In vitro vitotoxicity test as an alternative to *in vivo* Draize test for the evaluation of cosmetic

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The procedures described by Draize are the basis of both ocular and cutaneous irritation tests and have been adopted internationally for *in vivo* evaluation of products and substances. However, they have been criticized for ethical reasons, due to their cruelty towards animals. Therefore, alternative methodologies are being studied to evaluate the toxicity of products, which have contact with human beings. Thus, a comparative study was performed between ocular, cutaneous and oral mucosa irritation tests using rabbits and *in vitro* tests through agar diffusion method and neutral red uptake method, both with the use of NCTC clone 929, FPC-IAL and SIRC cell lines. Lipsticks, makeup base, face powder, blushes, eye shadows, mascara, pencils and eyeliners, as well as liquid soap for children and adult use were evaluated. The *in vivo* tests and the cell lines used in the agar diffusion test were chosen according to the place where the products are used. Only the NCTC clone 929 linage was used in the evaluation of all the samples. From the 204 analyzed samples, 141 were evaluated through the cutaneous irritation test and FPC-IAL lineage, 80 through the ocular irritation test and SIRC lineage, and 78 through the oral mucosa irritation test and FPC-IAL lineage. Only the samples of liquid soap were also evaluated through the neutral red uptake method with the three cells lines. The samples submitted to the *in vitro* evaluation were analyzed in different concentrations and the observed parameter was cellular viability with the use of neutral red. The results obtained revealed that the agar diffusion test positive samples which presented up to degree 3 zone rate, that is cellular death halo varying from 0,5 to 1,0cm from the samples, according to USP 25, didn't provoke ocular, cutaneous or oral mucosa irritation. The samples which presented degree 4 zone also showed different degrees of ocular and cutaneous irritation, except to two units of liquid soap for children use which didn't present *in vivo* reactions, although citotoxicity up to 10% concentration. This method showed significant correlation with the ocular irritation test and also concerning the individual values of cornea and conjunctiva. As for the neutral red uptake test, it presented significant correlation in the ocular and cutaneous irritation test, what make it possible to infer that when the liquid soap samples present IC_{50} above 0,085% they won't cause ocular and cutaneous irritations in rabbits. No relation was observed between the origin of the cell lines and the target tissue used in the *in vivo* test, having all the cellular lines shown significant correlation with the NCTC clone 929 line. According to the data, the *in vitro* methods are more sensitive and the diffusion agar method, using the American Pharmacopeia graduation, can be adopted as a screening procedure in the evaluation of cosmetics. This is a result of its capacity of predicting irritation, what largely contributes for the reduction of animal using tests.

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