation, NO imbalance)	LC-MS/MS	P	032
AMCC	N-acetyl-S-(N-methylcarbamoyl)cysteine	Mercapturic acid (exposure to dimethylformamide)	LC-MS/MS	U	038
Arg	Arginine	Amino acid	LC-MS/MS	P	032
BaP	Benzo[a]pyrene	ETS marker	GC-MS	ETS	222
Ben	Benzene	ETS marker	GC-MS	ETS	220
Benzene (BTX)	Benzene		GC-MS	B,EB	205
Benzole, Toluol, Xylenes(o, m, p)	Benzene		GC-MS	B,EB	205
But	1,3-Butadiene	ETS marker	GC-MS	ETS	219
CA	Cholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
CDCA	Chenodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
CEMA	Cyanoethyl-mercaptopuric acid	Mercapturic acid (exposure to acrylonitrile)	LC-MS/MS	U	037
CEVal	N-2-Cyanoethyl-valine	Hemoglobine adducts (exposure to acrylonitrile)	GC-MS	B	017
Cit	Citrulline	Amino acid	LC-MS/MS	P	032
CMEMA	2-Carboxy-1-ethylethyl-mercaptopuric acid	Mercapturic acid (exposure to crotonaldehyde)	LC-MS/MS	U	037
CO	Carbon monoxide	ETS marker	IR	ETS	215
CO₂	Carbon dioxide	ETS marker	IR	ETS	216
COex	Carbon monoxide in exhaled breath	Carbonmonoxide (exposure to CO)	ECD	EB	207
COHb	Carboxyhemoglobin	Carbonmonoxide (exposure to CO)	Photometry	B	206
Cot	Cotinine	Nic-metabolite	LC-MS/MS	Sa	013
Cot	Cotinine	Nic-metabolite	LC-MS/MS	P, S	019
Cot	Cotinine	Nic-metabolite	LC-MS/MS	F	033
Cot	Cotinine	Nic-metabolite	LC-MS/MS	U,P,S, Sa	036
Cot-Gluc	Cotinine-glucuronide	Nic-metabolite	LC-MS/MS	F	033
Cot-Gluc	Cotinine-glucuronide	Nic-metabolite	LC-MS/MS	U	036
Cot-N-Ox	Cotinine-N-oxid	Nic-metabolite	LC-MS/MS	F	033
Cot-N-Ox	Cotinine-N-oxid	Nic-metabolite	LC-MS/MS	U	036
CP	Cyclophosphamide	Cytostatic drug	LC-MS/MS	W	031

CREA	Creatinine	Normalization of urinary concentrations	Photometry	U	011
CRO	Crotonaldehyde	ETS marker	HPLC-UV	ETS	218
DCA	Deoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
DHBMA	Dihydroxybutyl-mercapturic acid	Mercapturic acid (exposure to 1,3-butadiene)	LC-MS/MS	U	038
DHNMA	1,4-Dihydroxy-2-nonenemercapturic acid	Mercapturic acid (Ox. Stess, lipid peroxidation)	LC-MS/MS	U	024
Doce	Docetaxel	Cytostatic drug	LC-MS/MS	W	031
eAde	1,N ⁶ -Etheno-adenine	Urinary DNA Adduct ((Ox. Stess, lipid peroxidation)	LC-MS/MS	U	025
eCyt	3,N ⁴ -Etheno-cytosine	Urinary DNA Adduct (Ox. Stess, lipid peroxidation)	LC-MS/MS	U	025
EMA	Ethyl-mercapturic acid	Mercapturic acid (exposure to ethylating agents)	LC-MS/MS	U	037
Epi	Epirubicin	Cytostatic drug	LC-MS/MS	U,W	225
EtAde	3-Ethyl-adenine	Urinary DNA Adduct (exposure to ethylating agent)	LC-MS/MS	U	004
Ethylbenzene	-	ETS marker	GC-MS	ETS	220
FA	Formaldehyde	ETS marker	HPLC-UV	ETS	218
F-PM	-	ETS marker	Fluorimetry	ETS	214
GAMA	N-(R,S)-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-l-cystein	Mercapturic acid (exposure to acrylamide)	LC-MS/MS	U	038
GCA	Glycocholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
GCDC	Glycochenodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
GDCA	Glycodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
Gem	Gemcitabin	Cytostatic drug	LC-MS/MS	W	031
GHDC	Glycohyodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
GLCA	Glycolithocholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
Glycerol	Glycerol	Excipient (for e-cigarettes)	GC-MS	U,P,S,Sa	204
GUDC	Glycoursodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
Hcy	Homo-cysteine	Amino acid (CVD risk factor)	LC-MS/MS	P	032
HDCA	Hyodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
HEMA	2-Hydroxy-ethyl-mercapturic acid	Mercapturic acid (exposure to ethylene oxide)	LC-MS/MS	U	037
HMPMA	3-Hydroxy-1-methylpropyl-mercapturic acid	Mercapturic acid (exposure to crotonaldehyde)	LC-MS/MS	U	037
HNALMA	4-Hydroxy-2-nonenelactone mercapturic acid	Mercapturic acid (Ox. Stess, lipid peroxidation)	LC-MS/MS	U	024
HNAMA	4-Hydroxy-2-nonene mercapturic acid	Mercapturic acid (Ox. Stess, lipid peroxidation)	LC-MS/MS	U	024

HNE-MA	4-Hydroxy-2-nonenal mercapturic acid	Mercapturic acid (Ox. Stess, lipid peroxidation)	LC-MS/MS	U	024
HOEtVal	N-2-Hydroxyethyl-valine	Hemoglobine adducts (exposure to ethylene oxide)	GC-MS	B	017
HPB	4-hydroxy-1-(3-pyridyl)-1-butanone	DNA adduct to NNK, NNN exposure	LC-MS/MS	DNA containing matrix	044
HyPyBut	4-hydroxy-(3-pyridyl) butanoic acid	Nic-metabolite	LC-MS/MS	U	036
IF	Ifosfamide	Cytostatic drug	LC-MS/MS	W	031
LCA	Lithocholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
L-NMMA	L-N-Monomethyl-arginine	Amino acid (ox. stress, inflammation, NO imbalance)	LC-MS/MS	P	032
LTE₄	Leukotriene E ₄	Eicosanoid (inflammation)	LC-MS/MS	U	034
MDA	Malondialdehyde	Aldehyde (lipid peroxidation)	GC-MS	U, EBC	202
MeAde	3-Methyl-adenine	Urinary DNA Adduct (exposure to methylating agents)	LC-MS/MS	U	004
Menthol MI metabolite	<i>p</i> -menthane-3,8-diol	Menthol metabolite	LC-MS/MS	P, S	041
Met	Methionine	Amino acid	LC-MS/MS	P	032
Metabolomics	Untargeted Metabolomics profiling	Identification of new biomarkers (for effect and exposure)	GC-TOF-MS	U,P, S,Sa	224
MeVal	N-Methyl-valine	Hemoglobine adducts (exposure to methylating agents)	GC-MS	B	017
MMA	Methyl-mercapturic acid	Mercapturic acid (exposure to methylating agents)	LC-MS/MS	U	037
MTCA	2-Methylthiazolidine-4-carboxylic acid	Urinary Cysteinylglycine Adduct (exposure to acetaldehyde)	LC-MS/MS	U	209
MTCG	2-Methylthiazolidine-4-carbonyl-glycine	Urinary Cysteinylglycine Adduct (exposure to acetaldehyde)	LC-MS/MS	U	209
MTX	Methotrexat	Cytostatic drug	LC-MS/MS	W	031
NAB	N-Nitroso-anabasine	Tobacco specific nitrosamine (TSNA)	LC-MS/MS	U	023
NAT	N-Nitroso-anatabine	Tobacco specific nitrosamine (TSNA)	LC-MS/MS	U	023
Nic	Nicotine	-	LC-MS/MS	Sa	013
Nic	Nicotine	-	LC-MS/MS	P,S	019
Nic	Nicotine	-	LC-MS/MS	F	033
Nic	Nicotine	-	LC-MS/MS	U	036
Nic	Nicotine	ETS marker	GC-MS	ETS	210
Nic-Gluc	Nicotine-glucuronide	Nic-metabolite	LC-MS/MS	F	033
Nic-Gluc	Nicotine-glucuronide	Nic-metabolite	LC-MS/MS	U	036
Nic-N-Ox	Nicotine-N-oxid	Nic-metabolite	LC-MS/MS	F	033

Nic-N-Ox	Nicotine- <i>N</i> -oxid	Nic-metabolite	LC-MS/MS	U	036
NNAL	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol	Tobacco specific nitrosamine (TSNA)	LC-MS/MS	U	023
NNAL-Gluc	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol-glucuronide	Tobacco specific nitrosamine (TSNA)	LC-MS/MS	U	023
NNK	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone	ETS marker	LC-MS/MS	ETS	221
NNN	N-Nitroso-nornicotine	Tobacco specific nitrosamine (TSNA)	LC-MS/MS	U, ETS	023
NNN	Nornicotine	ETS marker	LC-MS/MS	ETS	221
NO	Nitrogen oxide	ETS marker	Chemo-luminescence	ETS	217
NO₂	Nitrite	Nitric oxide	Photometry	EBC	208
NO₂	Nitrogen dioxide	ETS marker	Chemo-luminescence	ETS	217
NO₃	Nitrate	Nitric oxide	Photometry	EBC	208
NorCot	Norcotinine	Nic-metabolite	LC-MS/MS	F	033
NorCot	Norcotinine	Nic-metabolite	LC-MS/MS	F	033
NorCot	Norcotinine	Nic-metabolite	LC-MS/MS	U	036
NorNic	Nornicotine	Nic-metabolite	LC-MS/MS	U	036
Ntyr	3-Nitro-tyrosine	Amino acid (ox. stress)	LC-MS/MS	EBC	032
o-/m-/p-/Xylene	-	ETS marker	GC-MS	ETS	220
OH-Cot	<i>trans</i> -3'-hydroxy-cotinine	Nic-metabolite	LC-MS/MS	Sa	013
OH-Cot	<i>trans</i> -3'-hydroxy-cotinine	Nic-metabolite	LC-MS/MS	F	033
OH-Cot	<i>trans</i> -3'-hydroxy-cotinine	Nic-metabolite	LC-MS/MS	U	036
OH-Cot-Gluc	3-Hydroxy-cotinine-glucuronide	Nic-metabolite	LC-MS/MS	F	033
OH-Cot-Gluc	3-Hydroxy-cotinine-glucuronide	Nic-metabolite	LC-MS/MS	U	036
o-Tol	o-Toluidine	Aromatic amine	GC-MS	U	020
o-TOL	o-Toluidine	ETS marker	GC-MS	ETS	223
PA	Propionaldehyde	ETS marker	HPLC-UV	ETS	218
Pacli	Paclitaxel	Cytostatic drug	LC-MS/MS	W	031
Particulate matter (PM)	-	ETS marker	Light scattering or gravimetry	ETS	211
PC	Phosphatidylcholine	Lipid (lipid metabolism)	LC-MS/MS	P,S	203
PE	Phosphatidyl-ethanolamine	Lipid (lipid metabolism)	LC-MS/MS	P,S	203
PGD-M	tetranor-PGD metabolite	Eicosanoid (inflammation)	LC-MS/MS	U	034
PGE-M	tetranor-PGE metabolite	Eicosanoid (inflammation)	LC-MS/MS	U	034
PGF2α	prostaglandin F2 alpha	Eicosanoid (ox. stress)	LC-MS/MS	U	034
PHE	Phenanthrene	ETS marker	GC-MS	ETS	222
PHEMA-1	2-hydroxy-1-phenylethyl mercapturic acid	Mercapturic acid (exposure to styrene)	LC-MS/MS	U	037
PHEMA-2	2-hydroxy-2-phenylethyl mercapturic acid	Mercapturic acid (exposure to styrene)	LC-MS/MS	U	037
Propylene glycol	Propylene glycol	Excipient (for e-cigarettes)	GC-MS	U,P,S, Sa	204
PYR	Pyrene	ETS marker	GC-MS	ETS	222
SBMA	S-Benzyl-mercapturic acid	Mercapturic acid (exposure to toluene)	LC-MS/MS	U	037

SCN	Thiocyanate	Exposure to hydrogen cyanide (and other cyanides)	GC-MS	U	012
SDMA	Symmetric Dimethyl-arginine	Amino acid (ox. stress, inflammation, NO imbalance)	LC-MS/MS	P	032
Solanesol	Solanesol	ETS marker	HPLC-UV	ETS	212
SPMA	S-Phenyl-mercapturic acid	Mercapturic acid (exposure to benzene)	LC-MS/MS	U	037
β-Carotene	beta-Carotene	Vitamine (ox. stress)	HPLC-UV	P,S	201
TCA	Taurocholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
TCA	Thiazolidine-4-carboxylic acid	Urinary Cysteinylglycine Adduct (exposure to formaldehyde)	LC-MS/MS	U	209
TCDC	Taurochenodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
TCG	Thiazolidine-4-carboxyl-glycine	Urinary Cysteinylglycine Adduct (exposure to formaldehyde)	LC-MS/MS	U	209
TDCA	Taurodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
THDCA	Taurohyodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
Thioether	Thioether	Exposure to electrophilic compounds	Photometry	U	008
TLCA	Tauroolithocholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
Toluene	-	ETS marker	GC-MS	ETS	220
<i>tt</i>-MA	<i>trans,trans</i> -muconic acid		GC-MS	U	001
TUDCA	Tauroursodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
UDCA	Ursodeoxycholic acid	Lipid (lipid absorption)	LC-MS/MS	P,S,U	039
UV-PM	-	ETS marker	Photometry	ETS	213
Vit C	Ascorbic acid	Vitamine (ox. stress)	HPLC-UV	P,S	201
Vit E	alpha-Tocopherol	Vitamine (ox. stress)	HPLC-UV	P,S	201

Abbreviations:

B: Blood, EB: Exhaled breath, EBC: Exhaled breath condensate, ETS: Environmental tobacco smoke, F: Feces, GC: Gas chromatography, HPLC-UV: High performance liquid chromatography with photospectrometry, LC: Liquid chromatography, MS: Mass spectrometry, MS/MS: Tandem mass spectrometry, P: Plasma, S: Serum, Sa: Saliva, TOF: Time of flight (mass spectrometry), U: Urine, W: Swipe sample