TABLE 1. STANDARD COSMETIC SAFETY TESTS: ANIMALS VS. ALTERNATIVES - TIME, COST, ACCURACY

ANIMAL TEST	TIME	COST, $	ACCURACY	ALTERNATIVE TEST	TIME	COST, $	ACCURACY
Skin absorption: Substance is rubbed onto shaved backs of rats who are killed	1 day	1000-5000	Over predicts by a factor of 3	Ex vivo human skin-based tests for this are well established	1 day	1000-5000	Highly accurate as uses human skin
Irritation/ corrosion (skin): Substance is rubbed into the shaved backs of rabbits and they may then be killed	2 weeks	1,800	56%	Reconstituted human epidermis (RHE) skin models are accepted	1 day	500-850	76%
Irritation/ corrosion (eye): Substance placed into the eyes of live rabbits and they may be then be killed	3 weeks	1,800	Very unreliable, low to moderate correlation with humans	Eyes from animals killed for food can detect non-irritants and severe irritants (BCOP and ICE ex vivo eye models). Human corneal epithelial models (HCE) can detect non-irritants	1 day	1,400 (BCOP)	82% (HCE predictive of rabbit test)
Skin sensitisation: Substance is rubbed onto the shaved skin of guinea pigs or painted into ears of mice who are then killed	3-4 weeks for guinea pigs or 6 days for mice	9,300 (LLNA)	72-82% (for mouse test)	Several tests based on human skin cells have been accepted (DPRA, Keratinocyte assay, and h-CLAT)	1-2 days	8,400	90-100% (using strategy of 1-3 tests)
Acute toxicity: Rats are exposed to very high dose of substance such that a number of them are expected to die	14 days	1,800	Results can differ between species by several orders of magnitude	Cell based tests such as the NRU3T3 can predict lack of toxicity very accurately	1 day	1,300	81% (predicting non-toxic substances)
Mutagenicity/ genotoxicity: Substance force-fed or injected into mice or rats who are then killed	14 days	20,000-32,000	Not known	A testing battery of 2 or 3 cell-based tests. Positives should be assumed to be genotoxic	1-3 days	8,000-20,000	85-90% (predictive of the rat test)
Repeated dose: Rats are force-fed, forced to inhale or have substance rubbed onto their skin daily before they are killed	28 or 90 days	140,000 (90-day)	40-60%	TTC concept or read across from similar substances with test data	1-2 days	3000 for expert time	n/a

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