"Atypical hemoglobin profile and erythroid-related miRNAs expressed following autologous blood transfusion: isolation of markers insensitive to physiological changes"

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In a funded WADA study recently completed (“Novel molecular biomarkers for detection of autologous blood transfusion in sport: fetal hemoglobin and microRNAs”) we tested the hypothesis that novel biomarkers as fetal hemoglobin (HbF) and related microRNAs might show changes of interest in a group of trained healthy volunteers exposed to ABT respect to controls. The first result of this study is the production of a validated WADA-UNIFEBiobank constituted of around 2000 plasma samples from control and ABT trained subjects. It is established that hypoxic and hyperoxic stimuli and blood manipulation during procedures of withdrawal and reinfusion (distress, ageing, apoptosis/degradation of circulating blood cells, effects of preservative substances, etc.) might induce a predictable and an unpredictable series of changes of miRNAs expression. Therefore, we hypothesized that after significant blood collection and autologous reinfusion, the miRNA network in the athlete’s plasma is changed, allowing to generate integrated molecular profiles permitting to predict ABT. Therefore, the hypothesis is that a miRNA pathway might be much more informative than a single miRNA, even if demonstrated to be associated with ABT in a sub-set of athletes. To this end, a small sample of subjects enrolled for the cited study was recently spontaneously tested in our laboratory for a full genome analysis. Therefore the aim of this study is the validation of the first release of ABT-miRNA list and the identification of novel miRNAs of putative interest in predicting ABT following global miRNA analyses.