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Diploma Thesis



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Diploma Thesis from the year 2007 in the subject Medicine - Human Genetics, grade: 1,0, University of Vienna

(Institut für Ernährungswissenschaften), 96 entries in the bibliography, language: English, abstract: The aim of the present study was to investigate the effect of a triathlon (3.8 km swim, 180 km cycle, 42.2 km run) on the genomic stability of nine highly trained non-professional athletes. Therefore, the SCE assay, a relevant biological response marker for genotoxicity in human biomonitoring studies [PENDZICH et al., 1997] was performed using peripheral lymphocytes, on account of their effortless accessibility [WILKOSCY and RYNARD, 1990]. Duplicate lymphocyte cell cultures, of each participant, were incubated for 72 h (37°C, 5% CO₂) according to a short-term human lymphocyte cell culture. For each participant at least 50 metaphases, containing 43-46 chromosomes were scored, to evaluate the mean SCE frequency. The number of SCEs per cell was calculated to a chromosome set of a normal diploid human cell, containing 46 chromosomes. In the present study the alteration of SCE frequency, 48 h pre- and 24 h post-race was evaluated. As an additional endpoint Top 5 HFCs (highest five absolute SCE means) were assayed. It could be demonstrated that both the total mean SCE frequency and the mean Top 5 HFC frequency (n=9) 24 h post-race were significantly decreased (*p 0.05) compared to 48 h pre-race values. Considering the training status, a significant negative correlation between the relative SCE changes before and after the triathlon was observed for the cycling training per week (km) (r=-0.86; **p 0.01), the running training per week (km) (r=-0.90; *p 0.05) as well as for the weekly net exercise training time (h) (r=-0.89; *p 0.05). The relative changes of Top 5 HFCs before and after the race correlated significantly with the cycling training per week (km) (r=-0.79; *p 0.05) and with the body mass index (kg/m²) (r=-0.69; *p 0.05). These findings suggest