

Salivary leucocytes: a suitable non-invasive alternative for the comet assay in human biomonitoring studies

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Traditionally, studies that explore DNA damage in populations by the comet assay employ leucocytes isolated from peripheral blood (PBL). However, validation of alternative non-invasive biomatrices would suppose an extension and potential advantage in the enforcement of this assay in human biomonitoring. The aims of this work were to test the validity of salivary leucocytes (SL) as a suitable sample for the comet assay, to evaluate the ability of this approach to detect different types of primary and oxidative DNA damage, and to determine whether frozen SL are still adequate to show these types of DNA damage. Fresh and frozen leucocytes isolated from saliva samples (six healthy non-smoking volunteers) were exposed to different kind of genotoxic agents inducing both primary DNA damage (methyl methanesulfonate, actinomycin-D, ultraviolet radiation) and oxidative damage (potassium bromate), and standard or enzyme-modified comet assay was carried out. Results were compared with those obtained from PBL. Dose-dependent increases of primary and oxidative DNA damage were found in cells exposed to all genotoxic agents, demonstrating the adequacy of these samples to detect genetic damage from different nature. Comparing basal DNA damage, only a mild significant increase in primary DNA damage in frozen SL relative to the other biomatrices was obtained, but similar outcomes were found regarding sensitivity to induction of DNA damage by all agents tested. This work demonstrates that SL can be used in comet assay as an alternative or complement to blood samples. Frozen SL were proved to be a very suitable sample in wide biomonitoring studies.

Funding This work was supported by Xunta de Galicia [ED431B 2019/02] and Ministerio de Educación, Cultura y Deporte [BEAGAL18/00142 to V.V.]. The authors would also like to acknowledge the contribution of the hCOMET CA15132 COST Action.