PROJECT REVIEW

"Rapid affinity purification process of EPO from urine as pre-treatment step for the IEF EPO doping test"

J. Carlsson (Uppsala University, Sweden)

Introduction of a rapid affinity purification step as pre-treatment for the isoelectric focusing (IEF) method used for revealing doping of recombinant EPO seems to provide a significant improvement for the existing IEF test. The present pre-treatment step with at least five centrifugation/ultrafiltration steps requires intensive hands-on during several hours while the affinity purification process can be optimised to a 25 minutes on-line process.

The first study of the affinity purification of EPO from urine, using the novel antiEPO monolith, showed high recoveries of EPO as well as maintained position of the isoform bands obtained in the IEF method. The content of urine proteins, besides EPO, was heavily reduced after the affinity purification step while EPO was concentrated 50 times.

In this project further improvements will be introduced in the affinity purification process to obtain an easy-to-use regime optimised for the IEF method. In the next step a production project will be started in order to implement the procedure at some doping laboratories during 2008.

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Results and Conclusions

A rapid and easy-to-use affinity purification process has been optimised and evaluated by the Department of Physical and Analytical Chemistry, Surface Biotechnology, at Uppsala University during the WADA grant period. The work has been performed in co-operation with the Doping laboratory at Karolinska University Hospital and MAIIA Diagnostics in Sweden.

The affinity purification process has also been evaluated by the Oslo doping laboratory, as well as the Lausanne doping laboratory.

The small disposable MAIIA anti-EPO monolith column provides an easy-to-use procedure for purifying and concentrating EPO from urine specimens, using 24-columns vacuum manifold. The columns will be delivered together with the required buffers for performing the purification procedure.

Publications and Presentations

1- Lönnberg, M., Drevin, M., Carlsson, J. Ultra-sensitive immunochromatographic assay for quantitative determination of erythropoietin. Journal of Immunological Methods 339 (2008) 236–244.