

# Ways to Measure DNA Damage



Oxidative damage to DNA and RNA is associated with a variety of diseases including cancer, aging, and obesity. During the repair processes to correct damage to DNA or RNA, several oxidized guanine species are released that can serve as biomarkers of oxidative stress found in urine. These damage markers include the ribose-free base (8-hydroxyguanine), the nucleoside from RNA (8-hydroxyguanosine), and the deoxynucleoside from DNA (8-hydroxy-2'-deoxyguanosine). While 8-hydroxy-2'-deoxyguanosine is an accepted biomarker for oxidative damage to DNA, researchers are increasingly assessing biomarkers of RNA damage to capture a more biologically relevant read of oxidative damage. From well-characterized ELISAs to mass spectrometry, Cayman offers multiple options to monitor oxidative damage to DNA and RNA.

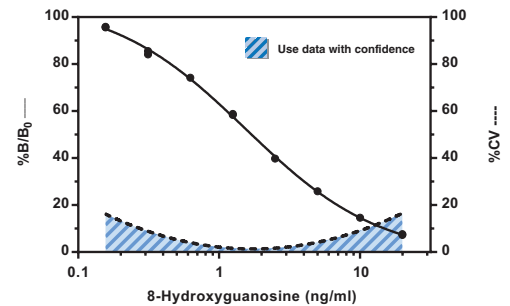
## DNA/RNA Damage ELISA Kits:

*Measure a set of biologically relevant oxidative stress markers*

### DNA/RNA Oxidative Damage (Clone 7E6.9) ELISA Kit

*Item No. 501130*

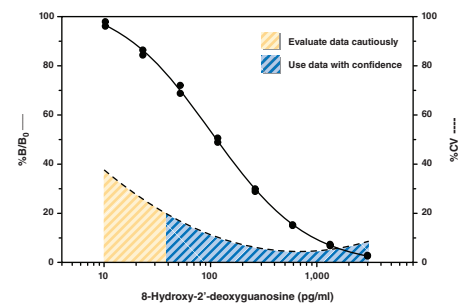
- Measure DNA oxidative damage marker 8-hydroxy-2'-deoxyguanosine and RNA damage marker 8-hydroxyguanosine with equal selectivity and sensitivity
- Cross reactivity of clone 7E6.9 validated by mass spectrometry
- Measure 8-hydroxyguanosine levels down to 0.45 ng/ml
- **Incubation:** 18 hours | **Development:** 90-120 minutes
- **Read:** Colorimetric at 405-420 nm



### DNA/RNA Oxidative Damage (High Sensitivity) ELISA Kit

*Item No. 589320*

- Measure major oxidative damage markers 8-hydroxy-2'-deoxyguanosine, 8-hydroxyguanosine, and 8-hydroxyguanine in urine, cell culture medium, cell lysates, tissue samples, saliva, and plasma/serum samples
- **Assay Range:** 10.3-3,000 pg/ml
- **Incubation:** 18 hours | **Development:** 90-120 minutes
- **Read:** Colorimetric at 405-420 nm



## Biomarker Services:

*Let Cayman analyze your samples*

Have the experts in Cayman's Contract Services run your samples in either of the above ELISAs, select any assay from our catalog of well-characterized kits, or let our experts design an assay to fit your specific project needs.

# Analytical Chemistry Services:

## LC-MS/MS quantitative analysis of 8-OH-dG and 8-OH-G

Mass spectrometry (MS) is becoming an alternative analytical technique to immunoassays because of its inherent specificity advantage and multiplexing capabilities. The accuracy and certainty make MS an increasingly popular method of choice.

Due to cross reactivity of antibodies, ELISAs that measure 8-hydroxy-2'-deoxyguanosine (8-OH-dG) and 8-hydroxyguanosine (8-OH-G) are only capable of reporting the sum total of these analytes. LC-MS/MS, on the other hand, provides the opportunity to measure each of these analytes simultaneously down to biologically relevant levels in as little as 10 µl of urine.

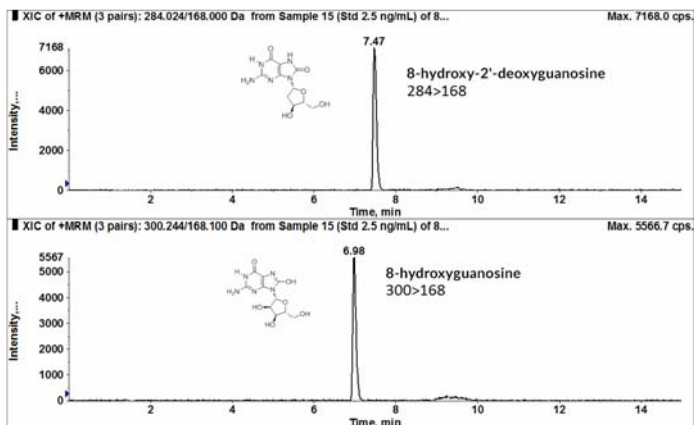


Figure 1. LC-MS/MS chromatograms for each analyte within the same run.

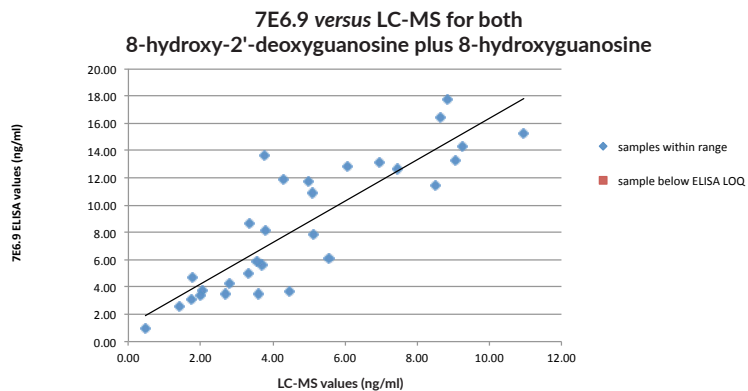


Figure 2. 30 human urine samples were quantified by 7E6.9-based ELISA and the sum of 8-OH-dG and 8-OH-G by LC-MS.

Standard Recovery	100%
Precision (1 ng/ml in urine)	3.74% RSD (n=6)
LOQ	100 pg/ml
LOD	30 pg/ml

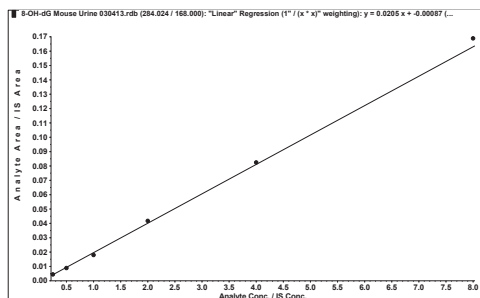


Figure 3. 8-OH-dG calibration curve (100-8,000 pg/ml)

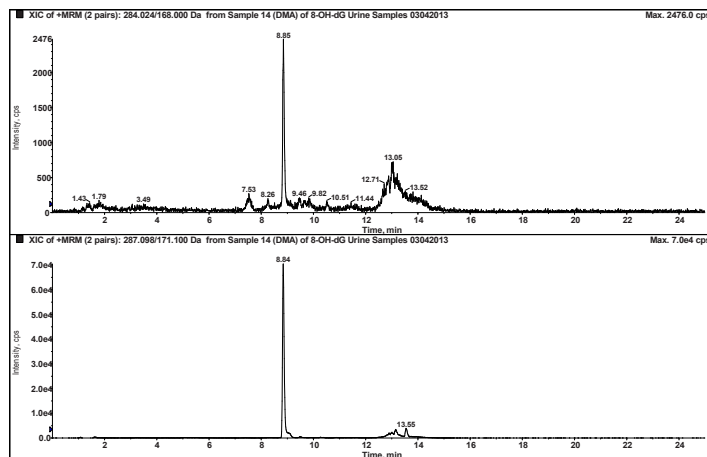


Figure 4. 8-OH-dG results in 10 µl mouse urine sample.



Discover more ways to measure DNA damage on [www.caymanchem.com](http://www.caymanchem.com)

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