

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE**

A. 510(k) Number:

K023617

B. Analyte:

2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine or EDDP a methadone metabolite

C. Type of Test:

Qualitative and Semi-quantitative immunoassay

D. Applicant:

Microgenics Corporation

E. Proprietary and Established Names:

DRI[®] Methadone Metabolite Enzyme Assay and DRI[®] Methadone Metabolite Urine Calibrators and Controls

F. Regulatory Information:

1. Regulation section:
21 CFR §862.3620, 21 CFR §862.3200 and 21 CFR §862.3280
2. Classification:
Class II
3. Product Code:
DJR, DLJ, and LAS
4. Panel:
Toxicology (91)

G. Intended Use:

1. Intended use(s):
Refer to Indications for use.
2. Indication(s) for use:
The Methadone Metabolite Immunoassay is intended to be used for the qualitative and semi-quantitative determination of the presence of Methadone Metabolite (2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine or EDDP) in human urine at cutoffs of 300 and 1000 ng/mL. The semi-quantitative range of the assay is 31-2000 ng/mL. The assay provides a simple and rapid analytical screening procedure to detect methadone metabolite in human urine.

3. Special condition for use statement(s):

The DRI[®] Methadone Metabolite Enzyme Assay provides only a preliminary analytical test result. A more specific alternative chemical method must be used in order to obtain a confirmed analytical result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method. Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used.

4. Special instrument Requirements:

Clinical chemistry analyzers capable of maintaining a constant temperature, pipetting samples, mixing reagents, measuring enzymatic rates at 340 nm and timing the reaction accurately can be used to perform this immunoassay. Equivalence was demonstrated using a Hitachi 717 analyzer.

H. Device Description:**I. Substantial Equivalence Information:**1. Predicate device name(s):

DRI[®] Methadone Metabolite Enzyme Assay

2. Predicate K number(s):

K931780

3. Comparison with predicate:

Similarities		
Item	Device	Predicate
Analyte	EDDP	EDDP
Matrix	Urine	Urine
Differences		
Item	Device	Predicate
Cutoff	300 and 1000 ng/mL	1000 ng/mL
Antibody	Mouse monoclonal anti-EDDP with better stability and performance characteristics	Monoclonal anti-EDDP

J. Standard/Guidance Document Referenced (if applicable):

Guidance for Prescription Use Drugs of Abuse Assays Premarket Notifications, published November 2000.

K. Test Principle:

The subject device, the DRI[®] Methadone Metabolite Enzyme Assay, is a ready-to-use, liquid homogeneous enzyme immunoassay. The assay uses specific antibodies that detect EDDP in human urine without cross-reactivity to the parent drug,

methadone. The assay is based on the competition between a drug labeled with glucose-6-phosphate dehydrogenase (G6PDH), and free drug from the urine sample for a fixed amount of specific antibody binding sites. In the absence of free drug from the sample, the specific antibody binds the drug labeled with G6PDH and causes a decrease in enzyme activity. This phenomenon creates a direct relationship between drug concentration in urine and the enzyme activity. The enzyme activity is determined spectrophotometrically at 340 nm by measuring its ability to convert nicotinamide adenine dinucleotide (NAD) to NADH.

L. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. *Precision/Reproducibility:*

Specimen description: Drug free urine spiked with EDDP.

Number of days: Ten

Replicates per day: 3 cups, 2 replicates, 2 runs per day for a total of 120 determinations

Lots of product used: not specified

Qualitative

300 ng/mL Cutoff (n=120)	Within Run			Total Run		
	Avg (mA/min)	SD	%CV	Avg (mA/min)	SD	%CV
Calibrator (150ng/mL)	287	2.6	0.9	287	2.7	0.9
Cutoff Calibrator (300ng/mL)	335	2.2	0.7	335	2.6	0.8
Calibrator (500 ng/mL)	383	2.7	0.7	383	3.1	0.8

1000 ng/mL Cutoff (n=120)	Within Run			Total Run		
	Avg (mA/min)	SD	%CV	Avg (mA/min)	SD	%CV
Negative Control (750 ng/mL)	426	2.7	0.6	426	3.1	0.7
Cutoff Calibrator (1000 ng/mL)	456	3.1	0.7	456	3.2	0.7
Positive Control (1250 ng/mL)	480	2.7	0.6	480	3.1	0.6

Semi-quantitative

300 ng/mL Cutoff (n=120)	Within Run			Total Run		
	Avg (ng/mL)	SD	%CV	Avg (mA/min)	SD	%CV
Calibrator (150ng/mL)	150	5.6	3.7	150	8.6	5.7
Cutoff Calibrator (300ng/mL)	300	7.1	2.4	300	9.4	3.1
Calibrator (500 ng/mL)	498	11.6	2.3	498	16.3	3.3

1000 ng/mL Cutoff (n=120)	Within Run			Total Run		
	Avg (ng/mL)	SD	%CV	Avg (mA/min)	SD	%CV
Negative Control (750 ng/mL)	763	19.7	2.6	763	22.1	2.9
Cutoff Calibrator (1000 ng/mL)	1016	23.6	2.3	1016	25.7	2.5
Positive Control (1250 ng/mL)	1270	34.7	2.7	1270	36.8	2.9

b. *Linearity/assay reportable range:*
31-2000 ng/mL

c. *Traceability (controls, calibrators, or method):*
Calibrators and controls are gravimetrically prepared and verified by GC/MS analysis. Stability studies were summarized for calibrators and controls.

d. *Detection limit:*
31- 2000 ng/mL

e. *Analytical specificity:*
Various common over-the-counter medications and structurally related compounds were tested for cross-reactivity in the assay using both 300 ng/mL and 1000 ng/mL EDDP as cutoff calibrators.

Compound	300 ng/mL Cutoff Concentration	1000 ng/mL Cutoff Concentration
Methadone	9,000,000	35,000,000
EMDP	200,000	200,000
LAAM-HCl	100,000	100,000
Nor-LAAM-HCl	100,000	100,000

Compound	Concentration (ng/mL)	Compound	Concentration (ng/mL)
Acetaminophen	1,000,000	Ibuprofen	500,000
Acetylsalicylic Acid	1,000,000	Ketamine	1,000,000
Amphetamine	1,000,000	Levothyroxine	500,000
Benzoylcegonine	1,000,000	Meperidine	1,000,000
Caffeine	100,000	d-Methamphetamine	100,000
Captopril	500,000	l-Methamphetamine	100,000
Chlorazepoxide	100,000	Morphine	1,000,000
Cimetidine	500,000	Oxazepam	500,000
Cocaine	200,000	Phencyclidine	500,000
Codeine	1,000,000	Phenobarbital	1,000,000
Dextromethorphan	300,000	Phentermine	1,000,000
Diazepam	100,000	Promethazine	100,000
Diphenhydramine	500,000	Propoxyphene	1,000,000

Compound	Concentration (ng/mL)	Compound	Concentration (ng/mL)
Disopyramide	1,000,000	Rantidine	500,000
Doxylamine	500,000	Salicycluric Acid	500,000
Ephedrine	1,000,000	Secobarbital	1,000,000
Fluoxetine	500,000	11-Nor- Δ^9 -THC-9-COOH	10,000

f. Assay cut-off:
300 and 1000 ng/mL.

2. Comparison studies:

a. *Method comparison with predicate device:*

For the qualitative and semi-quantitative assays at 300 and 1000 ng/mL cutoff, a total of 150 clinical specimens obtained from patients receiving methadone treatment were tested using the DRI Methadone Metabolite Assay and GC/MS.

Qualitative:

		Subject Device 300 ng/mL Cutoff	
		Pos	Neg
GC/MS 300 ng/mL Cutoff	Pos	71	2
	Neg	0	77

		Subject Device 1000 ng/mL Cutoff	
		Pos	Neg
GC/MS 1000 ng/mL Cutoff	Pos	69	5
	Neg	0	76

Semi-quantitative:

		Subject Device 300 ng/mL Cutoff	
		Pos	Neg
GC/MS 300 ng/mL Cutoff	Pos	71	2
	Neg	0	77

		Subject Device 1000 ng/mL Cutoff	
		Pos	Neg
GC/MS 1000 ng/mL Cutoff	Pos	69	7
	Neg	1	73

b. Matrix comparison:

Not Applicable. The assay is intended for only one sample matrix.

3. Clinical studies:

a. Clinical sensitivity:

Not applicable. Clinical studies are not typically submitted for this device type.

b. Clinical specificity:

Not applicable. Clinical studies are not typically submitted for this device type.

c. Other clinical supportive data (when a and b are not applicable):

4. Clinical cut-off:

Not applicable

5. Expected values/Reference range:

Not applicable

M. Conclusion:

Based upon the information provided, I recommend that the DRI[®] Methadone Metabolite Enzyme Assay and the DRI[®] Methadone Metabolite Urine Calibrators and Controls be found substantially equivalent to predicate devices according to 21 CFR §862.3620, 21 CFR §862.3200 and 21 CFR §862.3280.