

Sysmex America Hematology Analyzer *Diagnostic Instrument of Choice for UCI Cycling Event*

— Follows Summer Olympics Debut —

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Mundelein, Illinois, April 14, 2005 – In keeping with standards set forth by many international sports associations, the International Cycling Union (UCI) recently tested participants of the Union Cycliste Internationale Elite Track World Championships cycling event for blood doping and erythropoietin abuse— methods for artificially increasing red blood cell mass. The diagnostic instrument of choice for this testing was a Sysmex XE-2100 Automated Hematology Analyzer. Sysmex instruments were also used for testing athletes at the 2004 Tour de France (XT-2000i) and the 2004 Olympics in Athens (XE-2100).

Many athletes turn to blood doping based on the assumption that an increased oxygen carrying capacity of the red blood cells leads to enhanced athletic performance – despite physiological evidence that oxygen is abundantly available at a mitochondrial level in skeletal muscle during endurance exercise.

“Since the late 1980’s, blood doping has been achieved through the administration of recombinant human erythropoietin (rHuEpo), a genetically engineered protein, which is structurally almost identical to the naturally occurring erythropoietin produced by the kidneys to stimulate red cell production,” said Ian Giles, M.D., Director of Scientific Affairs for Sysmex America, Inc. “While administering rHuEpo is a legitimate medical treatment of renal failure, and anemia secondary to the destruction of renal tissue, rHuEpo poses potential health risks for athletes including systemic hypertension and thrombo-embolic events,” said Giles. The use of rHuEpo is officially prohibited by the International Olympic Committee (IOC) and other major sporting organizations.

Commonly used blood testing parameters to identify athletes who are blood doping include hemoglobin, hematocrit, absolute and percentage reticulocyte (immature red blood cells) counts and ratios that can be used to sub-classify the results into ON (currently blood doping) and OFF (recently stopped blood doping). The power of the XE-2100’s patented fluorescent flow cytometry and advanced cell-counting methods, coupled with Sysmex’s reagent sophistication, offers a complete blood count and fully automated reticulocyte results with a precision and sensitivity that have been reviewed and accepted by most sporting organizations.



ADT Event Center

“A primary focus of our WADA (World Anti-doping Agency) accredited anti-doping laboratory is to reduce the risk of serious complications associated with blood doping among athletes. With the evidence of illegal doping leading to an athlete’s ban from competitive sports, it is absolutely critical that the diagnostic tools meet a scientific standard of technical superiority and accuracy. Our laboratory has found that Sysmex hematology analyzers meet these standards and, as such, are the instrument of choice for our anti-doping laboratory, the Laboratoire Suisse d’Analyse du Dopage”, said Neil Robinson, Ph.D., Laboratory Supervisor, Laboratoire Suisse d’Analyse du Dopage (Lausanne, Switzerland).



Velo out

Another Sysmex instrument, the XT-2000i, is also used for this testing since it is even smaller and more transportable than the XE-2100; yet it uses the same technologies to provide reticulocyte analysis and other comparable results. The testing for the Union Cycliste Internationale event was conducted by the Laboratoire Suisse d’Analyse du Dopage on the campus of Advanced Medical Analysis Laboratory, LLC. The event was held at the ADT Event Center’s velodrome in Carson, California.



Group at AMA

About Laboratoire Suisse d’Analyse du Dopage

The Laboratoire Suisse d’Analyse du Dopage (LAD) is a WADA and is ISO 17025 accredited anti-doping laboratory. The laboratory is part of the Legal Medicine department of the University of Lausanne and routinely performs urine and blood anti-doping tests. As the laboratory is attached to the main University Hospital of the Canton of Vaud (CHUV, Lausanne), all other testing areas are covered such as endocrinology, microbiology, parasitology, and other clinical laboratory disciplines.

About Advanced Medical Analysis

Advanced Medical Analysis Laboratory, LLC provides full-service laboratory capabilities in the testing areas of hematology, immunohematology, immunology, serology, chemistry, special chemistry, toxicology, endocrinology, microbiology, parasitology, cytology and histology. The laboratory is CLIA-certified and licensed by the State of California, as an independent clinical laboratory. It follows the guidelines stipulated by the California Department of Health Services, and the Clinical Laboratory Improvement Act of 1988.

About Sysmex

Sysmex Corporation (Kobe, Japan) is a world leader in clinical laboratory systematization and solutions, including clinical diagnostics, automation and information systems that elevate clinical laboratory medicine to first-line patient care. Sysmex America, Inc. focuses on extending the boundaries of diagnostic science while providing the management information tools that make a real difference in clinical and operational results for people worldwide. Additional information about Sysmex America, Inc. can be found at www.sysmex.com/usa.



Sysmex Routine analyzers

Sysmex Hematology Analyzer Instrument of Choice for UCI Cycling Event Q & A

Q *What is blood doping?*

A The term “blood doping” was introduced by the media in the 1970’s to describe the use of blood transfusion to artificially increase red cell mass. Autologous (derived or transferred from the same individual’s body) transfusions have been used extensively for this purpose.

Q *Why would elite athletes choose blood doping?*

A Over the years, a belief has evolved that increased oxygen carrying capacity of red blood cells leads to enhanced athletic performance – in spite of physiological evidence that oxygen is abundantly available at a mitochondrial level in skeletal muscle during endurance exercise. This belief has encouraged elite athletes to increase their red cell count in a number of different ways.

Q *By what means would elite athletes choose to increase their red cell population?*

A Living and training at higher altitudes is one approach. This stimulates the body to produce more circulating red blood cells in response to the lower oxygen concentration found at higher altitudes. Simulated altitude environments can be created at low altitudes in order to have the same effect on the red cell population. The administration of recombinant human erythropoietin (rHuEpo) is another.

Q *What is recombinant human erythropoietin?*

A Since the late 1980’s, blood doping has been achieved through the administration of recombinant human erythropoietin (rHuEpo). rHuEpo is a genetically engineered protein, structurally almost identical to the naturally occurring erythropoietin which is produced by the kidneys to stimulate red cell production. More than 500,000 patients throughout the world are currently receiving rHuEpo for legitimate medical treatment of renal failure, and for testing the anemia which is secondary to destruction of renal tissue.

Q *Is recombinant human erythropoietin safe for elite athletes?*

A Epo abuse is not without risk to athletes. Some of the potential health risks include systemic hypertension, thrombo-embolic events (blood clot formation), PRCA (pure red cell aplasia due to the development of anti-erythropoietin antibodies) and the effects of iron overload. Paradoxically, publication of the risks posed by abused substances has done little to discourage the practice. As such, anti-doping agencies are primarily focused on reducing the risk of serious complications in athletes.

Q *What is the position of the International Olympic Committee (IOC) and other major sporting organizations on Epo abuse?*

A The use of rHuEpo is officially prohibited by the IOC and other major sporting organizations. In 1989, the IOC Medical Commission introduced restrictions on the new doping class of peptide hormone analogues, which includes rHuEpo among others, and the releasing factors for these hormones. These efforts parallel the ability to manufacture biological peptides and proteins.

Q *How is blood doping detected?*

A The general approach is to use indirect methods for screening, and more specific methods for firm evidence of exogenous rHuEpo. The indirect methods vary by institution, but they involve using multiple hematological parameters to identify athletes who are actively practicing blood doping at the time of analysis, and those who have recently undergone blood doping of one form or another.

The most commonly used blood count parameters are hemoglobin, hematocrit, absolute and percentage reticulocyte (immature form of red blood cells) counts, and ratios that can be used to sub-classify the results into ON (currently practicing) and OFF (recently stopped blood doping). Positive results are graded, and appropriate further action is taken; this usually involves more specific testing for detection of exogenous rHuEpo.

Specific testing methods, although confirmatory, need to evolve constantly. Currently, rHuEpo can be detected in urine, but this might become more challenging as cell culture derived products become available. The expense of conducting specific tests is not justifiable as first-line investigation.

Q *Why were the Sysmex hematology analyzers the diagnostic instruments of choice for UCI's recent Union Cycliste Internationale Elite Track World Championships, the 2004 Tour de France and the 2004 Athens Olympic Games?*

A A primary focus of anti-doping agencies is to reduce the risk of serious complications associated with blood doping among athletes. With the evidence of illegal doping leading to an athlete's ban from competitive sports, it is absolutely critical that the diagnostic tools meet their scientific standard of technical superiority and accuracy.

Q *What factors set apart Sysmex hematology analyzers from other diagnostic instrumentation?*

- A** Calibration is stable, and precision of the relevant parameters is excellent. In fact, Sysmex pioneered the IRF parameters and the automation of reticulocyte analysis. Polymethine dyes provide reagent sophistication that enhances the analytical sensitivity of cell counting. High signal to noise ratios reduce interference and allow better sub-classification of cell types and instrument calibration is stable. Additionally, the smaller-sized Sysmex XT-2000i hematology analyzer offers portability and results are compatible since the reagent systems are identical to the larger instruments.

Q *How will Sysmex America's continued commitment to technical innovation benefit major sporting organizations in the future?*

- A** Currently, Sysmex has a software product that may be applicable in the anti-doping arena. Sysmex is due to launch the XE RET master software package in the U.S. shortly. Ret-He parameter(FDA 510(k) approved : K050589) may be applicable in the anti-doping arena, and the potential applicability of these parameters to anti-doping is currently being investigated. A description of the use of Sysmex analyzers at the 2004 Athens Olympic Games is viewable at : <http://www.sysmex.co.jp/en/news/press/2004/040811.html>