



Navy Drug Screening Laboratory Jacksonville

Screening News

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CO's Desk

The combination of gas chromatography and mass spectrometry (GC-MS) technologies has been the gold standard for confirming urinary drug/drug metabolites (analytes) of Department of Defense (DoD) and commercial forensic laboratories. However, GC-MS requires extensive sample preparation and long analytical run times.

In an effort to improve the efficiency of drug testing for the DoD, NDSL Jacksonville has been developing liquid chromatography-tandem mass spectrometry (LC-MS/MS) procedures for drug confirmations. Both GC-MS and LC-MS/MS provide accurate analyte identification by utilizing molecular characteristics such as mass, ion fragmentation patterns, and ion abundance. The basic difference between the two technologies is that GC-MS utilizes gas to carry the analytes through the separating column, while LC-MS/MS utilizes liquid. LC-MS/MS offers the advantage of simple sample preparation, shorter instrumental analysis time, and higher sample throughput. Overall, LC-MS/MS is an attractive technology for the analysis of urine samples containing multiple analytes.



FIGURE 1. LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY (LC-MS/MS)

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Our Confirmation Department successfully developed LC-MS/MS methods for the analysis of benzodiazepines (5 analytes) and opiates (4 analytes). Compared to our current GC-MS methods, LC-MS/MS reduces sample preparation time by 30% to 40%, reduces instrumental analysis time by 50%, and increases throughput by 3-fold.

The incorporation of the LC-MS/MS technology enhances NDSL Jacksonville's commitment to ensure Warfighter readiness by providing accurate and timely forensic (legally-defensible) analysis of urine specimens for the presence of controlled substances and illegal drugs.

C. J. LeBron
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Did you know?

Information about the laboratory, including fact sheets and past newsletters may be found at our website:

<http://www.med.navy.mil/sites/jaxdruglab/Pages/default.aspx>.

In Focus: Deputy Operations Officers



FIGURE 2. DEPUTY OPERATIONS OFFICERS
From left to right: LT Joshua Knapp, LT Erick Roman

NDSL Jacksonville is staffed by Navy Medical Service Corps (MSC) officers (the CO, the XO and two LTs). The MSC officers are traditionally part of the Biochemistry-Toxicology specialty. Navy Biochemists/Toxicologists fill several research, operational/chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE), and educational billets including staffing three Navy Drug Screening Laboratories. The two lieutenants at NDSL Jacksonville function as Deputy Operations Officers who oversee several departments.

LT Erick Roman is the Deputy Operations Officer for the Quality Control and Confirmation Departments. He arrived onboard NDSL Jacksonville in December 2011

Did you know?

Correspondence templates for technical reviews; summary reports; documentation packages; and copies of DD Forms 2624 can be found at our website: <http://www.med.navy.mil/sites/jaxdruglab/Pages/default.aspx>.

after leaving Johnson & Johnson where he was a Microbiology Analyst. He was born and raised in Arecibo, Puerto Rico and received his BSc in Biology and MSc in Molecular Biology from the University of Puerto Rico, Mayaguez in 1999 and 2002 respectively. In 2009, he received his PhD in Molecular and Cellular Biology from the University of Massachusetts, Amherst before starting a postdoctoral position at the University of North Carolina, Chapel Hill studying cancer biomarkers. LT Roman brings with him a strong molecular and cellular research and teaching background. When asked what he is looking to get out of his first Navy tour, he responded, “The leadership and training required to make significant contributions to the Navy’s Forensic and Toxicology programs.”

LT Joshua Knapp is the Deputy Operations Officer for the Accessioning, Initial Screening, and Support Services Departments. LT Knapp has been at NDSL Jacksonville since April 2012 — his first tour after commissioning straight out of graduate school. LT Knapp was born and raised in Vermont. He received a BSc in Biochemistry from the University of Vermont in 2005, and then switched coasts to begin his PhD in Biochemistry and Molecular Biology at the University of California, Riverside (UCR) that same year. Although his degree was in Biochemistry, his field of research was in genetic manipulation of medically significant insects in the Entomology department of UCR. LT Knapp entered the Navy because he wanted to use his education to serve his country. He’s looking forward to the challenges and leadership opportunities afforded by a career in the Navy.

Discrepancy of the Month: PD = Package Missing Signature/Date (PD)

Although we covered this topic in March 2011 and again in May 2012, we continue to assign this discrepancy code to packages from Commands. Because it is one of the easiest problem areas to rectify, we have decided to revisit this issue. A PD discrepancy code will be assigned if the outside of the shipping container does not have a signature and date. This protects the integrity of the specimens and also prevents undetected tampering of the specimens within the sealed package.

The Urinalysis Program Coordinator (UPC) Handbook published by Navy Personnel Command states, “Once the shipping container is ready to be sealed, the UPC shall seal all sides, edges, and flaps of the box with adhesive paper tape, and then sign and date across the top and bottom of each shipping container.” This must be done before the shipping container is placed in a second waterproof container.

Appendix E of the Marine Corps Personal Services Manual states, “Coordinator must ensure that each shipping container has the coordinator’s signature over the seal to ensure integrity of the specimens”. It goes on to say that this requirement applies to all methods of transportation including hand-carried specimens.

When this discrepancy code is applied, it is applied to every specimen inside the shipping container. For example, if there are 12 specimens in the box and the box is not signed and dated properly, then 12 discrepancies are applied.

On the other hand, if you are packaging 12 specimens for the shipment and you sign and date over the seal of the shipping container, that is 12 PDs that will not be assigned to your specimens. By placing the date and your signature over the seal of the shipping container, you can ensure that if the seal is broken and the package was opened prior to its arrival at the laboratory we will note it.

Take that last step to protect your collection process!

Did you know?

The most comprehensive information on nutritional supplements for military members can be found at the website: <http://hprc-online.org>.

Drug Facts: Supplements

Inquiries are occasionally received from Service Members who are concerned that the herbal, dietary, nutritional, or muscle-building supplements they are taking could produce a positive urinalysis drug test result. Before addressing this question, we will first review the purpose and implementation of DoD's drug testing program.

The purpose of the DoD urinalysis drug testing program is the detection and deterrence of illicit drug use among Service Members. This is accomplished by providing a urinalysis test result that specifically identifies a drug, or its metabolite, listed in the DoDI 1010.16 specified categories of controlled substances. By definition, a controlled substance is a drug or other substance, or immediate precursor, included in the Drug Enforcement Administration (DEA) Schedules I, II, III, IV, or V (DoDI 1010.01, Part II. Definitions, September 13, 2012).

Some controlled substances can be prescribed for use by a medical professional and this may be considered a legitimate and acceptable use of the medication; for example, Adderall® (*d*-amphetamine), Vicodin® (hydrocodone), and Percocet® (oxycodone). Use of these medications without a prescription is considered to be wrongful use.

Now let's get back to the question of using supplements. Supplements are not listed in the DEA Schedules as controlled substances and therefore, should not contain any controlled substances. However, the Food and Drug Administration (FDA) does not generally regulate the production and sale of supplements. As such, one should make sure that the supplements being used are purchased from a reliable source in the United States. In addition, one should be cautious when purchasing supplements over the internet or outside of the USA as the supplements may contain controlled substances and they may be classified as over-the-counter medications in their country of origin.

When considering the use of supplements, you should verify that the supplements are generally regarded as safe and/or effective. The Human Performance Resource Center (www.hprc-online.org) website, a DoD initiative under the Force Health and Readiness Program, contains a wealth of information on nutrition and supplements. Service Members are encouraged to visit the website and research supplements which they are considering using, prior to using them.

References:

1. U.S. Drug Enforcement Administration (DEA), Drug Information: Amphetamine.
2. National Institute on Drug Abuse, Research Report Series: Amphetamine Abuse and Addiction, 2006.

3. U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control, National Forensic Laboratory Information System (NFLIS): Special Report: ADD/ADHD Stimulants in NFLIS 2007-2011.

Ask the Expert

Did you know?

Information regarding natural medicines and alternative therapies, to include energy drinks and supplements, can be found at the website:
<http://naturaldatabase.therapeuticresearch.com/home.aspx?search=ND&cs=dod>.

1. If I take over-the-counter workout supplements (e.g., Jack3D or C4 Extreme), will I come up positive for *d*-amphetamine on a DoD urine drug test?

Answer: No, unless *d*-amphetamine is in the supplements. However, for more information, see OPERATION SUPPLEMENT SAFETY (OPSS), MARADMINS 562/12, 10/09/2012.

2. If I take over-the-counter cold medications (e.g., containing phenylephrine or pseudoephedrine), will I come up positive for *d*-amphetamine on a DoD urine drug test?

Answer: No. While over-the-counter cold medications often times contain sympathomimetic amines which are similar to amphetamines, they will not cause a confirmed positive result for *d*-amphetamine.

3. Has testing for benzodiazepines started and are all of my specimens being tested for this class of drugs?

Answer: Yes and No. Testing for benzodiazepines began in November 2012. Unless specifically requested, only 10% of all specimens are tested for this class of drugs. As such, general requests for “all drugs” testing will not include benzodiazepines.