# Healthy ageing: Effects of time-specific exercise on functional, structural, metabolic, and immune parameters in circadian context

**December, 16th 2024**

Unique protocol ID: APVV-21-0164

**Study protocol**

The training units within the experimental factor consist of 2 parts. From 2 TJs under expert guidance, always on Mondays and Fridays, in the gym of the Centre for Active Ageing of the FTVŠ UK and 1 home TJ according to the instructional video always on Wednesdays.

TJ in the premises of FTVŠ UK consisted of a warm-up lasting 15 min, which consisted of mobilization, stabilization part- in both 5 exercises in 1 series of 10 repetitions. This was followed by an integrative part to practice complex movement patterns, consisting of 3 exercises, 5-10 repetitions in one series. The main part consisted of a strength and endurance part. In the strength portion, probands complete 8 exercises, 4 exercises targeting the lower extremities and 4 exercises targeting the trunk and upper extremities at a tempo of 2120. For the lower limbs, these were complex exercises using equipment and tools, where proper technique was also emphasized. Mondays were trained in higher volume- 2x 12 reps at 12RM intensity and Fridays in volume 2x 8 reps but with higher resistance (8RM). The endurance part is performed on the "air-bike" trainer, where probands perform first 1 min free followed by 6x 20s "ON" and 40s "OFF". 20s "ON" is performed at an intensity of 60-70% of maximum heart rate.

**Statistical analysis**

Descriptive parameters will be reported as means ± standard deviations (SD) and 95% confidence intervals (95% CI). Normality of data distribution and homogeneity of data will be ascertained to ensure that the assumptions of the analysis are met, using the Shapiro-Wilk test, Levene's test (homogeneity).

The ANOVA test for repeated measures will be used to determine differences between experimental and control groups, as well as morning and afternoon groups, in all parameters.

Percentage changes in aMT6s concentration will be assessed separately for each subject. The mean value of aMT6s concentration in the control group will be taken as 100%. Based on this value, the percentage difference will be calculated after implementation of the experimental factor.

Results will be considered significant for values $<0.05$ and all statistical procedures will be performed using SPSS 23 (IBM, New York, USA).

Data analyzing sleep quality and movement during sleep will be analyzed automatically using Actiwatch Activity & Sleep Analysis 7 software.