

APPENDIX C

Comparative LLNA: BrdU-FC, Traditional LLNA, Guinea Pig Skin Sensitization, and Human Data

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Appendix C Comparative Performance of the LLNA: BrdU-FC, Traditional LLNA, Guinea Pig, and Human Assays (in Alphabetic Order by Substance)

Substance Name	CASRN	LLNA Vehicle ¹	LLNA: BrdU-FC Call ²	Trad. LLNA Call ²	Guinea Pig Call ³	Human Call ⁴	Traditional LLNA Reference	Skin Irritant?	Skin Irritation Data Reference
4-Aminobenzoic acid	150-13-0	AOO	-	- 1.6 at 5%, 10%	+	-	Loveless et al. 1996	Irritant at 25% (humans)	Kligman 1966c
4-Aminophenol HCl	51-78-5	NA	+	NA	NA	NA	NA	Negative at ≤ 20% (GP)	Basketter and Scholes 1992c
Aniline	62-53-3	AOO	-	+ 3.6 at 50%, 100%	+	+	Basketter et al. 1991	Negative at 100% (GP)	Basketter et al. 2007g
Benzalkonium chloride	8001-54-5	ACE	+	+ 11.1 at 1%, 2%	-	+	Gerberick et al. 1992	Irritant at 2% ACE (mice)	Gerberick et al 2002
Benzocaine	94-09-7	AOO	+/-	+/- 7.6, 20%	+	+	Kimber et al. 1989b	Negative at ≤ 10% (GP)	Basketter and Scholes 1992c
Benzoic acid	65-85-0	DaAE (fc), ACE	-	- 0.9 at 10%, 20%	-	-	Gerberick et al. 1992	NA	NA
Benzoyl peroxide	94-36-0	ACE	+	+ 31.4 at 5%, 10%	+	+	Kimber et al. 1998	NA	NA
Chlorobenzene	108-90-7	AOO	-	- 1.7 at 10%, 25%	-	NA	Gerberick et al. 2005	NR	Basketter et al. 1998
Chlorpromazine + UVR	NA	NA	+	NA	NA	NA	NA	NA	NA
Citral	5392-40-5	DaAE (fc), AOO	+	+ 14.1, 25% 20.5, 20%	+	+	Basketter et al. 1991	Nonirritant @ 0.5% (GP)	Basketter et al. 2007g
Cobalt chloride	7646-79-9	L92 (fc), DMSO	+	+ 19.9, 5% 7.2, 5%	+	+	Ikarashi et al. 1992	Negative at ≤ 0.5% (GP)	Basketter and Scholes 1992c
Copper chloride	7758-89-6	DMSO	+	+ 13.8 at 2.5%, 5%	-	-	Basketter and Scholes 1992	Nonirritant at 0.25% (GP)	Basketter and Scholes 1992c
Croton oil	8001-28-3	NA	+	NA	NA	NA	NA	NA	NA
Diethylenetriamine	111-40-0	AOO	+	+ 12.1, 10%	+	+	Gerberick et al. 2005	NA	NA
2, 4-Dinitrochlorobenzene	97-00-7	AOO	+	+ 8.0, 0.1% 43.9, 0.25%	+	+	Kimber et al. 1995	Nonirritant at 0.1% (GP)	Basketter et al. 2007g

Substance Name	CASRN	LLNA Vehicle ¹	LLNA: BrdU-FC Call ²	Trad. LLNA Call ²	Guinea Pig Call ³	Human Call ⁴	Traditional LLNA Reference	Skin Irritant?	Skin Irritation Data Reference
Diphenylcyclopropanone	886-38-4	AOO	+	NR	NA	+	Basketter et al. 2000	NA	NA
Ethylene glycol dimethacrylate	97-90-5	MEK	+	+ 7.0, 50%	-	+	Gerberick et al. 2005	Nonirritant at 1% (GP)	Wahlberg and Boman 1985
Ethylenediamine	107-15-3	AOO	+	+ 6.1, 5%	+	+	Gerberick et al. 2005	Nonirritant at 2.5% (GP)	Basketter et al. 2007g
Eugenol	97-53-0	AOO	+	+ 17, 50%	+	+	Loveless et al. 1996	Mild Irritant at 100% (rabbits)	ECETOC #66, 1995
Fluorescein isothiocyanate	27072-45-3	Acetone /DBP	+	+ 16.6, 1.5%	NA	NA	Gerberick et al. 2005	NA	NA
Formaldehyde	50-00-0	DaAE (fc), AOO	+ 10.9, 2.5%	+ 11.9, 25%	+	+	Kimber et al. 1991b	Nonirritant at 2% (GP)	Basketter et al. 2007g
Glycerol	56-81-5	DMF	-	- 1.1 at 25%, 100%	-	-	Gerberick et al. 2005	NA	NA
Hexane	110-54-3	DaAE (fc), AOO	- 2.7, 100%	- 2.2, 100%	NA	-	Gerberick et al. 2005	Irritant at 100% (humans)	Kligman 1966c
Hexyl cinnamic aldehyde	101-86-0	AOO	+ 12.0, 25%	+ 20, 50%	+	+	Loveless et al. 1996	Mild Irritant at 100% (rabbits)	ECETOC #66, 1995
Hydrocortisone	50-23-7	NR	-	- 0.3 at 2.5%, 10%	NA	-	Scheider and Akkan 2004	Nonirritant at 25% (humans)	Kligman 1966c
Isoeugenol	97-54-1	AOO	+	+ 31, 5%	+	+	Basketter and Cadby 2004	Nonirritant at 5% (GP)	Basketter et al. 2007g
Isopropanol	67-63-0	AOO	-	- 1.7 at 10%, 50%	-	+	Gerberick et al. 2005	Negative at 100% (rabbits)	ECETOC #66, 1995
Isopropyl myristate	110-27-0	AOO	+	+ 3.4, 100%	NA	-	Gerberick et al. 2005	Negative at 100% (rabbits)	ECETOC #66, 1995
Lactic acid	50-21-5	DMSO	-	- 2.2, 25%	-	-	Gerberick et al. 2005	Slightly irritating at 10% aq (rabbits)	Cosmetic Ingredient Review Expert Panel 1998
Linalool	78-70-6	AOO	+	+ 8.3, 100%	NA	-	Ryan et al 2000	Mild Irritant at 100% (rabbits)	ECETOC #66, 1995
2-Mercaptobenzothiazole	149-30-4	DMF	+ 3.3, 25%	+ 8.6, 10%	+	+	Gerberick et al. 2005	Nonirritant at 10% (GP)	Basketter et al. 2007g

Substance Name	CASRN	LLNA Vehicle ¹	LLNA: BrdU-FC Call ²	Trad. LLNA Call ²	Guinea Pig Call ³	Human Call ⁴	Traditional LLNA Reference	Skin Irritant?	Skin Irritation Data Reference
6-Methylcoumarin	92-48-8	DaAE (fc), ACE	- 0.7 at 5%, 25%	- 0.9 at 10%, 20%	-	-	Gerberick et al. 1992	Mild Irritant at 100% (rabbits)	Opdyke 1976b
Methyl salicylate	119-36-8	AOO	-	- 2.9, 20%	-	-	Kimber et al. 1995	Irritant at 10% AOO (mice)	Gerberick et al 2002
Nickel chloride	7718-54-9	DMSO	-	- 2.4, 5%	+	+	Basketter and Scholes 1992	Negative at ≤ 0.15% (GP)	Basketter and Scholes 1992c
Oxazalone	15646-46-5	DaAE (fc); AOO	+ 14.3, 0.025%	+ 59, 0.05%	+	+	Loveless et al. 1996	NA	NA
4-phenylenediamine	106-50-3	AOO	+	+ 26.4, 1%	+	+	Gerberick et al. 2004	Nonirritant at 0.5% (GP)	Basketter et al. 2007g
Potassium dichromate	7778-50-9	L92 (fc), DMSO	+ 4.9, 0.5%	+ 33.6, 0.5%	+	+	Kimber et al. 1991b	Nonirritant at 0.15% (GP)	Basketter et al. 2007g
Propylene glycol	57-55-6	Water	-	- 1.6, 100%	-	+	Gerberick et al. 2005	Nonirritant at 25% (humans)	Kligman 1966c
Propylparaben	94-13-3	AOO	-	- 1.4 at 5%, 25%	-	+	Gerberick et al. 2005	Nonirritant at 10% (GP)	Basketter and Scholes 1992c
Pyridine	110-86-1	AOO	+	+ 3.9, 100%	NA	+	Gerberick et al 2005	NA	NA
Resorcinol	108-46-3	AOO	+	+ 10.4, 50%	-	+	Basketter et al. 2007d	Nonirritant at 15% (humans)	Kligman 1966c
Salicylic acid	69-72-7	AOO	-	- 2.5, 25%	-	-	Gerberick et al 2005	Irritant at 20% (mice)	Gerberick et al. 2002
Sodium lauryl sulfate	151-21-3	DMSO (fc), DMF	+ 4.7, 25%	+ 8.9, 20%	-	-	Loveless et al. 1996	Irritant at 20% (rabbits)	ECETOC #66, 1995
Sulfanilimide	63-74-1	DMF	-	- 1 at 10%, 50%	-	+	Gerberick et al 2005	Nonirritant at 25% (humans)	Kligman 1966c
Tetrachlorosalicylanilide	1154-59-2	DaAE (fc), ACE	+ 5.8, 0.1%	+ 18, 1%	+	+	Gerberick et al 2005	NA	NA
Trimellitic anhydride	552-30-7	AOO	+	+ 4.6, 25%	+	NA	Gerberick et al. 2005	Negative at ≤ 10% (GP)	Basketter and Scholes 1992c
Tween 80	9005-65-6	AOO	+	NR	-	+	Basketter et al 2000	Nonirritant at 25% (humans)	Kligman 1966c
Xylene	1330-20-7	AOO	+	+ 3.1, 100%	NA	-	Basketter et al 1996	Irritant at 100% (humans)	Kligman 1966c

Abbreviations: CASRN = Chemical Abstract Services Registry Number; GP = guinea pig; LLNA = local lymph node assay; LLNA: BrdU-FC = murine local lymph node assay with flow cytometry measurements of bromodeoxyuridine; Trad. LLNA = murine local lymph node assay using radioactivity to detect sensitizers; NA = not available; NR = not reported; NT = not tested.

¹ Vehicles apply to tests for the traditional LLNA and/or for the LLNA: BrdU-FC; ACE = acetone; AOO = acetone:olive oil (4:1); DaAE = dimethylacetamide/ acetone/ethanol; DMF = dimethylformamide; DMSO = dimethyl sulfoxide; L92 = 1% pluronic acid L92 surfactant in water; MEK = methyl ethyl ketone. Vehicle information reported for the LLNA: BrdU-FC is designated by “fc” after the corresponding vehicle; no vehicle information was available for the substances without SI values in the LLNA: BrdU-FC.

² + = sensitizer; - = nonsensitizer; +/- = equivocal (i.e., produced an equal number of divergent results when tested at least twice). The numbers below the “+” or “-” calls are the highest SI and the maximum concentration tested, unless the highest SI occurred at a lower concentration, in which case, that lower concentration is listed in addition to the maximum concentration.

³ Calls are as noted above, and they are derived from ICCVAM (1999) based on studies using either the guinea pig maximization test or the Buehler test.

⁴ Outcomes obtained by studies conducted with the human maximization test or the inclusion of the test substance in a human patch test allergen kit.