

# Therapeutics & Toxins News

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*"In 2011, the FDA approved Telaprevir, an antiviral medication for the treatment of Hepatitis C Virus*

## Spotlight on TDM: Incivek (Telaprevir) Karen C. Thomas, PharmD, PhD, University of Utah

The Centers for Disease Control estimates that approximately 3.2 million Americans have chronic hepatitis C virus (HCV) infection, the leading cause of liver transplant in the United States. This year, the FDA approved two promising antiviral medications for the treatment of HCV infection. One of these medications is telaprevir (trade name Incivek), a protease inhibitor that is indicated to be used in combination with peginterferon alfa and ribavirin for the treatment of patients with chronic genotype 1 HCV with compensated liver disease. Telaprevir has several attributes that make it amenable to therapeutic drug monitoring for improved patient treatment: it is subject to numerous drug-drug interactions, it is highly metabolized by the cytochrome P450 (CYP450) enzyme system and it is highly protein bound. Treatment failure with this medication has led to



Logo for Therapeutic and Toxin Newsletter

emergence of telaprevir resistance-associated genetic substitutions, and most commonly occurred in patients who were previously null responders to treatment with cirrhosis. Telaprevir shows significant promise for changing the future of HCV treatment. Therapeutic

drug monitoring of telaprevir concentrations could improve patient care by ensuring patients achieve adequate serum drug concentrations.

There are six HCV genotypes with numerous subtypes, and genotype 1 HCV is

the most common in the United States. Telaprevir has been approved by the Food and Drug Administration for the treatment of genotype 1 HCV. Telaprevir must be administered in combination with peginterferon alfa and ribavirin, which are currently (continued on page 2)

## Bath Salts and Plant Food—"legal highs" for much longer? By Vilte Barakauskas, PhD, Clinical Chemistry Fellow, University of Utah

Beginning in 2010, poison control centers in the U.S. received notice of drug exposures involving substances marketed as bath salts, plant food, potpourri, insect repellent, and stain removers.<sup>1,2</sup> While labeled as household

items not for human consumption, the actual purpose of these products is to 'get high', while their composition and packaging allows them to evade detection and legislation. They can be purchased

over the internet, in local "head shops", gas stations, and convenience stores.<sup>1</sup> They are sold under a number of different names and their availability and/or incidence of use has (continued on page 3)

## Spotlight on TDM: Incivek (Telaprevir) (continued from page 1)

the recommended treatment for HCV from the American Association for the Study of Liver Diseases (AASLD). Telaprevir inhibits the HCV NS3/4A protease, which is essential for HCV replication. Telaprevir is given to patients three times daily with food for 12 weeks duration, in combination with peginterferon alfa and ribavirin treatment. The duration of continued treatment with peginterferon alfa and ribavirin is based upon HCV-RNA concentrations measured at weeks 4 and 12 of telaprevir treatment and may be an additional 12 to 24 weeks after finishing telaprevir.

Clinical studies showed that HCV patients who had not previously received any HCV treatment had a sustained virologic response of 79% (285/363 patients) in the telaprevir treatment group compared to placebo [46% sustained virologic response (166/361 patients)]. Both of those groups were treated with telaprevir or placebo in combination with peginterferon alfa and ribavirin. For HCV patients who had previously received HCV treatment, sustained virologic responses were also elevated in the telaprevir group when compared to placebo.

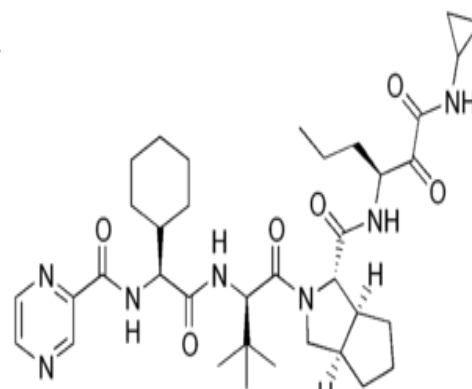
Two significant issues that will

be encountered with the clinical use of telaprevir is patient adherence to three times daily dosing and drug-drug interactions. Patients with HCV may have additional viral burden or concomitant medical conditions. Many significant drug interactions have already been documented with telaprevir because

it is a substrate and an inhibitor of CYP3A4 and a substrate of P-glycoprotein. The telaprevir package insert presents a list of potentially interacting drugs and the expected change in telaprevir or the drug of interest pharmacokinetics. These medications include other antivirals (e.g. rifampin and medications for HIV), immunosuppressants (tacrolimus and cyclosporine) and medications with narrow therapeutic indices (e.g. digoxin and amlodipine).

### Monitoring Telaprevir Concentrations

Suggested therapeutic and toxic ranges for telaprevir have not yet been established, but based on pharmacokinetic data to date patients will likely



**Structure of Incivek (Telaprevir)**

have a better response if their trough telaprevir concentrations are above 1000 ng/mL and likely above 2000 ng/mL and are treated with the dosing regimens approved by FDA.

In summary, telaprevir is a promising new drug for the treatment of hepatitis C infection. Patients treated with telaprevir in combination with peginterferon alfa and ribavirin have a high cure rate which results in decreased number of patients with advanced HCV infection. Therapeutic drug monitoring should play a role in the clinical management of patients on telaprevir due to the risk for so many drug interactions.

*“Two significant issues with clinical use of Telaprevir is patient adherence and drug-drug interactions.”*

### References

- 1) Incivek™ (telaprevir) package insert.
- 2) CDC website: <http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm>
- 3) Smith LS, Nelson M, Naik S, Woten J. Telaprevir: An NS3/4A Protease Inhibitor for the Treatment of Chronic Hepatitis C. *Ann Pharmacother*. 2011, 45: 639-48.
- 4) Ghany MG, Strader DB, Thomas DL, Seeff LB. Diagnosis, Management, and Treatment of Hepatitis C: An Update. *Hepatology*. 2009, 49: 1335-74.
- 5) Sarrazin C, Kieffer TL, Bartels D, Hanzelka B, Muh U, Welker M, Wincheringer D, Zhou Y, Chu HM, Lin C, Weegink C, Reesink H, Zeuzem S, Kwong AD. Dynamic Hepatitis C Virus Genotypic and Phenotypic Changes in Patients Treated With the Protease Inhibitor Telaprevir. *Gastroenterology*. 2007, 132:1767-1777.

*“Bath salts and similar ‘legal high’ products are composed of synthetic cathinones.”*

## Bath Salts (continued from page 1)

increased dramatically, as evidenced by an exponential increase in poison-control center calls related to ‘bath salt’ use. In 2010, 303 center calls were attributed to bath salts, whereas during the period of January – August 2011 over 4,700 of these calls had already been recorded.<sup>3</sup>

Bath salts and similar “legal high” products are composed of synthetic cathinones, derivatives of an active constituent of the khat plant.<sup>1,4</sup>

Mephedrone and MDPV are among these synthetic cathinones. These compounds share structural similarities and stimulant effects of phenylethylamines (Figure 1), acting to increase synaptic catecholamine concentrations with some compounds affecting serotonin as well.<sup>5,6</sup> Synthetic cathinones have been drugs of abuse for several decades. One of the more widely studied compounds, methcathinone (ephedrone) is reported to have been developed due to antidepressant and appetite suppressant potential. Instead, it ended up abused as a ‘designer drug’ in Russia with case reports surfacing in the U.S. in the early 90s.<sup>1,7</sup> Methcathinone and cathinone itself is a Schedule I regulated substance in the U.S.<sup>8</sup> Until very recently, other synthetic cathinones were not explicitly listed, leaving them in the “legal high” category, likely contributing their rapid rise in popularity.

### **Mephedrone**

Mephedrone is cited to have been synthesized in the late 1920s with recreational use surfacing eight decades later.<sup>9</sup> Mephedrone holds many colloquial names (Table 1). It is

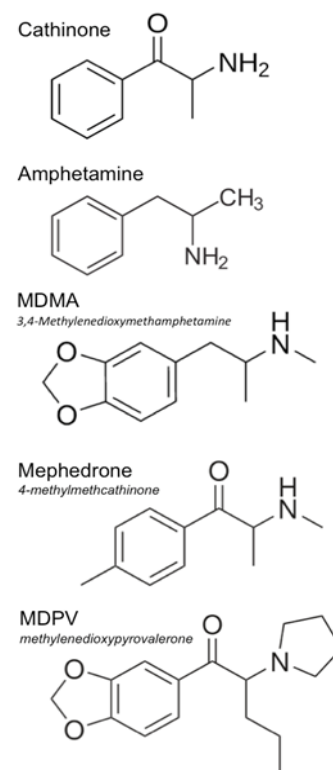
supplied in capsules, marketed as plant food, with dosing suggestions described for “large plants and small shrubs”.<sup>11</sup> It can also be obtained as loose powder and has repeatedly been identified as a constituent of bath salts.<sup>1,14</sup> Common routes of administration include oral ingestion of capsules or powder wrapped in cigarette paper, as well as insufflation, but other routes have also been described.<sup>9,1</sup>

Its rapid rise in popularity in Europe has been attributed to the unstable supply of other designer drugs.

Mephedrone-containing ‘ecstasy’ tablets have increasingly replaced MDMA, likely the result of curtailed diversion and production of MDMA.<sup>15</sup> Increasing numbers of mephedrone-related calls to poison control centers also indicate more prevalent use in recent years.<sup>10</sup>

Clinical effects of mephedrone reported by users and documented by poison control centers include: increased alertness, euphoria, talkativeness, drug cravings, depression, anxiety, psychosis, hyperactivity, dizziness, vision/eye disturbance, hyperthermia, nausea, tachycardia, ECG abnormalities, appetite suppression, bruxism, sleep disturbance, and lethargy.<sup>11,13,15</sup> Effects have been likened to MDMA, methamphetamine, and cocaine.<sup>16</sup> Some effects may persist more than 24 hours after exposure.<sup>10</sup>

The dangers of mephedrone were publicized in the media following deaths in the UK and Sweden. However, it is not always clear that the cause of



**Figure 1: Synthetic cathinones**

death is in fact mephedrone.<sup>10</sup> Case reports in the literature indicate that cardiac abnormalities, thermal regulation, and psychiatric symptoms are common at presentation. For example, myocardial inflammation with ST and troponin elevation was observed in a 20 year old male following ingestion of 1 g of “plant food”, confirmed to contain mephedrone, with no substances positive on a urine drug screen.<sup>17</sup> In another case where only mephedrone use was confirmed, a 15 year old female presented with altered mental status, nausea, vomiting and bradycardia. Laboratory testing indicated euvolemic hypo-osmotic hyponatremia and further studies also (continued on page 5)

## Spotlight on TDM: Incivek (Telaprevir) (continued from page 2)

<b>Absorption</b>	Peak concentration: 5-6 hours post dose Better absorption if taken with food
<b>Volume of Distribution</b>	Highly variable Vd/F ~252 L, accumulation in the liver
<b>Plasma Protein Binding</b>	59% to 76% bound
<b>Metabolism</b>	CYP3A4, and additional liver metabolism (hydrolysis, oxidation, reduction) with active metabolites
<b>Excretion</b>	82% in feces 9% expired air 1% in urine
<b>Half-Life (T<sub>1/2</sub>)</b>	At steady state, elimination half life is about 9-11 hours



<http://neglectedwar.com>

## Bath Salts (continued from page 3)

Table 1: Overview of subjectively reported and/or clinically observed effects arising from use of two synthetic cathinones as noted in the literature<sup>1,9,10,11,12</sup>

	MEPHDRONE	MDPV
Common name	4-methylmethcathinone	methylenedioxypropylvalerone
Example street names	Meow meow Bubbles Rush MMC Hammer Ketones Dove 4-MMC MCAT Meph	MDPV Hyperfocusine MDPK Magic Super coke Peevee
Clinical effects	Sympathomimetic syndrome Altered mental status, paranoia, hallucinations, anger	
Effect onset <sup>13</sup>	15-45 min (oral) 30 min (intranasal) 10-15 min (IV)	15-30 min (oral) 5-20 min (intranasal)
Effect duration <sup>13</sup>	2-5 h (oral) 2-3h (intranasal)	2-7 h (oral) 2-3.5 h (intranasal)

*“Mephedrone has been banned in many European countries.”*

## Bath Salts (continued from page 4)

identified encephalopathy and increased intracranial pressure.<sup>18</sup> It was postulated that mephedrone, like MDMA may cause SIADH through modulation of serotonin<sup>18</sup> potentially adding complexity to the clinical presentation.

Animal studies have confirmed that mephedrone shares pharmacological characteristics with MDMA and methamphetamine. Mephedrone inhibits striatal dopamine uptake, increases dopamine and serotonin release, inhibits hippocampal serotonin uptake, and repeated administration reduces monoamine transporter function.<sup>5,6</sup> Hyperthermia is also observed. Serotonergic deficits may be more persistent than dopaminergic effects. Animals will readily self-administer mephedrone, consistent with high drug abuse potential.<sup>5</sup>

Mephedrone metabolites have been identified in rat and human urine by GC-MS and a putative pathway for phase I metabolism proposed (Figure 2). Two metabolites are thought to also undergo glucuronidation and/or sulfation prior to excretion.<sup>19</sup>

### **MDPV**

In the US, MDPV appears more often in bath salts as compared with mephedrone.<sup>1</sup> Routes of administration are similar to those of mephedrone.<sup>12</sup> In addition to sympathomimetic effects similar to mephedrone, MDPV ingestion appears to be associated with hallucinations, delirium and aggressiveness; myoclonus, and creatine phosphokinase elevations have also been noted.<sup>1</sup> Subjective descriptions have likened its effects to methylphenidate and cocaine<sup>12</sup> and case reports in

the literature illustrate some effects. Six weeks of bath salt use resulted in altered mental status, paranoia, hyperactivity, fearfulness and anger in a young male. Two weeks of insufflation produced fearful paranoia and hallucinations, anxiety, and sleeplessness in a young female. A week's use by a middle-aged male produced paranoid hallucinations, hyperactivity and sleeplessness.<sup>20</sup> Large doses or prolonged exposures were associated with dangerous and paranoid behaviors reported to Poison control centers in Kentucky and Louisiana.<sup>1</sup> Treatment of exposed individuals included benzodiazepines and antipsychotic agents.

Metabolism of MDPV has been studied in rat and human urine samples and human liver microsomes.<sup>21,22</sup> A pathway for metabolism in humans has been proposed (Figure 3). Microsomal studies indicate that CYP1A2, 2D6 and 2C19 mediate the conversion of MDPV to demethylenyl-MDPV.<sup>21</sup>

### **Identification and Analysis**

Part of the difficulty in assessing the risk of synthetic cathinone use is due to confounding effects of concomitant substance use. It is difficult to link adverse events to cathinones specifically. In addition, analysis of bath salts and other “legal highs” has indicated that many products contain more than one compound (for example, multiple synthetic cathinones, caffeine, anesthetics, piperazines),<sup>1,14,23</sup> potentially producing heterogeneous pharmacological and clinical effects. These compounds are generally not detectable on routine drug screens.<sup>24</sup> Several

methods have been used to identify and characterize bath salt components. GC-MS and LC-MS/MS methods have been developed and used to identify metabolites in urine.<sup>19,21,25</sup>

Rapid identification of mephedrone based on microcrystalline structure following reaction with mercury chloride is also reported in the literature.<sup>26</sup> A few commercial labs in the U.S. (for example, NMS labs and Redwood Toxicology) offer testing for some synthetic cathinones. With increased use of bath salts, routine detection of synthetic cathinones will likely be necessary.

### **Legal no longer**

Mephedrone has been banned in many EU countries.<sup>27</sup> In response to the rapid increase in synthetic cathinone exposures seen in hospitals and poison control centers, synthetic cathinones have been banned in many states in the U.S. as well (Table 2). On September 8, 2011, the U.S. Federal Drug Enforcement Agency temporarily classified mephedrone, methylone, and MDPV as schedule 1 substances.<sup>30</sup> Legislative responses to these synthetic cathinones have been rapid in Europe and North America. However, they are still available for purchase, even if their presence in “legal high” products is not disclosed.<sup>14</sup> And, just as these substances succeeded other designer drugs following similar bans, it seems likely that bath salts may live on through other non-scheduled substances, including other synthetic cathinones.<sup>15,31</sup>

### Bath Salts (continued from page 5)

Figure 2: Mephedrone metabolism by Meyer et al. 2010

Note: Compounds in boxes are subject to glucuronidation and sulfation

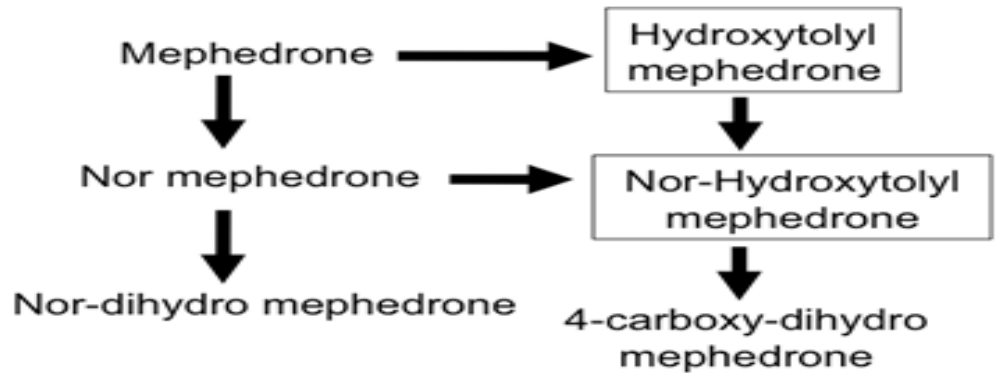


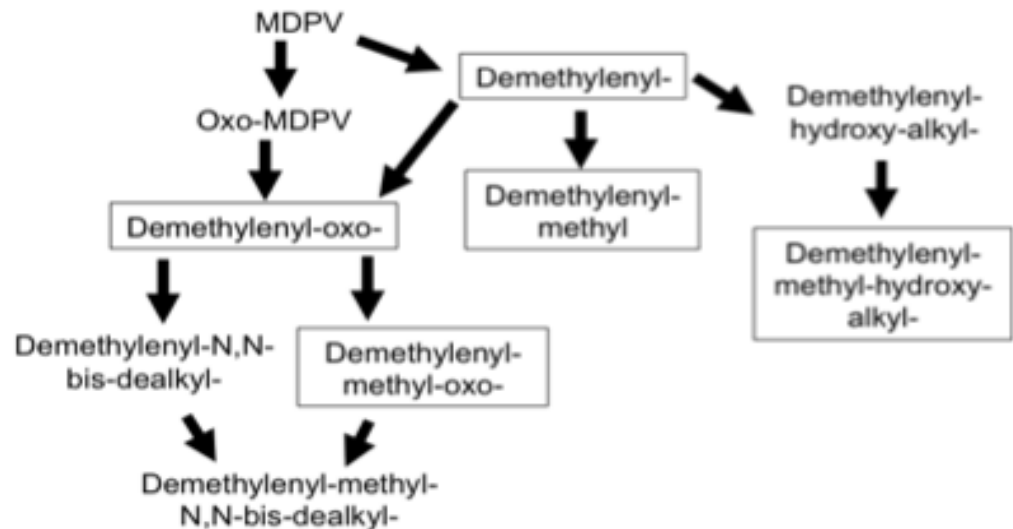
Table 2: States with enacted or pending legislation surrounding synthetic cathinone compounds<sup>27,28</sup>

Alabama	Illinois	Louisiana	New Mexico	Dakota	Utah
Arkansas	Idaho	Maine	New York	Ohio	Virginia
Delaware	Indiana	Michigan	North Carolina	Oklahoma	Washington
Florida	Iowa	Minnesota	North Carolina	Oregon	West Virginia
Georgia	Kansas	Mississippi	North	Pennsylvania	Wisconsin
Hawaii	Kentucky	New Jersey		Rhode Island	Wyoming
				Tennessee	

*“The U.S. Federal Drug Enforcement Agency temporarily classified mephedrone, methylone, and MDPV as schedule 1 substances.”*

Figure 3: MDPV metabolism by Meyer et al. 2010

Note: Compounds in boxes are subject to glucuronidation



## Bath Salts (continued from page 6)

### References

1. Spiller HA, Ryan ML, Weston RG, Jansen J. (2011). Clinical experience with and analytical confirmation of "bath salts" and "legal highs" (synthetic cathinones) in the United States. *Clin Toxicol.* 29: 499-505.
2. Centers for Disease Control and Prevention (CDC). (2011). Emergency department visits after use of a drug sold as "bath salts"--Michigan, November 13, 2010-March 31, 2011. *MMWR Morb Mortal Wkly Rep.* 60(19):624-7.
3. <http://www.aapcc.org/dnn/NewsandEvents/NewsMediaResources.aspx>
4. Lin CN. Khat. *AACC TDM and Toxicology Division Newsletter*, Spring 2011
5. Hadlock GC, Webb KM, McFadden LM, Chu PW, Ellis JD, Allen SC, Andrenyak DM, Vieira-Brock PL, German CL, Conrad KM, Hoonakker AJ, Gibb JW, Wilkins DG, Hanson GR, Fleckenstein AE. (2011). 4-Methylmethcathinone (mephedrone): neuropharmacological effects of a designer stimulant of abuse. *J Pharmacol Exp Ther.* Aug 2 epub: DOI:10.1124/jpet.111.184119
6. Kehr J, Ichinose F, Yoshitake S, Goiny M, Sievertsson T, Nyberg F, Yoshitake T. (2011). Mephedrone, compared to MDMA (ecstasy) and amphetamine, rapidly increases both dopamine and serotonin levels in nucleus accumbens of awake rats. *Br J Pharmacol.* "Accepted article"; doi: 10.1111/j.1476-5381.2011.01499.x
7. Emmerson ST, Cisek JE. 1993. Methcathinone: A Russian designer amphetamine infiltrates the rural Midwest. *Ann Emerg Med.* 22(12): 1897-1903.
8. <http://www.deadiversion.usdoj.gov/schedules/index.html>
9. Schifano F, Albanese A, Fergus S, Staier JL, Deluca P, Corazza O, Davey Z, Corkery J, Siemann H, Scherbaum N, Farre M, Torrens M, Demetrivcs Z, Ghodse AH, Psychonaut Wep Mapping, RedNET Research Groups. (2011). Mephedrone (4-methylmethcathinone; 'meow meow'): chemical, pharmacological and clinical issues. *Psychopharmacol.* 214: 593-602.
10. James D, Adams RD, Spears R, Cooper G, Lupton DJ, Thompson JP, Thomas SHL. (2011). Clinical characteristics of mephedrone toxicity reported to the UK national poisons information service. *Emerg Med J* 2011;28:686-689.
11. Psychonaut WebMapping Research Group (2009). Mephedrone report. Institute of Psychiatry, King's College London: London UK.
12. Psychonaut WebMapping Research Group (2009). MDPV report. Institute of Psychiatry, King's College London: London UK.
13. Karila L, Reynaud M. (2010). GHB and synthetic cathinones: clinical effects and potential consequences. *Drug Test Anal.* 3:552-559.
14. Brandt SD, Sumnal HR, Measham F, Cole J. (2010). Analysis of second-generaton 'legal highs' in the UK: initial findings. *Drug Test Anal.* 2(8): 377-382. Epub Sep 8. DOI: 10.1177/0269881110378370.
15. Brunt TM, Poortman A, Niesink RJM, van den Brink W. (2010). Instability of the ecstasy market and a new kid on the block: mephedrone. *J Psychopharmacol.*
16. Carhart-Harris RL, King LA, Nutt DJ. (2011). A web-based survey on mephedrone. *Drug Alcohol Depend.* 118(1):19-22.
17. Nicholson PJ, Quinn MJ, Dodd JD. (2010). Headshop heartached: acute mephedrone 'meow' myocarditis. *Heart.* 96:2051-2052.
18. Sammler EM, Foley PL, Lauder GD, Wilson SJ, Goudie AR, O'Riordan JI. (2010). A harmless high? *Lancet.* 379(9742): 742.
19. Meyer MR, Wilhelm J, Peters FT, Maurer H. (2010). Beta-keto amphetamines: studies on the metabolism of the designer drug mephedrone and toxicological detection of mephedrone, butylone, and methylone in urine using gas chromatography-mass spectrometry. *Anal Bioanal Chem.* 397:1225-1233.
20. Penders TM, Gestring R. (2011). Hallucinatory delirium following use of MDPV: "Bath Salts". *Gen Hosp Psychiatry.* 33:525-526.
21. Meyer MR, Du P, Schuster F, Maurer HH. (2010). Studies on the metabolism of the  $\alpha$ -pyrrolidinophenone designer drug methylenedioxy-pyrovalerone (MDPV) in rat and human urine and human liver microsomes using GC-MS and LC-high-resolution MS and its detectability in urine by GC-MS. *J Mass Spectrom.* 45(12):1426-42.
22. Strano-Rossi, S, Cadwallader AB, de la Torre X, Botre F. (2010). Toxicological determination and in vitro metabolism of the designer drug methylenedioxy-pyrovalerone (MPDV) by gas chromatography/



## Bath Salts (continued from page 7)

- mass spectrometry and liquid chromatography/ quadrupole time-of-flight mass spectrometry. *Rapid Commun. Mass Spectrom.* 24: 2706–2714.
23. Baron M, Elie M, Elie L. (2011). An analysis of legal highs-do they contain what it says on the tin? *Drug Test Anal.* 3(9):576-8.
24. U.S. Department of Justice, National Drug Intelligence Center. Situation Report: Synthetic cathinones (bath salts) and emerging domestic threat. July 2011. [www.justice.gov/ndic/pubs44/44571/44571p.pdf](http://www.justice.gov/ndic/pubs44/44571/44571p.pdf) accessed: Oct 9 2011
25. Bell C, George C, Kicman AT, Traynor A. (2011) Development of a rapid LC-MS/MS method for direct urinalysis of designer drugs. *Drug Test Anal.*3(7-8):496-504.
26. Elie L, Baron M, Croxton R, Elie M. (2011). Microcrystalline identification of selected designer drugs. *Forensic Sci Int.* doi:10.1016/j.forsciint.2011.08.005
27. <http://www.emcdda.europa.eu/publications/drug-profiles/synthetic-cathinones>
28. Substituted Cathinones Legislation. National Conference of State Legislatures. <http://www.ncsl.org/?TabId=22432> accessed: Oct 8 2011
29. <http://www.hdap.org/mdpv.html>
30. [http://www.deadiversion.usdoj.gov/fed\\_regs/rules/2011/fr0908.htm](http://www.deadiversion.usdoj.gov/fed_regs/rules/2011/fr0908.htm) accessed: Oct 2, 2011
31. De Paoli G, Maskell PD, Pounder DJ. (2011). Naphyrone: analytical profile of the new "legal high" substitute for mephedrone. *J Forensic Leg Med.* 18(2):93.

## UPCOMING MEETINGS OF INTEREST

### The Association for Mass Spectrometry Applications to the Clinical Lab (MSACL)

January 14-18, 2012, Sheraton San Diego Hotel & Marina, San Diego, CA.  
[www.msacl.org](http://www.msacl.org)

### AMERICAN ACADEMY OF FORENSIC SCIENCES (AAFS)

Annual Meeting  
 February 20-25, 2012, Atlanta Marriot Marquis, Atlanta, GA.  
[www.aafs.org](http://www.aafs.org)

### SOCIETY OF TOXICOLOGY (SOT)

Annual Meeting  
 March 11-15, 2012, Moscone Convention Center, San Francisco, CA.  
[www.toxicology.com](http://www.toxicology.com)

### MIDWEST ASSOCIATION FOR TOXICOLOGY AND THERAPEUTIC DRUG MONITORING (MATT)

Annual Meeting  
 May 2-4, 2012, Hyatt Lodge, Oakbrook, IL  
[www.midwesttox.org](http://www.midwesttox.org)

### SOUTHWESTERN ASSOCIATION OF TOXICOLOGISTS

Annual Meeting  
 May 3-5, 2012, Marriot Courtyard—Wichita at Old Town, San Antonio, TX  
[www.sat-tox.org](http://www.sat-tox.org)

### CALIFORNIA ASSOCIATION OF TOXICOLOGISTS

May 2012  
[www.cal-tox.org](http://www.cal-tox.org)



## UPCOMING MEETINGS OF INTEREST (continued)

### THE INTERNATIONAL ASSOCIATION OF FORENSIC TOXICOLOGISTS (TIAFT)

Annual Meeting  
June 3-8, 2012, Hamamatsu, Japan  
[www.tiaft.org](http://www.tiaft.org)

### SOCIETY OF FORENSIC TOXICOLOGISTS (SOFT)

Annual Meeting  
July 1-6, 2012, Boston, MA  
[www.soft-tox.org](http://www.soft-tox.org)

### AMERICAN ASSOCIATION FOR CLINICAL CHEMISTRY (AACC)

Annual Meeting  
July 15-19, 2012, Los Angeles, CA.  
[www.aacc.org](http://www.aacc.org)

### THE AMERICAN ACADEMY OF CLINICAL TOXICOLOGY

#### North American Congress of Clinical Toxicology

October 1-6, 2012, Las Vegas, NV

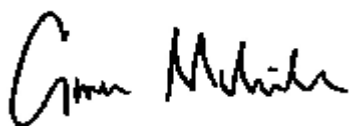
## FROM THE HOT SEAT:

Greetings Division Members,

I want to express appreciation to all those that joined us for the lunchtime business meeting at AACC in Atlanta! Thank-you! It was wonderful to see so many of you there!!! We enjoyed a wonderful presentation delivered by one of our 2010 young investigator award winners, Stacy Melanson, honored our 2011 award recipients, announced the election results, reviewed the Division activities and accomplishments over the past year, and discussed our plans for the coming year. In addition, I distributed a membership survey, that most attendees completed. Feedback from you, is critical for assuring that our Division grows, and serves a valuable resource for members! Based on results of that survey, we will plan to hold another lunchtime meeting, as part of the 2012 annual meeting in Los Angeles, because 61% of those surveyed prefer this time. Be sure to mark your calendars, for the lunch hour on Monday July 16<sup>th</sup>! We will allow more time for interaction at the meeting, because 64% of those surveyed indicate that the primary reason for membership in the Division, is networking. And, as a result of your great ideas, the Division supported the submission of several educational sessions for the 2012 meeting.

I hope that everyone also plans to attend the lunchtime meeting we will host in Los Angeles!

Sincerely,



*"Please attend the  
TDM/Tox Division  
Lunchtime meeting at  
the 2012 AACC Annual  
Conference in  
Los Angeles."*



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## DRUGS IN THE NEWS

### New FDA Drug Approvals

**Exparel (bupivacaine) Injectable Suspension-**  
Treatment for Pain

Approved: October 28, 2011

**Onfi (clobazam) Tablets**

Treatment for Lennox-Gastaut Syndrome

Approved: October 21, 2011

**Ferriprox (deferiprone) Tablets**

Treatment for Hemosiderosis

Approval: October 14, 2011

**Juvisync (simvastatin and sitagliptin) Tablets**

Treatment for Diabetes Mellitus Type II, Homozygous Familial Hypercholesterolemia, Heterozygous Familial Hypercholesterolemia, Hypertriglyceridemia

Approval: October 7, 2011

**Xalkori (crizotinib) Capsules**

Treatment for Non-Small Cell Lung Cancer

Approval: August 26, 2011

**Firazyr (icatibant) Injection**

Treatment for Angioedema

Approval: August 25, 2011



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