

The enemy at the gates? DNA adducts as biomarkers of exposure to exogenous and endogenous genotoxic agents.

[Shuker DE.](#)

Department of Chemistry, The Open University, Walton Hall, Milton Keynes, UK.

Abstract

Genomic DNA is under continuous assault by various chemical species produced by normal cellular metabolism. In addition, exposure to exogenous agents adds further insult. Modification of DNA by chemical carcinogens has long been recognized as an early event in carcinogenesis and many DNA adducts have been characterized. There appears to be great value in using DNA adducts as markers of exposure to genotoxic (i.e. DNA-damaging) agents and some may be even more useful as indicators of risk of disease. Studies of the relationship between aflatoxin exposure and liver cancer have illustrated particularly well the advantages of using specific DNA adducts and other biomarkers, not only to better characteristic the risk factors, but also as endpoints in intervention studies. DNA adducts of endogenous genotoxins such as malondialdehyde and nitrosated glycine are particularly informative in studies of the effects of diet on cancer risk. DNA adducts may also be useful in identifying no-exposure levels in risk assessment of low-level environmental exposures such as 1,3-butadiene (BD).