

Publication

MicroRNAs as Biomarkers for Acute Atrial Remodeling in Marathon Runners (The miRathon Study—A Sub-Study of the Munich Marathon Study)

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Author(s) Clauss, Sebastian; Wakili, Reza; Hildebrand, Bianca; Kääb, Stefan; Hoster, Eva; Klier, Ina; Martens, Eimo; Hanley, Alan; Hanssen, Henner; Halle, Martin; Nickel, Thomas**Author(s) at UniBasel** [Hanssen, Henner](#) ;**Year** 2016**Title** MicroRNAs as Biomarkers for Acute Atrial Remodeling in Marathon Runners (The miRathon Study—A Sub-Study of the Munich Marathon Study)**Journal** PloS one**Volume** 11**Number** 2**Pages / Article-Number** e0148599

Physical activity is beneficial for individual health, but endurance sport is associated with the development of arrhythmias like atrial fibrillation. The underlying mechanisms leading to this increased risk are still not fully understood. MicroRNAs are important mediators of proarrhythmogenic remodeling and have potential value as biomarkers in cardiovascular diseases. Therefore, the objective of our study was to determine the value of circulating microRNAs as potential biomarkers for atrial remodeling in marathon runners (miRathon study).; 30 marathon runners were recruited into our study and were divided into two age-matched groups depending on the training status: elite (ER, ≥ 55 km/week, $n = 15$) and non-elite runners (NER, ≤ 40 km/week, $n = 15$). All runners participated in a 10 week training program before the marathon. MiRNA plasma levels were measured at 4 time points: at baseline (V1), after a 10 week training period (V2), immediately after the marathon (V3) and 24h later (V4). Additionally, we obtained clinical data including serum chemistry and echocardiography at each time point.; MiRNA plasma levels were similar in both groups over time with more pronounced changes in ER. After the marathon miR-30a plasma levels increased significantly in both groups. MiR-1 and miR-133a plasma levels also increased but showed significant changes in ER only. 24h after the marathon plasma levels returned to baseline. MiR-26a decreased significantly after the marathon in elite runners only and miR-29b showed a non-significant decrease over time in both groups. In ER miRNA plasma levels showed a significant correlation with LA diameter, in NER miRNA plasma levels did not correlate with echocardiographic parameters.; MiRNAs were differentially expressed in the plasma of marathon runners with more pronounced changes in ER. Plasma levels in ER correlate with left atrial diameter suggesting that circulating miRNAs could potentially serve as biomarkers of atrial remodeling in athletes.

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