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## Impact of gallic acid on DNA damage and health related biochemical parameters in obese mice

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Obesity and overweight are important risk factors for diseases, including many forms of cancer. It is known that damage of the genetic material plays a key role in malignant transformation, therefore the aim of present study was to investigate the induction of DNA damage by obesity and its prevention by gallic acid (GA), a common dietary phenolic in various inner organs of mice. The extent of DNA damage was monitored in female and male C57BL/J mice which were fed either with a standard diet or a high fat diet for 15 weeks. Furthermore the obese animals received GA (2, 25, 50 mg/kg B.W) in drinking water. We observed significant induction of DNA damage in single cell gel electrophoresis (SCGE) assays which detect double strand breaks, single strand breaks and apurinic sites, in liver, brain, colon and blood, as well as increased formation of oxidized purines/pyrimidine, in obese males and females, while only moderate effects were

observed in white adipose tissue. Low doses of GA which correlated to the daily intake in humans led to pronounced reduction of DNA damage in all organs. Biochemical measurements showed that the pattern of DNA damage correlates with changes of glucose metabolism but not with the activation of NF-kappa B in hepatic tissue and also not with alterations of the redox status (GSH, TBARS and GPx). Taken together, our findings indicate that obesity causes genomic instability as well as oxidative damage of DNA-bases in multiple organs of both sexes which may be related to alterations of the glucose metabolism. Furthermore, our results show that these effects can be reduced by low doses of GA which is contained in certain plant foods, and beverages.

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