

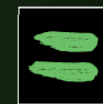
Tokyo, 7-8 November 2009



Symposium on Blood Manipulations & Doping in Sport - Concluding remarks



Celebrating a decade of **play true**



WADA





Blood Doping - Sessions

- I. ESA enhancing O₂ transport & delivery;
- II. Detection of Autologous Blood Transfusion;
- III. Environmental conditions affecting O₂ transport;
- IV. Longitudinal monitoring of blood variables.





Session I - ESA

- Use of EPO for doping – long road from Epoietins to CERA, Hematide, Epodure, etc.);
- EPO pathway complex, several molecular ‘players’ – multiple options for manipulation (rhEPO and analogues, EPO-R, HIF stabilizers, PHD and GATA-2 inhibitors, i.v. Fe, gene doping);
- Current methods still satisfactory – but for how long?
- Persisting challenge for detection of new ESAs targeting EPO pathway.





Session I - Recommendations

- Collect more blood samples globally;
- Blood boosting is essential in doping strategies, need to maintain efforts for detection of new substances;
- Continue efforts towards development of new methods (e.g. MAIIA);
- Need to develop global means to detect blood manipulations:
 - Athlete Passport now,
 - Genomics, Proteomics & Metabonomics on biological fluids in the future?





Session II - Detection of ABT

- Still a major challenge;
- Different approaches for detection:
 - Plastic markers and metabolites in urine & blood;
 - Proteomic approach: altered expression on RBC;
 - Longitudinal profiling:
 - Athlete Biological Passport experience (UCI)
 - tHb-mass (CO, NO?).





Session II - Recommendations

- Hb-mass to be refined:
 - technical (routine equipment)
 - legal (CO norms)
 - administrative (education operators)
 - Further explore NO;
- Further develop plastic residues approach;
- Proteomics : promising but remain pilot level for:
 - Identification of markers.
 - Matrix for analysis (urine, blood)



Session III – Manipulation of O₂ transport

- Hypoxic conditions may enhance physiological capacities (Hb, EPO, VO₂-max), but individual athletic response to altitude can vary including from exposure to exposure;
- Moderate altitude/hypoxic conditions are safe in healthy individuals. High altitude or severe hypoxia may have serious health effects. Long-term effects of intermittent exposure are less known;
- HBO therapy finds promising applications in healing/recovery, but does not appear performance-enhancing.
- Devices claiming to modify oxygen molecular status are unlikely to affect performance but health risk of ROS is emphasized.





Session IV - Longitudinal monitoring

Athlete Biological Passport

- Strategic change in testing: 1) from population-based to individual variations; 2) from single-substance approach to alteration of a biological pathway/system;
- Precise Rules & Protocols required: Blood collection, transport, storage, analysis, interpretation;
- Network of laboratories / costs to NADOs/IFs;
- UCI experience – successful, well perceived, potentially deterring;
- Inclusion of additional variables (tHb-mass, steroids profile, endocrine module).

