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From the air to the water phase: Implication for toxicity testing of combustion derived particles

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Supplement Material

Table S1 Summary of the used bioassays within the 81 publications. The main effect detection categories “ecotoxicity”, “cytotoxicity”, “cell viability”, “mutagenicity/ genotoxicity” and “oxidative stress” with the corresponding Bioassays were listed.

	Assay	Organism	Cell line	Exposure duration	Effect	Literature
Ecotoxicity	Algae Growth Inhibition Assay	<i>Selenastrum capricornutum</i>	-	96 h	Chlorophyll content, Growth inhibition	[67]
	Algaltokit F™	<i>Selenastrum capricornutum</i>	-	72 h	Growth inhibition	[23]
	Artoxkit M™	<i>Artemia franciscana</i>	-	24 h	Immobilisation	[23]
	Bacterial Contact Test	<i>Arthrobacter globiformis</i>	-	2 h	Bacterial cytotoxicity	[7]
	Bioluminescent Bacteria Test	<i>Photobacterium phosphoreum</i> T3 (PPT3); <i>Vibrio fischeri</i>	-	30 min	Bacterial cytotoxicity	[12, 13, 14, 23, 65, 66, 88, 91]
	Daphnia Acute Immobilisation Assay	<i>Ceriodaphnia dubia</i>	-	48 h	Immobilisation	[67]
	Daphtoxkit Fmagna™	<i>Daphnia magna</i>	-	48 h	Immobilisation	[23]

	Assay	Organism	Cell line	Exposure duration	Effect	Literature
Ecotoxicity	Marine Algaltookit	<i>Phaeodactylum tricornutum</i>	-	72 h	Growth inhibition	[23]
	Pseudomonas putida growth inhibition	<i>Pseudomonas putida</i>	-	16 h	Bacterial cytotoxicity	[64]
	ToxAlert® 100	<i>Vibrio fischeri</i>	-	n.d. (ISO 11348-3)	Bacterial cytotoxicity	[88]
	Zebrafish Embryo Assay	<i>Danio rerio</i>	-	96 h	Lethality	[90]
Cytotoxicity	Alamar blue	<i>Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), macrophage cell line (J774A.1 ;THP-1)	24 - 48 h	Cytotoxicity	[28, 69, 71]
	Alkaline Phosphatase Assay	<i>Homo sapiens</i>	adenocarcinoma epithelial cell line (A549)	16-18 h	Cytotoxicity	[81]
	ATP content	<i>Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), macrophage cell line (J774A.1)	24 h	Cytotoxicity	[71, 57]
	BrdU incorporation	<i>Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), macrophage cell line (J774A.1)	24 h	Cytotoxicity	[71]

	Assay	Organism	Cell line	Exposure duration	Effect	Literature
Cytotoxicity	Direct contact <i>in-vitro</i> Cytotoxicity Assay	<i>Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), macrophage cell line (RAW 264.7 ;THP-1)	48 h	Cytotoxicity	[55]
	LDH release	<i>Cricetinae; Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (BEAS-2B, 16HBE14o-), fibroblast cell line (WI-38 and CHL/IU), macrophage cell line (RAW264.7, J774, THP-1)	24 - 72 h	Cytotoxicity	[3, 11, 26, 30, 31, 36, 43, 46, 49, 50, 57, 58, 61, 68, 69, 71, 80, 81, 87]
	Morphological Transformation Assay	<i>Mus musculus</i>	fibroblast cell line(BALB/c 3T3 A31-1-1)	48 h	Cytotoxicity	[74, 84]
	Neutral Red	<i>Homo sapiens; Mus musculus</i>	bronchial epithelial cell line (BEAS-2B), fibroblast cell line (L929)	24 h	Cytotoxicity	[60, 72, 85]
	Trypan blue staining	<i>Mus musculus</i>	macrophage cell line (RAW264.7)	24 h	Cytotoxicity	[3, 79]
Cell viability	Crystal violet	<i>Homo sapiens; Mus musculus; Rattus</i>	adenocarcinoma epithelial cell line (A549), endothelial cell line (SVEC4-10), macrophage cell line (J774A.1); fibroblast cell line (Balb-c; RLF)	72 h	Cell viability	[37, 70, 80]
	MTT-Assay	<i>Cricetinae; Homo sapien; Mus musculus; Rattus</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (MRC-5, V79), endothelial cell line (SVEC4-10), fibroblast cell line (MEF, CHL/IU), hepatoma cell line (MH1C1, FaO), kidney cell line (BHK-21), macrophage cell line (RAW264.7, THP-1)	16 - 72 h	Cell viability	[7, 12, 16, 20, 23, 28, 29, 35-40, 45, 48-50, 55, 56, 61, 78, 79, 87, 89]
	Resazurin reduction	<i>Homo sapiens; Mus musculus</i>	adenocarcinoma epithelial cell line (A549), lymphoma cell line (EL-4); macrophage cell line (J774A.1)	24 h	Cell viability	[58, 63]

	Assay	Organism	Cell line	Exposure duration	Effect	Literature
Cell viability	WST-1 Assay	<i>Homo sapiens</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (BEAS-2B)	3 - 72 h	Cell viability	[3, 11]
	WST-8 Assay	<i>Homo sapiens</i>	bronchial epithelial cell line (HBE)	24 h	Cell viability	[33]
Mutagenicity/ Genotoxicity	Ames-test	<i>Salmonella typhimurium</i> (TA98, TA100, TA102, TA1535, YG1024, YG1029, YG1041)	-	48-66 h	Mutagenicity	[11, 22, 27, 54, 64, 72, 73, 77, 82]
	Chromosomal aberrations	<i>Cricetinae</i>	ovary epithelial cell line (CHO-K1)	3 h	Mutagenicity	[73]
	Comet Assay	<i>Cricetinae, Homo sapiens, Mus musculus, Rattus</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (BEAS-2B, MRC-5), bronchial epithelial cell line (V79), fibroblast cell line (MEF, Balb-c), hepatoma cell line (HepG2), macrophage cell line (RAW264.7, THP-1), primary leukocytes, primary lymphocytes	1 - 72 h	Mutagenicity	[3, 9, 12, 21, 22, 27, 28, 31, 32, 35, 41, 42, 45, 47, 48, 50, 54, 60, 61, 70, 75-77, 86]
	GADD45α-GFP GreenScreen® Human Cell Assay	<i>Homo sapiens</i>	GADD45α-GFP transfected lymphoma cell line (GenM-T01)	48 h	Mutagenicity	[35]
	Micronucleus test	<i>Cricetinae, Homo sapiens, Mus musculus</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (BEAS-2B, V79), macrophage cell line (RAW 264.7), ovary epithelial cell line (CHO-K1), primary leukocytes	4 -72 h	Mutagenicity	[22, 27, 31, 45, 47, 77, 79]
	Muta-Chromplate	<i>Salmonella typhimurium</i> (TA100, TA98)	-	n.d.	Mutagenicity	[89]

	Assay	Organism	Cell line	Exposure duration	Effect	Literature
Mutagenicity/ Genotoxicity	SOS-Chromotest	<i>Escherichia coli</i>	-	n.d.	Mutagenicity	[91]
	umuC Assay	<i>Salmonella typhimurium</i> (TA1535/pSK1002, NM3009)	-	2 h	Mutagenicity	[7, 10]
	Vitotox Assay	<i>Salmonella typhimurium</i> (TA104 recN2-4)	-	n.d.	Mutagenicity	[27]
oxidative stress	DCFH-DA Assay	<i>Homo sapiens, Mus musculus, Rattus</i>	adenocarcinoma epithelial cell line (A549), bronchial epithelial cell line (16HBE14o-), fibroblast cell line (MEF), hepatoma cell line (HepG2), macrophage cell line (NR8383, RAW 264.7, THP-1)	1- 24 h	Oxidative stress	[3, 26, 31, 35, 36, 43, 52, 53, 69, 75, 83]
	Fpg-modified Comet Assay	<i>Homo sapiens</i>	adenocarcinoma epithelial cell line (A549)	24h	Oxidative stress	[50]
	Superoxide anion generation	<i>Homo sapiens</i>	adenocarcinoma epithelial cell line (A549)	1 h	Oxidative stress	[78]