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### Impact of nutrition and life style on formation of micronuclei and other nuclear anomalies in buccal cells

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Only few dietary studies have been realized in which the impact of vitamins (vitamin and provitamin A, tocopherol, folate) on buccal micronuclei (MN) were studied and in most of them (>90%) evidence for beneficial effects were found.

The technique was also frequently used to study the consequences of consumption of various drugs. Consistently positive effects were observed in tobacco chewers (> 20 studies) and in heavy smokers (> 15). Interestingly, we observed an inverse correlation between the nicotine contents of cigarettes and MN formation while a positive correlation with the tar contents was observed. In a well-designed older trial evidence for a synergistic effect between alcohol consumption and smoking was observed. Alcohol intake per se caused no clear effects in a number of investigations.

Several studies showed that betel and areca nuts chewing (with and without tobacco) and consumption of khat leaves lead to increased MN frequencies. This observation may explain the high incidence of oral cancer in areas where these chewing habits are prevalent. It is also notable that synthetic derivatives of ephedrine as well as synthetic and natural cannabinoids led to increased MN frequencies in in vitro experiments with cells from respiratory/oral tract. On the contrary, no evidence of MN induction was seen in a study which we realized in South America (Peru) with coca leave chewers (i.e. in this case even a decrease of the MN frequencies was observed).

A substantial number of studies (in total 17) concern the effects of mobile phone specific electromagnetic fields. High quality studies (n=4) yielded consistently negative results. Also in our investigation with highly controlled exposure via head phones (Knasmueller et al., unpublished) no evidence for positive results was found.

Taken together, the available data show that MN assays reflect health risks as a consequence of exposure to certain drugs; the results of dietary studies are scare and no firm conclusion can be drawn.

#### **Keywords:**

micronuclei, life style, cancer, drugs, mobile phone radiation.