

PROJECT REVIEW

“Detection of rhEPO microdosing and small-volume blood transfusion”

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In this international collaborative project, we will consolidate and expand the existing Athletes Biological Passport (ABP) approach as well as evaluate new strategies for detection of blood manipulation.

The project consists of two clinical trials where samples are collected from four week doping regimes expected to be currently used by cheating athletes:

- A) autologous blood transfusion of volumes <150 ml packed red blood cells;
- B) frequent intravenous injections of <10 IU per kg bw of recombinant human erythropoietin.

Samples collected from these main trials will be subjected to different analytical approaches, comprising ABP analyses including the abnormal blood profile score (ABPS); evaluation of reticulocyte percentage as a standalone marker; evaluation of iron-homeostatic markers potential for revealing blood manipulation including analyses of the newly discovered hormone erythroferrone; metabolomics and proteomic analyses.

Thus the project covers a broad range of both well-known and new analytical strategies. Another unique and highly required part of the proposed project, is addressing if gender should be taken into account when interpreting fluctuations of existing and novel markers of blood volume manipulation.