



CROSS REACTIVITY IN DRUGS OF ABUSE SCREENING

Immunoassay screens such as the ones used by STERLING are selected for their ability to detect drugs of a specific class with a high degree of reliability. Immunoassay reactive substances fall into two categories – members of the targeted drug class that are expected to be detected (true positives) and unrelated structurally similar substances that could be detected (false positives). When more information is needed concerning the nature of an immunoassay result, confirmation testing is done. Confirmation testing must be done by a procedure that is chemically different than the original assay and must have a greater level of sensitivity and specificity for the target drug(s) so that true positives are differentiated from false positives.

The following list shows some of the cross-reacting substances that we are aware of that could cause a false positive immunoassay test. This is by no means a complete list of all the potential substances that could act as a cross-reacting substance. If a substance is followed by a "?" we are suspicious that it may cross react, but are not sure. Many of the substances on the list will only interfere at high levels, so that not all people using these drugs will give a positive response. For instance, positive results from the use of over the counter drugs such as ephedrine, pseudoephedrine, or phenylpropanolamine in the amphetamine group immunoassay, may indicate a potential misuse/abuse situation because of the high levels of drug necessary to cause a positive reaction. Drug classes not listed, such as cocaine, could have false positive screening tests, but no specific substances have been identified as a cause for these occasional false positive results. NOTE: this information only applies to urine immunoassay testing. Results that have been confirmed by a chromatographic procedure such as GC/MS are not affected by these interferences.

Amphetamines:

Pseudoephedrine	ephedrine	phenylpropanolamine
phentermine (with fenfluramine)	ranitidine	trazadone
serazone	cimetidine?	Vicks® inhaler (see notes)
commercial adulterant products		

Opiates:

Cimetidine	ofloxacin	levofloxacin
ciprofloxacin	ranitidine	tramadol (Ultram®)
promethazine metabolites?	detergent?	amitriptyline and/or nortriptyline?
other tricyclics?	high levels of ephedrine/pseudoephedrine?	
commercial adulterant products?		

Barbiturates:

Primadone® (produces phenobarbital as a metabolite).

Benzodiazepines:

Oxaprozin (Daypro®)	diphenhydramine.	Zoloft®
---------------------	------------------	---------

Cannabinoids (THC):

Prilosec®	Protonix®	naproxen (Naprosyn®, Aleve®),
Sustiva® (questionable)	detergent	commercial adulterant products.

Phencyclidine (PCP):

Phenylpropanolamine	pseudoephedrine	dextromethorphan
Detergent	commercial adulterant products.	

Propoxyphene:

Methadone and metabolite (at high levels)

imiprimine (at high levels).

True positive results as confirmed by GC/MS may be due to legitimate prescription drug use, illicit prescription drug use or street drug use. Possible explanations for a GC/MS confirmed positive result include:

GC/MS RESULT	SOURCE
Amphetamine	Adderall®, Dexedrine®, DextroStat®
Methamphetamine	Street Drug, Didrex®, Desoxyn®, Eldapryl® (see notes)
Amphetamine and methamphetamine	Street Drug, Didrex®, Desoxyn®, Eldepryl® (see notes)
MDMA and/or MDA	Ecstasy
Barbiturate(s) identified	Prescription drug use (see notes)
Benzodiazepine(s) identified	Prescription drug use (see notes)
Cocaine metabolite	Cocaine
Ethanol	Alcoholic beverage (see notes)
Morphine (> 2000 ng/mL)	Heroin, MS Contin®, Duramorph®, Oramorph®, etc.
High Morphine w/small amt. of codeine and/or hydromorphone	Heroin
Codeine	Any product containing codeine such as Tylenol #3®, Phenergan w/Codeine, etc.
Codeine & Morphine in similar amts.	Same as for codeine
Hydrocodone	Any product containing hydrocodone such as Vicodin®, Hycodan®, Lortabs®, Norco®, etc
Hydrocodone & hydromorphone in similar amts.	Same as for hydrocodone.
Hydromorphone	Dilaudid® or hydrocodone if only in a small amt.
Oxycodone	Roxicet®, Oxycontin®, Endocet®, etc.
Phencyclidine	Phencyclidine (PCP)
THC	Marijuana, Marinol® (dronabinol)

Notes:

1. Methamphetamine – Vicks® inhalers sold in the US may trigger a positive immunoassay test that will confirm as methamphetamine by GC/MS. A special GC/MS test for specific isomeric forms of methamphetamine is available to differentiate positives due to use of the inhaler from positives due to street drug.
2. Barbiturates and benzodiazepines – consult laboratory for assistance in interpreting results.
3. Ethanol special case – diabetics may be spilling glucose in their urine. If they also have a yeast infection, the urine specimen can spontaneously ferment, producing a positive urine test. All positive Ethanol screens are checked for glucose to help interpret results.