

Publication**Changes in Cartilage Biomarker Levels During a Transcontinental Multi-stage Footrace Over 4486 km****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 4179933**Author(s)** Mündermann, Annegret; Klenk, Christopher; Billich, Christian; Nüesch, Corina; Pagenstert, Geert; Schmidt-Trucksäss, Arno; Schütz, Uwe**Author(s) at UniBasel** [Mündermann, Annegret](#) ; [Nüesch, Corina](#) ; [Pagenstert, Geert](#) ; [Schmidt-Trucksäss, Arno](#) ; [Klenk, Christopher](#) ;**Year** 2017**Title** Changes in Cartilage Biomarker Levels During a Transcontinental Multistage Footrace Over 4486 km**Journal** The American journal of sports medicine**Volume** 45**Number** 11**Pages / Article-Number** 2630-2636

Cartilage turnover and load-induced tissue changes are frequently assessed by quantifying concentrations of cartilage biomarkers in serum. To date, information on the effects of ultramarathon running on articular cartilage is scarce.; Serum concentrations of cartilage oligomeric matrix protein (COMP), matrix metalloproteinase (MMP)-1, MMP-3, MMP-9, COL2-3/4C long mono (C2C), procollagen type II C-terminal propeptide (CPII), and C2C:CPII will increase throughout a multistage ultramarathon.; Descriptive laboratory study.; Blood samples were collected from 36 runners (4 female; mean age, 49.0 \pm 10.7 years; mean body mass index, 23.1 \pm 2.3 kg/m² [start] and 21.4 \pm 1.9 kg/m² [finish]) before (t₀) and during (t₁: 1002 km; t₂: 2132 km; t₃: 3234 km; t₄: 4039 km) a 4486-km multistage ultramarathon. Serum COMP, MMP-1, MMP-3, MMP-9, C2C, and CPII levels were assessed using commercial enzyme-linked immunosorbent assays. Linear mixed models were used to detect significant changes in serum biomarker levels over time with the time-varying covariates of body weight, running speed, and daily running time.; Serum concentrations of COMP, MMP-9, and MMP-3 changed significantly throughout the multistage ultramarathon. On average, concentrations increased during the first measurement interval (MI1: t₁-t₀) by 22.5% for COMP (95% CI, 0.29-0.71 ng/mL), 22.3% for MMP-3 (95% CI, 0.24-15.37 ng/mL), and 95.6% for MMP-9 (95% CI, 81.7-414.5 ng/mL) and remained stable throughout MI2, MI3, and MI4. Serum concentrations of MMP-1, C2C, CPII, and C2C:CPII did not change significantly throughout the multistage ultramarathon. Changes in MMP-3 were statistically associated with changes in COMP throughout the ultramarathon race (MMP-3: Wald Z = 3.476, P = .001).; Elevated COMP levels indicate increased COMP turnover in response to extreme running, and the association between load-induced changes in MMP-3 and changes in COMP suggests the possibility that MMP-3 may be involved in the degradation of COMP.; These results suggest that articular cartilage is able to adapt even to extreme physical activity, possibly explaining why the risk of degenerative joint disease is not elevated in the running population.

Publisher Sage**ISSN/ISBN** 0363-5465 ; 1552-3365**edoc-URL** <http://edoc.unibas.ch/58566/>**Full Text on edoc** Available;**Digital Object Identifier DOI** 10.1177/0363546517712945**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/28650691>

ISI-Number WOS:000408809800023

Document type (ISI) Article