DRUG OF ABUSE TESTING

OVERVIEW AND MENU FOR THE AU480/AU680/AU5800 AND DxC 700 AU CLINICAL CHEMISTRY SYSTEMS

Introduction

In 2014, it was estimated that 247 million people worldwide used illicit drugs at least once in the past year, 29 million of whom suffer from drug-use disorders. However, only one out of every six people with a drug-use disorder is in treatment.[1]

Commonly abused illicit drugs include cannabis, cocaine, opiates and amphetamines. Cannabis is the most widely cultivated, trafficked and abused illicit drug globally, making up half of all law-enforcement drug seizures worldwide.[2]

In 2013, an estimated 24.6 million Americans aged 12 years or older—or, 9.4 percent of the U.S. population—have used an illicit drug in the past month. This number is up from 8.3 percent in 2002, which mostly reflects the recent rise in marijuana use.[3]

Unfortunately, prescription drug abuse is on the rise, as well. As reported in its 2016 report, the International Narcotics Control Board stated that prescription drug abuse has increased considerably more than illegal drug use.

Overview:

An effective drug of abuse testing (DAT) program requires high-quality assays and a comprehensive, broad menu to support drug-testing laboratories' goals. SYVA® Enzyme Multiplied Immunoassay Technique (EMIT®) DAT panel offers a comprehensive menu of reliable assays with ready-to-use reagents for effective testing on the AU480, AU680, AU5800 and DxC 700 AU analyzers. With the flexibility to report results in both qualitative and semiquantitative modes, SYVA's EMIT DAT menu offers tests for commonly abused drugs such as alcohol, cannabinoids, amphetamines, opiates, barbiturates, ecstasy, benzodiazepine, methadone, amphetamine, phencyclidine, propoxyphene and cocaine.

BECKMAN COULTER
Move healthcare forward.

Product Benefits:

Beckman Coulter offers a comprehensive panel of DAT assays, allowing greater consolidation of testing on one system. The SYVA EMIT DAT menu is designed to measure microscopic amounts of drugs and/or drug metabolites in human biological fluids. It combines the specificity and sensitivity of immunoassay with the convenient speed and reproducibility of enzyme measurements.

High-quality assays are extremely useful in meeting demanding laboratory needs for routine analytical drug and/or metabolite determinations. They also help optimize laboratories' clinical and operational efficiency.

SYVA EMIT DAT assay feature:

- Ready-to-use, all-liquid reagents, controls and calibrators with convenient storage at 2–8° C (36–46° F)
- AU barcoded bottles
- Calibrators and controls traceable to the gold standard for gas chromatography and mass spectrometry (GC/MS)
- Serum and plasma testing capabilities available for alcohol, barbiturate serum toxicology, benzodiazepine serum toxicology and tricyclics serum toxicology reagents

Methodology:

SYVA EMIT DAT chemistry utilizes a homogenous enzyme immunoassay method. The assay is based on competition between a particular drug in the specimen and the drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites.

Since enzyme activity decreases upon binding to the antibody, the drug concentration is measured in terms of enzyme activity. Active enzyme converts nicotinamide adenine dinucleotide (NAD) to NADH—the reduced form of NAD—resulting in an absorbance change that is measured spectrophotometrically at 340 nm. Endogenous serum G6PDH does not interfere, because the coenzyme NAD functions only with the bacterial (i.e., *Leuconostoc mesenteroides*) enzyme employed in the assay.

Qualitative results are expressed as positive or negative answers based on a comparison of the sample rate to the calibrated cutoff rate, which indicates whether a particular substance or analyte is present in the specimen. Semiquantitative results are calculated through the use of multiple calibrator levels to provide an approximate cumulative concentration of the drugs and metabolites detected by the reagent.

Results obtained during the screen provide a reliable estimate of drug concentration that can be used to prepare an appropriate dilution for GC/MS confirmatory testing. Semiquantitative drug screening reagents can be a valuable tool in the evaluation of drug treatment plan, compliance prescription or nonprescription drug abuse, and drug overdose medical emergencies.

Expanded DAT Menu Offering

- 6-acetylmorphine
- Alcohol
- Amphetamines
- Barbiturates
- Barbiturate Serum Tox*
- Benzodiazepine
- Benzodiazepine Serum Tox*
- Buprenorphine
- Cannabinoid
- Cocaine Metabolite
- Ecstasy
- Methadone
- Methaqualone
- Opiate
- LSD
- Phencyclidine
- Propoxyphene
- Tricyclics Serum Tox*

*Siemens SYVA® EMIT® off-the-shelf kits are NOT packaged in AU bottles.

For more information on DAT assays for the Beckman Coulter AU clinical systems, please visit www.siemens.com/bci-applications or contact your local sales representative today.

1. UNITED NATIONS OFFICE ON DRUGS AND CRIME, World Drug Report 2016. New York, United Nations, 2016.

2. INTERNATIONAL NARCOTICS CONTROL BOARD, Report 2016. Vienna International Centre, Austria, 2016.

3. National Institute on Drug Abuse, Nationwide Trends, June 2015, https://www.drugabuse.gov/publications/drugfacts/nationwide-trends#asterisk. Accessed 25 Oct. 2017.

For Beckman Coulter's worldwide office locations and phone numbers, please visit www.beckmancoulter.com/contact

FL-47506