

## Drugs in the News:

### Levamisole: An Unusual Finding in a Cocaine Related Fatality

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The Los Angeles County Coroner's Toxicology Laboratory recently encountered an interesting case. The decedent, a 44-year-old female, was discovered unresponsive on the floor of her secured bathroom. She had a history of anxiety, high blood pressure, depression, cocaine use and an abusive ex-husband. A half empty prescription bottle of Alprazolam and a two-inch section of plastic straw with possible drug residue were recovered from the scene. Based on the circumstances of the case, the Deputy Medical Examiner deferred the cause of death for toxicology.

#### Toxicological Findings:

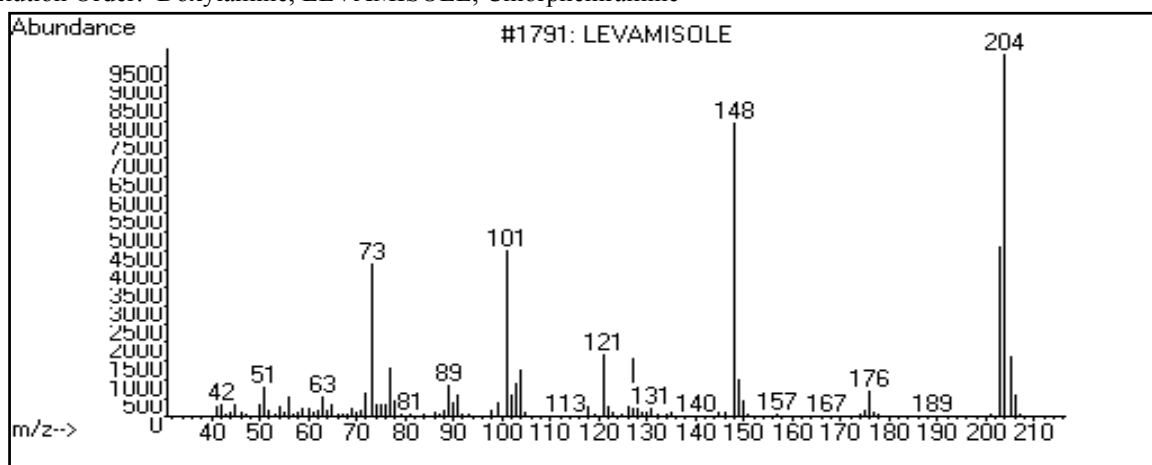
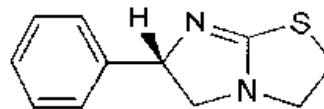
	Heart Blood	Femoral Blood
Cocaine	5.9 ug/mL	6.8 ug/mL
Benzoylcegonine	22 ug/mL	16 ug/mL
Metoprolol	0.18 ug/mL	---
Sertraline	0.18 ug/mL	---
Norsertaline	0.65 ug/mL	---
Alprazolam	ND	---
* Levamisole	2.8 ug/mL	2.2 ug/mL

\* **Levamisole** is primarily used in veterinary medicine to control parasites in livestock. It is supplied in oral tablets/pastes/gels/boluses, soluble powder, feed premixes, topical solutions and injectable solutions. Levamisole has also been used as an adjuvant treatment for malignant disease in humans. In Canada it is marketed by Janssen Pharmaceuticals under the trade name Ergamisol<sup>®</sup> for use in colon cancer treatment. Ergamisol<sup>®</sup> is supplied as a 50mg base oral tablet. Levamisole is not commercially available in the United States for human consumption.

Based on the indications for use of Levamisole and the limited availability in the United States, the presence of Levamisole was not consistent with the decedent's history. Further toxicological analysis was performed and examination of the plastic straw revealed the presence of Cocaine and Levamisole. It is speculated that the Levamisole was used as a cutting agent in this case. The final cause and manner of death were determined to be Cocaine Intoxication, Accident.

#### Levamisole Analytical Information

- Synonym: leva (l)-Tetramisole
- Chemical Name: (6S)-2,3,5,6-Tetrahydro-6-phenylimidazo[2,1-b]thiazole
- Chemical Formula: C<sub>11</sub>H<sub>12</sub>N<sub>2</sub>S•HCl
- Molecular Weight: 204.3
- Formula Weight: 240.8
- pK<sub>a</sub>: 8.0
- Levamisole is extracted using a basic liquid-liquid chlorobutane extraction with an acid back extraction.
- Levamisole is easily detected on the GC/NPD and GC/MS.
- Elution Order: Doxylamine, LEVAMISOLE, Chlorpheniramine



Note: Although this is one of the first documented postmortem cases, the Drug Enforcement Administration Southwest Laboratory has encountered Levamisole as an adulterant to cocaine over the past few years.