Tear Levels of 8-hydroxy-2′-deoxyguanosine

I read with interest the article by Haworth and Chandler1 that reported tear levels of lipid peroxidation and DNA damage. These practical assays that quantify ocular surface damage in a relatively noninvasive way are useful. However, readers should be mindful that measurement of 8-hydroxy-2′-deoxyguanosine (8OHdG) as an indicator of DNA damage may have an additional source of variation not discussed in the article. As mentioned by the authors, the tear collection procedure was designed to obtain fluid and minimize any inadvertent acquisition of conjunctival cells, so the shedding of DNA by damaged cells may have largely contributed to the measured DNA oxidation. However, because extracellular (e)DNA may also be increased due to a decrease in tear nuclease activity due to dry eye,2,3 this may be a confounding factor in the assessment of oxidative stress. The greater the amount of eDNA in the tear, the more likely is a higher measured level of DNA-related damage. To understand elevated 8OHdG levels in the tear, it would be necessary to know the tear parameters that are used in dry eye assessment, such as tear break up times and Schirmer test results, in addition to factors responsible for oxidative stress assessed by the authors.

Should investigators want to directly assess cellular DNA damage instead of an indirect measure in tear fluid, obtaining ocular surface cells using an impression membrane,4,5 followed by similar assays for 8OHdGs, can potentially measure this.

Louis Tong1–4

1Ocular Surface Research Group, Singapore Eye Research Institute, Singapore; 2Cornea and external eye disease service, Singapore National Eye Center, Singapore; 3Eye-ACP, Duke-NUS Medical School, Singapore; and the 4Department of Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore.
E-mail: Louis.tong.h.t@singhealth.com.sg

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