

18 March 2025

PROTOCOL TITLE: Impact of erythropoietin on hematological adaptations and physical performance

NCT: 05078138

B5.8.1 Sample Size Estimation

Based on results for multiple outcomes across different studies (**Table 1**) a sample size of 8 is required to statistical significance.

Table 1: Previous study effect sizes

Study	Outcome	Delta	Effect Size	Sample Size
Thomson et al.	TTE	10 ± 6	1.40	7
Plenge et al.	Hct	5.1 ± 3	1.56	7
Caillaud et al.	CHO Oxidation	0.7 ± 0.3	1.24	4
Caillaud et al.	Fat Oxidation	0.2 ± 0.05	3.51	2

B5.8.2 Data analysis

Statistical analyses will be conducted using either SPSS (IBM Corp. Armonk, NY), SAS 9.3 (SAS Institute Inc., Carey, NC), or equivalent. Common descriptive statistics will be used to describe volunteer characteristics. Shapiro-Wilk tests will be used to determine normality of data. Paired t-tests will be used to assess phase effects (PRE vs. POST injection) for glucose turnover, and substrate oxidation. Repeated measures ANOVA will be used to assess main effects of time for physical performance. Mixed-model repeated measure ANOVA will be used to assess main effects of phase (PRE vs. POST injection), time and their interaction for blood analytes and muscle molecular analysis. If interactions are significant, appropriate post-hoc correction will be used to examine these relationships. Correlation coefficients and multiple regression analysis will be used to evaluate relationships between study outcome measures. The alpha level will be adjusted for multiple comparisons, with the level for statistical significance set at $P < 0.05$.

References

Thomsen JJ, Rentsch RL, Robach P, Calbet JA, Boushel R, Rasmussen P, Juel C, Lundby C. Prolonged administration of recombinant human erythropoietin increases submaximal performance more than maximal aerobic capacity. *Eur J Appl Physiol* 2007;101(4):481-6. doi: 10.1007/s00421-007-0522-8.

Caillaud C, Connes P, Ben Saad H, Mercier J. Erythropoietin enhances whole body lipid oxidation during prolonged exercise in humans. *J Physiol Biochem* 2015;71(1):9-16. doi: 10.1007/s13105-014-0374-8.

Plenge U, Belhage B, Guadalupe-Grau A, Andersen PR, Lundby C, Dela F, Stride N, Pott FC, Helge JW, Boushel R. Erythropoietin treatment enhances muscle mitochondrial capacity in humans. *Front Physiol* 2012;3:50. doi: 10.3389/fphys.2012.00050.