APR 3 2000

K993208

PREMARKET NOTIFICATION
510(k) SUMMARY
(As Required By 21 CFR 807.92)

807.92 (a):

1. *Submitter's Name:* STC Technologies, Inc.
   Address: 1745 Eaton Avenue, Bethlehem, PA 18018
   Telephone Number: (610) 882-1820
   Contact Person: R. Sam Niedbala, Ph.D., BCFE
   Date Prepared: 02/10/00

2. *Device Name:*
   Proprietary Name: Methamphetamine Intercept™ MICRO-PLATE EIA
   Usual Name: Methamphetamine Intercept™ System
   Classification Name: Enzyme Immunoassay, Amphetamines

3. *Device to Which Substantial Equivalence Is Claimed:*
   Roche Diagnostic Systems, Abuscreen ONLINE® kit for amphetamines (urine); K933052

4. *Description of Device:*

Principle of the Assay

The STC Methamphetamine Intercept™ MICRO-PLATE EIA is a competitive micro-plate immunoassay for the detection of methamphetamine in oral fluid collected with the Intercept™ DOA Oral Specimen Collection Device. Specimen or standard is added to an EIA well in combination with an enzyme-labeled hapten derivative. In an EIA well containing an oral fluid specimen positive for methamphetamine, there is a competition between the drug and the enzyme-labeled hapten to bind the antibody fixed onto the EIA well. EIA wells are then washed, substrate is added, and color is produced. The absorbance measured for each well at 450 nm is inversely proportional to the amount of methamphetamine present in the specimen or calibrator/control. Because currently there are no SAMHSA assigned cutoffs for methamphetamine testing using oral fluid, STC recommends a cutoff of 40 ng/mL when testing oral fluid collected with the Intercept™ DOA Oral Specimen Collection Device. This cutoff is within the limit of detection by the STC Methamphetamine Intercept™ MICRO-PLATE EIA.

KIT COMPONENTS
Anti-Methamphetamine Coated Plate -- Rabbit anti-methamphetamine polyclonal antibody immobilized on a polystyrene plate supplied in dry form.
Methamphetamine Enzyme Conjugate -- Horseradish peroxidase labeled with a methamphetamine hapten diluted in a protein matrix of bovine serum with protein stabilizers.
Substrate Reagent -- One bottle containing 3,3', 5,5' tetramethylbenzidine.
Stopping Reagent -- Each bottle contains 2 N sulfuric acid.
Oral Fluid Negative Calibrator --Oral Fluid Diluent negative for methamphetamine.
Oral Fluid Negative Control -- Oral Fluid Diluent containing 20 ng/mL (v/v) methamphetamine.
Oral Fluid Cutoff Calibrator --Oral Fluid Diluent containing 40 ng/mL (v/v) methamphetamine.
Oral Fluid Positive Control – Oral Fluid Diluent containing 80 ng/mL (v/v) methamphetamine.

Principle of the Intercept™ DOA Oral Specimen Collection Device

Saliva is a complex mixture of parotid, submandibular, sublingual and minor salivary gland secretions mixed with mucin, bacteria, leukocytes, sloughed epithelial cells and gingival crevicular fluid. The fact that methamphetamine is present in oral fluid following human use is well documented.

The Intercept™ DOA Oral Fluid Collection Device was developed for the purpose of collecting oral fluid for diagnostic testing. The collection device consists of a treated absorbent cotton fiber pad affixed to a nylon stick (Collection Pad) and a preservative solution in a plastic container (Specimen Vial). The Collection Pad is impregnated with a mixture of common salts and gelatin which creates a hypertonic environment and an increased osmotic pressure wherever it contacts oral mucosal cells. The pad is placed in contact with the gingival mucosa (between the lower gum and cheek) which enhances the flow of mucosal transudate across the mucosal surfaces onto the absorptive cotton fibers of the pad. Following the collection period, the Collection Pad is placed into a vial containing a preservative solution which serves to inhibit the growth of oral micro-organisms recovered on the Collection Pad. The vial is sealed with a plastic cap and transported to a laboratory for processing and testing. Following processing, a fluid containing a mixture of saliva components and the preservative solution is recovered which is suitable for testing for the presence of methamphetamine in the Methamphetamine Intercept™ MICRO-PLATE EIA manufactured by STC Technologies, Bethlehem, PA. Refer to the Intercept™ DOA Oral Specimen Collection Device product insert for specific instructions on the proper collection, handling, and adequacy of oral fluid samples.

5. *Intended Use Statement:*
The STC Methamphetamine Intercept™ MICRO-PLATE EIA is intended for use by clinical laboratories in the qualitative determination of methamphetamine in oral fluid collected with the Intercept™ DOA Oral Specimen Collection Device. **For *In Vitro* Diagnostic Use.**

6. *Summary of Technological Characteristics:*
The STC Methamphetamine Intercept™ MICRO-PLATE EIA is based on the principle of solid phase competitive enzyme immunoassay . This application is for the use of the STC Methamphetamine EIA as a screening tool for the detection of methamphetamine using specimens collected with the Intercept™ DOA Oral Specimen Collection Device manufactured by Epitope, Inc., Beaverton, Oregon.

807.92 (b):

1. *Non Clinical Data:*
Analytical Sensitivity/Limit Of Detection - The Limit of Detection (LOD) was defined from the signal-to-noise ratio at the zero-drug concentration as the mean zero absorbance (A_0) minus the noise times three (LOD = A_0 - 3SD). The LOD was determined by obtaining the average absorbance value for 80 readings of Oral Fluid Diluent and calculating the standard deviation (SD) and 3SD of the absorbance. The absorbance value minus 3SD was then extrapolated from the curve and represents the sensitivity of the assay. The LOD was calculated to be 8.0 ng/mL.

Precision - The precision of the STC Methamphetamine Intercept™ MICRO-PLATE EIA was assessed by testing Oral Fluid Diluent containing 0, 20, 40, 60 and 80 ng/mL methamphetamine. The intra-assay precision was determined by analyzing each level 16 times per run for 4 runs. Inter-assay precision was determined by analyzing 2 samples at each level twice per day for 20 days. The results of this testing are described in the following table:

METHAMPHETAMINE (ng/mL)	MEAN (OD)	INTRA-ASSAY %CV (n=64)	INTER-ASSAY %CV (n=4/day, 20 days)
0	2.056	7.8	7.5
20	0.978	7.0	7.7
40	0.710	6.2	7.9
60	0.554	7.8	7.5
80	0.480	6.4	8.4

Analytical Specificity/Cross-Reactivity - The analytical specificity of an immunoassay is defined as the cross-reactivity of substances in the assay which are structurally related to the target compound. The percent cross-reactivity of a compound in the STC Methamphetamine Intercept™ MICRO-

PLATE EIA is defined as the apparent methamphetamine concentration divided by the spiked concentration times 100.

The cross-reactivities of structurally related compounds were calculated at several spiked concentrations in Oral Fluid Diluent. The following table indicates the apparent concentration of methamphetamine for each substance at a concentration which cross-reacted in the assay. Note: D-Methamphetamine was used as the kit standard and, therefore, will exhibit 100% cross-reactivity.

Compound	Tested Concentration (ng/mL)	Methamphetamine Equivalent (ng/mL)	Cross-Reactivity (%)
β-Phenethylamine	10,000	7.995	0.080
Diphenhydramine	10,000	6.503	0.065
D-Amphetamine	5,000	32.160	0.643
Fenfluramine	100	25.917	25.917
Isoxsuprine	10,000	5.994	0.060
l-Ephedrine	2,500	19.292	0.772
l-Methamphetamine	1,000	2.839	0.284
l-Phenylalanine	10,000	5.343	0.053
MDA	5,000	33.817	0.676
MDMA	12.5	36.059	288.471
Mephentermine	2,500	31.361	1.254
Phentermine	10,000	15.935	0.159
Phenylephrine	10,000	13.299	0.133
Phenylpropanolamine	10,000	9.790	0.098
Procaine	10,000	9.917	0.099
Pseudoephedrine	5,000	28.748	0.575

*out of range: not detectable

The user should be aware that the determination of methamphetamine equivalents for each compound is only to calculate the % cross-reactivity of these compounds in the assay. For many of these compounds, the absorbance readings obtained were below the limit of detection of 8.0 ng/mL for the assay. As a result, the % cross-reactivities for these compounds at the levels tested are considered estimates only.

The following compounds were spiked into Oral Fluid Control Matrix at a target concentration of 10,000 ng/mL and tested for cross-reactivity. None were found to produce a signal less than or equal to that of the Oral Fluid Cutoff Calibrator.

Acetylsalicylic Acid	Cocaethylene	Ibuprofen	Nordiazepam
Alprazolam	Cocaine	Imipramine	Penicillin
Amobarbital	Codeine	Lidocaine	Pentobarbital
Ampicillin	Cotinine	Medazepam	Phencyclidine
Benzoylecgonine	Dextromethorphan	Meperidine	Phenobarbital
Butabarbital	Diacetylmorphine	Methadone	Procainamide
Butalbital	Fenoprofen	Metroprolol	Quinidine
Caffeine	Gemfibrozil	Morphine	Temazepam
Chlordiazepoxide	Gentisic Acid	Nalorphine	Theophylline
Chlorpromazine	Glipizide	Naproxen	Δ^9-THC
Clonazepam	Hydrocodone	Niacinamide	Zomepirac
Clorazepate	Hydromorphone	Norchlordiazepoxide	

It is possible that other substances and/or factors not listed above may interfere with the test and cause false results, e.g., technical or procedural errors.

2. *Clinical Data*:

A total of 80 matching oral fluid and urine specimens were collected from known or suspected drug abusers. An additional six (6) random oral fluid samples were screened and confirmed for the presence of methamphetamine. All oral fluid specimens were tested using the STC Methamphetamine Intercept™ MICRO-PLATE EIA. All samples that tested positive and 20 samples

that tested negative by EIA were confirmed by GC/MS. All urine samples were screened using a commercial immunoassay kit for amphetamines. Positive samples were confirmed using GC/MS.

For oral fluid testing, a 40 ng/mL cutoff was used for EIA and GC/MS. For urine testing, the cutoffs were 1,000 ng/mL and 500 ng/mL respectively, for the initial screen and GC/MS confirmation based on SAMHSA guidelines.[1] The % agreement of the STC EIA results to the urine EIA and GC/MS results are shown below:

		Urine Assay (1000 ng/mL Cutoff)	
		+	-
STC Oral Fluid EIA (40 ng/mL Cutoff)	+	20	2
	-	3	54

% Agreement = 94%

		Oral Fluid GC/MS (40 ng/mL Cutoff)	
		+	-
STC Oral Fluid EIA (40 ng/mL Cutoff)	+	24	1
	-	0	25

% Agreement = 98%

3. *Conclusions*:
A comparison of the performance data for the new device vs. the predicate device is given below:

1. **Limit of Detection**

Assay	LOD (ng/mL)
STC Methamphetamine MICRO-PLATE EIA	8.0 ng/mL
Roche Abuscreen ONLINE®	< 30 ng/mL

2. **Precision**

Assay	Intra-Assay % C.V. Range	Inter-Assay % C.V. Range
STC Methamphetamine MICRO-PLATE EIA	6.2 - 7.8	7.5 - 8.4
Roche Abuscreen ONLINE®	3 - 6	4 - 7

3. **Sample pH Effect**

Assay	pH Effect
STC Methamphetamine MICRO-PLATE EIA	False positives at pH ≤ 6.0
Roche Abuscreen ONLINE®	Not Tested

4. **Effect of Common Materials**

Assay	Adulterants Which Affect Assay
STC Methamphetamine MICRO-PLATE EIA	Orange Juice (pH effect) Cough Syrup (Pseudoephedrine) Antiseptic (pH effect)
Roche Abuscreen ONLINE®	Not Tested

5. **Cross-Reactivity**

Compound	% Cross Reactivity	
	Oral Fluid	Urine
β-Phenethylamine	0.080	2
3-Hydroxytyramine	Not Tested	<0.2
d,l-Ephedrine	Not Tested	<0.2
d,l-Methamphetamine	Not Tested	0.2
d-Ephedrine	Not Tested	<0.2
d-Methamphetamine	100	0.5
d-Phenylpropanolamine	Not Tested	0.2
d-Pseudoephedrine	Not Tested	<0.2
Diphenhydramine	0.065	Not Tested
dl-Amphetamine	Not Tested	51
Fenfluramine	25.917	Not Tested
Isoxsuprine	0.060	Not Tested
l-Amphetamine	Not Tested	2
l-Ephedrine	0.772	<0.2
l-Methamphetamine	0.284	0.2
l-Norpseudoephedrine	Not Tested	<0.2
l-Phenylalanine	0.053	Not Tested
l-Phenylpropanolamine	Not Tested	1
l-Pseudoephedrine	Not Tested	<0.2
MDA	0.676	32
MDMA	288.471	0.2
Mephentermine	1.254	<0.2
p-Hydroxyamphetamine	Not Tested	14
p-Hydroxymethamphetamine	Not Tested	0.3
Phendimetrazine	Not Tested	<0.1
Phentermine	0.159	<0.1
Phenylephrine	0.133	Not Tested
Phenylpropanolamine	0.098	0.7
Procaine	0.099	Not Tested
Propylhexidine	Not Tested	0.5
Pseudoephedrine	0.575	Not Tested
Tyramine	Not Tested	0.3

6. References

(1) "Urine Testing for Drugs of Abuse", National Institute on Drug Abuse (NIDA), Research Monograph 73, 1986.

R. Sam Niedbala, Ph.D., BCFE
Chief Science Officer

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
9200 Corporate Boulevard
Rockville MD 20850

APR 3 2000

R. Sam Niedbala, Ph.D., BCFE
Executive Vice President
STC Technologies, Inc.
1745 Eaton Avenue
Bethlehem, Pennsylvania 18018-1799

Re: K993208
Trade Name: STC Methamphetamine-Intercept™ MICRO-PLATE EIA
Regulatory Class: II
Product Code: LAF
Dated: February 11, 2000
Received: February 16, 2000

Dear Dr. Niedbala:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its internet address "http://www.fda.gov/cdrh/dsma/dsmamain.html".

Sincerely yours,

Steven Gutman

Steven I. Gutman, M.D., M.B.A.
Director
Division of Clinical Laboratory Devices
Office of Device Evaluation
Center for Devices and Radiological Health

Enclosure

STATEMENT OF INDICATIONS FOR USE

510(k) Number (if known): K993208

Device Name: STC Methamphetamine Intercept™ MICRO-PLATE EIA

Indications For Use: The STC Methamphetamine Intercept™ MICRO-PLATE EIA is intended for use in the qualitative determination of methamphetamine in oral fluid collected with the Intercept™ Drugs of Abuse (DOA) Oral Specimen Collection Device. For *In Vitro* Diagnostic Use.

Carol Cooper

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K993208

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use ✓ **OR** **Over-The-Counter Use** _____
(Per 21 CFR 801.109)