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Simultaneous quantification of urinary 6-sulfatoxymelatonin and 8-hydroxy-2'-deoxyguanosine using liquid chromatography-tandem mass spectrometry

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Abstract

Oxidative stress is involved in the pathophysiology of many diseases and natural aging. Urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG), a stable product of DNA oxidative damage, has been widely used as an oxidative stress biomarker. However, only reporting 8-OHdG level, as commonly done previously, does not take into account of damaged DNA molecules that have not been repaired and excreted in urine. Melatonin is known to help with DNA repairs and hence can modify 8-OHdG levels. 6-sulfatoxymelatonin (aMT6s) is a major metabolite of melatonin excreted in urine. Hence it is useful to measure both urinary 8-OHdG and aMT6s together. Here we describe a newly developed and validated method to simultaneously measure these two compounds using high-performance liquid chromatography-tandem mass spectrometry. Using a liquid-liquid extraction (20% methanol) at a pH~7, as opposed to a solid-phase extraction used previously, substantially expedited the sample pretreatment process. The calibration curves