Syntron Bioresearch, Inc.

Saliva Screen 6 Test

REF 70604-B

Instructions IVD CE

INTENDED USE

The Syntron Saliva Screen 6 Test is an immunochromatographic assay for rapid, qualitative detection of six drugs and their principal metabolites in human saliva at specified cut-off concentrations. A 6-drug combination is composed of the following drugs:

DRUG CLASS		SENSITIVITY
BENZODIAZEPINE	BZD	50 ng/ml
COCAINE/BENZOYLECGONINE	COC	30 ng/ml
MARIJUANA	THC	20 ng/ml
METHAMPHETAMINE	MET	50 ng/ml
OPIATES/MORPHINE	OPI/MOR	30 ng/ml
PHENCYCLIDINE	PCP	15 ng/ml

Note: The test provides only preliminary data which should be confirmed by other methods such as gas chromatography/mass spectrometry (GC/MS). Clinical considerations and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are indicated.

SUMMARY AND EXPLANATION OF THE TEST

The Syntron Saliva Screen 6 Test is an easy, fast, qualitative, visually read competitive binding immunoassay method for screening human saliva. The method employs unique mixture of monoclonal and polyclonal antibodies to selectively identify the drugs of abuse and their metabolites in test samples with a high degree of sensitivity.

Drug abuse remains a growing social and economical concern in many developed and developing countries throughout the world. The above stated drugs are among the most frequently abused illicit drugs, according to the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA). There is a growing interest in the use of alternate human sampling other than urine, for the diagnosis of drugs of abuse.

PRINCIPLE OF THE TEST

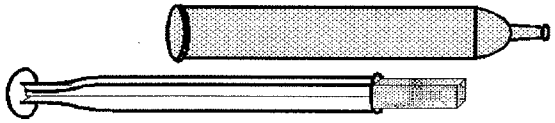
The Syntron Saliva Screen 6 Test is a competitive binding immunoassay in which drug and drug metabolites in a saliva sample compete with immobilized drug conjugate for limited labeled antibody binding sites. By utilizing antibodies that are specific to different drug classes, the test permits independent, simultaneous detection of five drugs from a single sample. The approximate run time is 10 minutes.

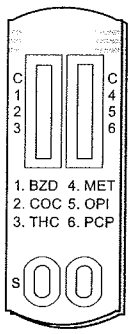
In the assay procedure, the saliva mixes with labeled antibody-dye conjugate and migrates along a porous membrane. When the concentration of a given drug is below the detection limit of the test, unbound antibody-dye conjugate binds to antigen conjugate immobilized on the membrane, producing a rose-pink color band in the appropriate Test Zone for that drug. Conversely, when the drug level is at or above the detection limit, free drug competes with the immobilized antigen conjugate on the membrane by binding to antibody-dye conjugate, forming an antigen- antibody complex, preventing the development of a rose-pink color band.

Regardless of the drug levels in the sample, a rose-pink color band is produced in each Control Zone (marked "C") by a parallel immunochemical reaction. These bands serve as built-in quality control measures by demonstrating antibody recognition, verifying that the reagents are chemically active.

REAGENTS AND MATERIALS PROVIDED

1. Test Devices. Contains dye-conjugated antibody and immobilized antigen in protein matrix with sodium azide.
2. Saliva Collection System – Plastic Tube & Saliva Swab. REF SYR-001
3. Test Instructions REF PI-70604-B





4. Extraction Buffer. REF *4010N*

MATERIALS REQUIRED BUT NOT PROVIDED

1. Clock or timer.

STORAGE AND STABILITY

Store test kit below 28°C; **do not freeze**. Refer to the expiration date for stability.

WARNINGS AND PRECAUTIONS

1. **For *forensic* use only.**
2. Do not use the test device beyond the expiration date.
3. Saliva specimens may be infectious; properly handle and dispose of all used reaction devices in a biohazard container.
4. Visually inspect the foil package to insure it is intact. If the package is not intact, do not use the device – the integrity of the device might be compromised.

IMPORTANT NOTES:

1. Bring test pouch to room temperature (15°-28°C).
2. Do not break the seal of the pouch until ready to begin testing.
3. The Saliva Collection System is a *one time use only* system. To avoid cross-contamination, use a new Saliva Collection System for each saliva sample.
3. Make sure that there is sufficient saliva in the test (3 drops). Do not spit directly on the device. The Saliva Swab must be used to collect sample in order for the device to function correctly.
4. The result must be interpreted at 10 minutes. Waiting more than 10 minutes may cause the reading to be inaccurate. Discard used test device after interpreting the results to avoid confusion.

PATIENT SAMPLING AND TEST PROCEDURE

1. Adulterated saliva could give a false result. **Make sure that there is nothing in the patient's mouth for at least 5 minutes.**

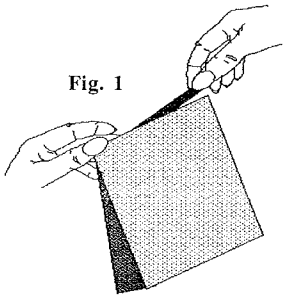


Fig. 1

2. Remove the Saliva Collection System out of the pouch, making sure not to contaminate the device. **Fig.1.**
Note: If it is your protocol to ID the device, write the patient's ID directly on the device

3. Place foam end of the syringe plunger into the patient's mouth and gently move it for up to 2 minutes to let the sufficient saliva collect in the foam. **Fig. 2**
(NOTE: Have the patient pucker their mouth to get enough oral fluid.)

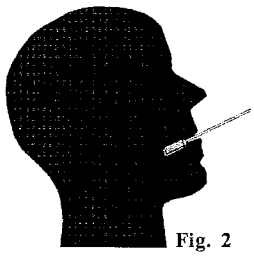


Fig. 2

4. Remove the Saliva Swab out of the patient's mouth and place it inside the syringe tube.

5. Place 1 drop of saliva extraction buffer into each well *4010N*. Wait for each drop to be completely absorbed. **Fig. 3**

6. Carefully add 3 drops of saliva into each well. **Fig. 3**

7. Read the results at 10 minutes.

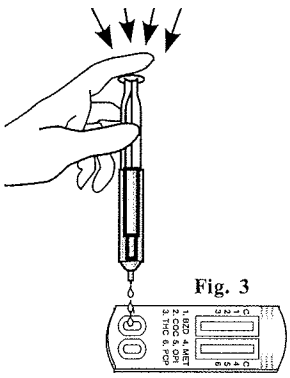


Fig. 3

Forensic Use Only

Syntron Bioresearch, Inc. • 2774 Loker Avenue West • Carlsbad, CA 92010 • USA
Emergo Europe • Molenstraat 15 2513 BH • The Hague • Netherlands +31.70.345.8570 EC REP

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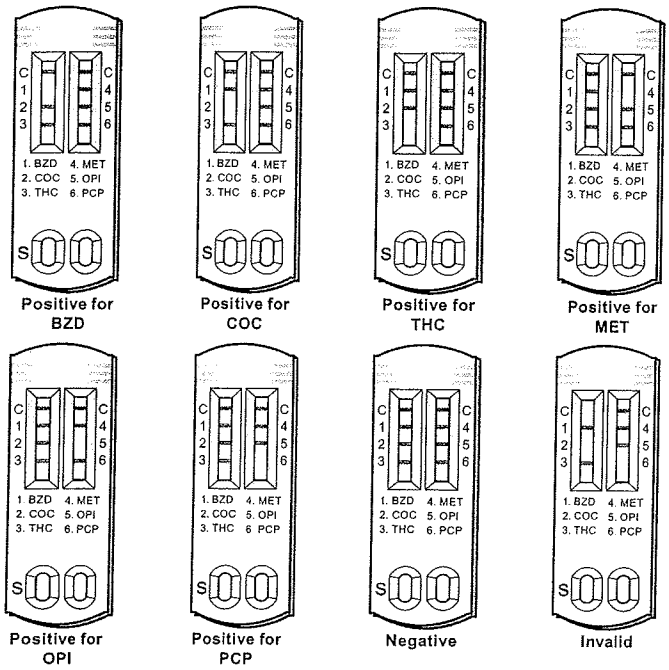
INTERPRETATION OF RESULTS

Important: Two control lines are necessary in order to validate test results. If a rose-pink color band fails to appear in one or both Control Zones ("C"), discard the cassette and retest the sample using a new device.



Positive: A *rose-pink* band is visible in each control zone. No color band appearing in the appropriate test zone indicates a positive result for the corresponding drug of that specific test zone.

Negative: A *rose-pink* band is visible in each control zone and the appropriate test zone, indicates that the concentration of the corresponding drug in that specific test zone is below the detection limit of the test.

Invalid: If a color band is not visible in either or both control zones, the test is invalid. Another test should be run to reevaluate the specimen.

Note: There is no meaning attributed to line color intensity or width.

QUALITY CONTROL

An internal procedure control has been incorporated into the test to ensure proper kit performance and reliability.

The use of an external control is recommended to verify proper kit performance. Quality control samples should be tested according to quality control requirements established by the testing laboratory.

PERFORMANCE CHARACTERISTICS

1. **Sensitivity**. The Syntron Saliva Screen 6 Test detects drugs of abuse and their major metabolites in saliva at concentrations equal to or greater than the cut-off level for the specific drug, which is suggested by SAMHSA and the U.S. Department of Health and Human Service for the Immunoassay method.
2. **Specificity**. A Study was conducted with the Syntron Saliva Screen 6 Test to determine the cross-reactivity of drug-related compounds with the test. Substances listed in **Table I** produced results approximately equivalent to the cut-off levels. A separate study was conducted to determine the cross-reactivity of non-related compounds with the test at concentrations much higher than normally found in the saliva of people using or abusing them. No cross reactivity was detected with the substances listed in **Table II**.

Table I: Concentrations of drug-related compounds showing positive response approximately equivalent to the cut-off set for the test:

The following Benzodiazepine-related substances yield positive results for Benzodiazepine at 50 cut-off:

Oxazepam	*50 ng/ml*
Flurazepam	*50 ng/ml*
Nitrazepam	*50 ng/ml*
Clonazepam	*50 ng/ml*
Temazepam	*10 ng/ml*
Diazepam	*5 ng/ml*
Triazolam	*100 ng/ml*
Timezapam	*200 ng/ml*
Lorazepam	*200 ng/ml*
Prazepam	*100 µg/ml*

The following Cocaine-related substances yield positive results for Cocaine at 30 ng/ml cut-off:

Benzoylecgonie	*30 ng/ml*
Cocaine	*30 ng/ml*
Pseudoephedrine	*5 mg/ml*
Ephedrine	*5 mg/ml*
2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine	*0.5 mg/ml*

The following Marijuana-related substances yield positive results for Marijuana at 20 ng/ml cut-off:

11-Nor-D8-THC-9-COOH	*20 ng.ml*
11-Nor-D9-THC-9-COOH	*20 ng/ml*
D9-THC	*20 mg/ml*
D8-THC	*100 mg/ml*

The following Methamphetamine-related substances yield positive results for Methamphetamine at 50 ng/ml cut-off:

+ Methamphetamine	*50 ng/ml*
3,4-Methylenedioxymethamphetamine	*50 ng/ml*
d-Amphetamine	*10000 ng/ml*
d,l-Amphetamine	*10000 ng/ml*
Pseudoephedrine	*250 ng/ml*
Ephedrine	*100 µg/ml*
(±) 3,4-Methylenedioxyamphetamine	*10000 ng/ml*

The following Opiates-related substances yield positive results for Opiates at 30 ng/ml cut-off:

Morphine	*30 ng/ml*
Morphine-3-b-D-Glucuromide	*30ng/ml*
Codeine	*30ng/ml*
Heroin	*30ng/ml*
Hydromorphine	*5000ng/ml*
Norcodeine	*5000ng/ml*
Oxycodone	*5000ng/ml*
Ephedrine	*2mg/ml*
Pseudoephedrine	*5mg/ml*

The following Phencyclidine (PCP)-related substances yield positive results for PCP at 15 ng/ml Cut-Off:

n-Acetylprocainamide	*10,000 ng/ml*
Codeine	*5,000 ng/ml*
p-Hydroxymethamphetamine	*50,000 ng/ml*
Thebaine	*10,000 ng/ml*
1-(1-Phenylcyclohexyl)morphine	*600 ng/ml*
N,N-Diethyl-1-phenyl-cyclohexylamine	*2.0 ng/ml*
1-[1-(2-Thienyl)cyclohexyl]morphine	*200 ng/ml*

Table II: Compounds tested and found not to cross-react with the test at a 100 ng/ml concentration:

The following compounds do not cross-react with Benzodiazepine:

Acetaminophen
Acetylsalicylic Acid
Amikicin
Amitryptyline
Ampicillin
Ampicillin
Arternol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine HCl
Caffein
Chlorpheniramine
Chlorpromazine HCl
Cimetidine
Codeine
Deoxyethedrine
Diazepam
Dietylpropoin
Diphenylhydantoin
Ecgonine HCl
Ecgonine Methyl Ester
Glucose
Histamine
Hydrocodone
Hydromorphone
Indomathacin
Ketoprofen
Levorphanol
D-9-THC
11-nor-D-9--carboxy-THC-9-COOH
Meperidine
Methylphenidate
Methaqualone
Morp. Glucuronide
Morphine Sulfate
Oxazepam
Oxycodone
Pendimetrazine
Penicillin G
Pentobarbital
d-Propoxyphene Hydrochlorthiazide
Proponal
Phencyclidine
Phenobarbital
Phentermine
Phenylpropanolamine
L-Phenlynephrine
Quinine
Ranitidine
Sodium Salicylate
Tryptophan
Tetracycline
Tetrahydrozoline
Theophylline
Thiroidazine
Trifluoperazine

The following compounds do not cross-react with Cocaine:

Acetaminophen
Acetylsalicylic Acid
Amikacin
Amitriptyline
Ampicillin
Arterenol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine HCl
Caffeine
Chlorpheniramine
Chlorpromazine HCl
Cimetidine
Codeine
Deoxyephedrine
Dextromethorphan
Diazepam
Hydromorphone
Indomethacin
Ketoprofen
Levorphanol
D -9-THC
Diethylpropion
Diphenylhydantoin
Doxylamine
Ecgonine HCl
Ecgonine Methyl Ester
Glucose
Histamine
Hydrocodone
11-nor-D -9-carboxy-THC-9-COOH
Meperidine
Methylphenidate
Methadone
Methaqualone
Morphine. Glucuronide
Morphine Sulfate
Oxazepam
Oxycodone
Pendimetrazine
Penicillin G
Pentobarbital
d-Propoxyphene Hydrochlorothiazide
Propanol
Phencyclidine
Phenobarbital
Phentermine
Phenylpropanolamine
L-Phenylephrine
Quinine
RanitidineSodium Salicylate
Tryptophan
Tetrahydrozoline
Theophylline
Thioridazine
Trifluoperazine

The following compounds do not cross-react with Marijuana:

Acetaminophen
Acetylsalicylic Acid
Amikacin
Ampicillin
Arterenol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine HCl
Caffeine
Chlorpheniramine
Chlorpromazine HCl
Cimetidine
Codeine
Deoxyephedrine
Dextromethorphan
Diazepam
Diethylpropion
Diphenylhydantoin
Doxylamine
Ecgonine HCl
Ecgonine Methyl Ester
Glucose
Histamine
Hydrocodone
Hydromorphone
Indomethacin
Ketoprofen
11-nor-Δ-9-carboxy-THC-9-COOH
Meperidine
Methylphenidate
Methadone
Methaqualone
Morphine. Glucuronide
Morphine Sulfate
Oxazepam
Oxycodone
Pendimetrazine
Penicillin G
Pentobarbital
L-Phenylephrine
Quinine
Ranitidine
Sodium Salicylate
Tryptophan
Tetracycline
Tetrahydrozoline
Theophylline
Thioridazine
Trifluoperazined-Propoxyphene
Hydrochlorothiazide
Propanol
Phencyclidine
Phenobarbital
Phentermine

The following compounds do not cross-react with Methamphetamine:

Acetaminophen
Acetylsalicylic Acid
Amikacin
Ampicillin
Arterenol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine HCl
Caffeine
Chlorpheniramine
Chlorpromazine HCl
Cimetidine
Codeine
Deoxyephedrine
Dextromethorphan
Diazepam
Diethylpropion
Diphenylhydantoin
Doxylamine
Ecgonine HCl
Ecgonine Methyl Ester
Glucose
Histamine
Hydrocodone
Hydromorphone
Indomethacin
Ketoprofen
LevorphanolD -9-THC
11-nor-D-9-carboxy-THC-9-COOH
Meperidine
Methylphenidate
Methadone
Methaqualone
Morphine. Glucuronide
Morphine Sulfate
Oxazepam
Oxycodone
Pendimetrazine
Penicillin G
Pentobarbital
L-Phenylephrine
Quinine
Ranitidine
Sodium Salicylate
Tryptophan
Tetracycline
Tetrahydrozoline
Theophylline
Thioridazine
Trifluoperazined-Propoxyphene
Hydrochlorothiazide
Propanol
Phencyclidine
Phenobarbital
Phentermine

The following compounds do not cross-react with Opiates:

Acetaminophen
Acetylsalicylic Acid
Amikacin
Amitriptyline
Ampicillin
Arterenol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine HCl
Caffeine
Chlorpheniramine
Chlorpromazine HCl
Cimetidine
Deoxyephedrine
Dextromethorphan
Diazepam
Diethylpropion
Diphenylhydantoin
Doxylamine
Ecgonine HCl
Ecgonine Methyl Ester
Glucose
Histamine
Indomethacin
Ketoprofen
Levorphanol
Δ - 9 THC
11-nor-Δ-9-carboxy-THC-9-COOH
Methylphenidate
Methadone
Methaqualone
Oxazepam
Pendimetrazine
Penicillin G
Pentobarbital
d-Propoxyphene-Hydrochlorothiazide
Propanol
Phencyclidine
Phenobarbital
Phentermine
Phenylpropanolamine
L-Phenylephrine
Quinine
Sodium Salicylate
Tryptophan
Tetracycline
Tetrahydrozoline
Theophylline
Thioridazine
Trifluoperazine

The following compounds do not cross-react with (15 ng/ml cut-off) Phencyclidine at a 100 mg/ml concentration:

Cimetidine
Deoxyephedrine
Dextromethorphan
Diazepam
Diethylpropion
5,5-Diphenylhydantoin
Acetaminophen
Acetylsalicylic Acid
Amikacin
Amitriptyline
Ampicillin
Arterenol
Aspartame
Atropine Sulfate
Benzoic Acid
Benzoylecgonine ·HCl
Caffeine
Chlorpheniramine
Chlorpromazine ·HCl
Doxylamine
Ecgonine ·HCl
Ecgonine Methyl Ester
Glucose
Histamine
Hydrocodone
Hydromorphone
Hydrochlorothiazide
Indomethacin
Ketoprofen
Levorphanol
Δ⁹-THC
11-Nor-Δ⁹-THC-9-COOH
Meperidine
Methylphenidate
Methadone
Methaqualone
Morphine-3-β-D-Glucuronide
Morphine Sulfate
Oxazepam
Oxycodone
Phendimetrazine
Penicillin G
d-Propoxyphene
1-Propanol
Phenobarbital
Phentermine
Phenylpropanolamine
l-Phenylephrine
Quinine
Ranitidine
Sodium Salicylate
Tryptophan
Tetracycline
Tetrahydrozoline
Theophylline
Thioridazine
Trifluoperazine

3. **Accuracy:** In order to show that the Syntron Saliva Screen 6 drug test is able to detect the presence of BZD, COC, MET, OPI, PCP and THC in saliva at or above the determined cut-off levels, the following tests were performed. Forty samples of drugs free saliva and urine for each were obtained from patients. The negative saliva samples were verified by urine from same patient using commercial urine drugs tests. The same saliva sample from each patient is aliquoted into three groups: Group A(Negative Control), Group B(spiked with 50% below the determined cut-off values of each drug by GC/MS) and Group C (Spiked with 50% above the determined cut-off values of each drug by GC/MS). The results are shown below:

	Spike at GC/MS value of	Saliva Screen Test Results	
Substance		NEGATIVE	POSITIVE
BZD	25 ng/ml	40	0
	75 ng/m	0	40
COC	15 ng/ml	40	0
	45 ng/m	0	40
MET	25 ng/ml	40	0
	75 ng/ml	0	40
OPI	15 ng/ml	40	0
	45 ng/ml	0	40
PCP	5ng/ml	40	0
	22.5ng/ml	0	40
THC	10 ng/ml	40	0
	30 ng/ml	0	40

When compared to GC/MS the relative sensitivity was 100%. The relative specificity was 100%.

BIBLIOGRAPHY

1. N. Samyn, C.V. Haeren, *Int. J. Legal Med.,* 113:150-154, 2000.
2. D.A. Kidwell, J.C. Holland, S. Athanaselis, *J. of Chromatography B*, 713:111-135, 1998.
3. S.G. Potsch L., *Int. J. Legal Med.,* 112-213-221, 1999.
4. Schramm W. Smith R.H., Craig P.A., Kidwell D.A., *J. of Anal. Toxicol.,* 16:19, 1992.
5. Cone E.J., *Ann. N.Y. Acad. Sci.*, 694-91-127, 1993.
6. Miller S.M., *Clin. Lab Sci.*, 7:39-44, 1994.

IVD = In-Vitro Diagnostic Device
EC REP = Authorized Rep in the EU Community
= Manufacturer