

Drugs of Abuse Detection: Parents, Children, and Home

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Northwest Toxicology

Salt Lake City, UT 84124

Phone: 801-293-2300

Objectives of Presentation

- Identify matrices for testing in children
 - Meconium, blood, hair, oral fluid, skin swipes, urine
- Interpretation of test results
- Mechanism involved in collection
- Laboratory processes in testing

Basics in Forensic Drug Testing

- Standard Operating Procedures
 - collection
 - chain of custody
 - transfer to and receipt by lab
 - screening for drugs
 - confirmation for drugs
- Quality Control

Drug and Integrity Tests in Urine

- Drugs
 - Amphetamines
 - Cocaine
 - Opiates
 - Marijuana
 - PCP
 - Numerous others depending on the situation
- Integrity Tests
 - Creatinine
 - pH (acidity)
 - Oxidants
 - Specific Gravity
- Follow-up/suspicion tests
 - Chromium
 - Soap, Bleach
 - Nitrites
 - Glutaraldehyde
 - Iodine, fluoride & others



FEDERAL DRUG TESTING CUSTODY AND CONTROL FORM

2008044

NORTHWEST DRUG TESTING
A DIVISION OF NBT, INC.
1101 EAST 9800 SOUTH, SUITE A-110
SALT LAKE CITY, UTAH 84124
(801) 283-0300 FAX (801) 283-9800

LABORATORY ACCESSION NO.

MPO Name, Address, Phone and Fax No.
**DR. CHRISTOPHER HOLLAND
CERTIFIED MEDICAL REVIEW OFFICER
C/O FEDERAL OCCUPATIONAL HEALTH
1150 BRAND AVENUE, SUITE 800
KANSAS CITY, MO 64106**

STEP 1: COMPLETED BY COLLECTOR OR EMPLOYED REPRESENTATIVE

A. Employer Name, Address, I.D. No.
UNIT OF NAVY
42237

B. Collector (MPO or Employee) I.D. No. 176-64-9027

C. Reason for Test: MTC, CDC, POF, OP, AMP Other (Specify)

D. Drug Test to be Performed: MTC, CDC, POF, OP, AMP Other (Specify)

E. Collection Site Address:
**KINGS BAY NAVAL SUB BASE
BLDG 1063
KINGS BAY, GEORGIA 31547**

F. Specimen Collection:
 Urine Saliva Other (Specify)

G. Responsible Subjunct/Cause: Post Accident Other (Specify)

Collector Phone No. (800) 488-7653
Collector Fax No. (757) 341-5899

REMARKS: ID IS, WKID.

STEP 2: COMPLETED BY COLLECTOR

Read Specimen Temperature within 4 minutes, to temperature between 50° and 100° F. Yes No. Enter Reason: 97

STEP 3: COLLECTOR AFFIXES SEAL TO BOTTLE(S). Donor initials (see): Donor completes STEP 5 on Copy 2 (MPO Copy)

STEP 4: CHAIN OF CUSTODY - INITIATED BY COLLECTOR AND COMPLETED BY LABORATORY

Signature of Collector: **JOSEPH C. REED** Date: **07.02.01**

SPECIMEN BOTTLE(S) RELEASED TO: **FED EX**

RECEIVED AT LAB:
 Primary Specimen Bottle Seal Intact No. Enter Remark Below

STEP 5a: PRIMARY SPECIMEN TEST RESULTS - COMPLETED BY PRIMARY LABORATORY

NEGATIVE POSITIVE for: MARIJUANA METABOLITE COCAINE METABOLITE PCP AMPHETAMINE METHAMPHETAMINE BACETYLMORPHINE

REMARKS:

TEST LAB (if different from above):
I certify that the specimen identified on this form was examined upon receipt, handled using chain of custody procedures, and

Signature of Certifying Officer: _____ Date: _____

STEP 5b: SPLIT SPECIMEN TEST RESULTS - (IF TESTED) COMPLETED BY SECONDARY LABORATORY

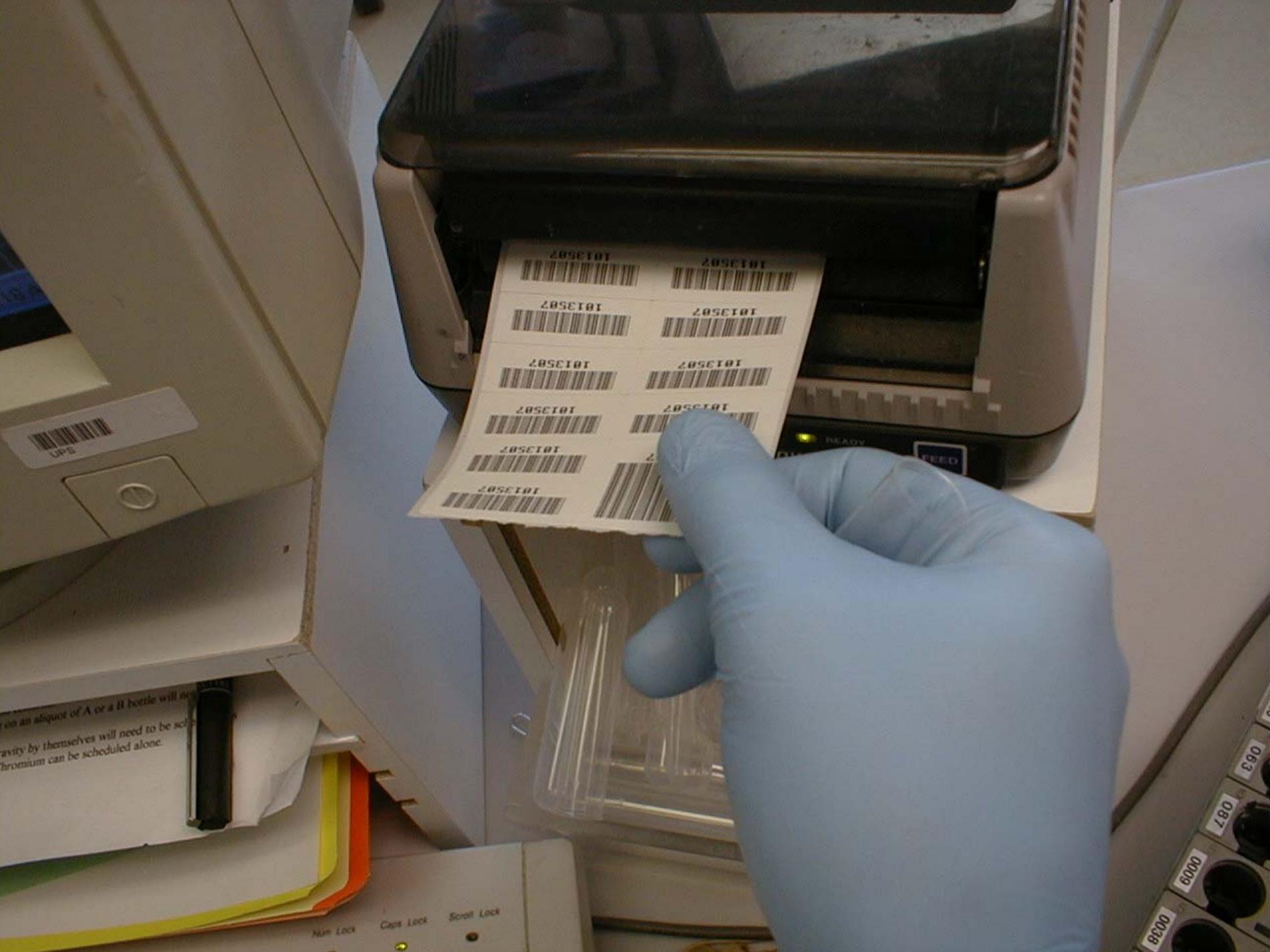
Laboratory Name: _____
Laboratory Address: _____
Signature of Certifying Officer: _____

PLACE OVER CAP

COPY 1 - ORIGINAL - MUST ACCOMPANY SPECIMEN TO LABORATORY



PRESS HARD - YOU ARE MAKING MULTIPLE COPIES



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activity by themselves will need to be sc
chromium can be scheduled alone.

Num Lock Caps Lock Scroll Lock

0038
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087
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FEDERAL DRUG TESTING A DIVISION OF FBI
 1141 EAST 3000 SOUTH, SUITE A-110
 SALT LAKE CITY, UTAH 84124
 (801) 226-2300 FAX (801) 226-2600

FEDERAL DRUG TESTING HISTORY AND CONTROL FORM

FEDERAL DRUG TESTING CUSTODY AND CONTROL FORM 2008044

LABORATORY ACCESSION NO. 11032310

CLIENT ACCOUNT NO. 11032310

CLIENT NAME

LOCATION CODE

STEP 1: COMPLETED BY COLLECTOR OR EMPLOYER REPRESENTATIVE

A. Employer Name, Address, I.D. No.
 U.S. DEPT. OF NAVY
 UIC: 40

B. MUD Name, Address, P.
 DELETED

C. Donor SOF or Employee L.
 El. Position, SSN

E. Drug Tests to be Performed

F. Collection Site Address
 KING'S BLDG
 KING

STEP 2: COMPLETED BY LABORATORY

Read Instructions

Between

REMOVED

STEP 3: COMPLETED BY LABORATORY

Specimen Bottles

Primary Specimen Bottle Seal Intact

Temporary Storage

ADULTERATED SUBSTITUTED AVAILABLE

COMPLETED BY PRIMARY LABORATORY

ADPH# Issued: METACOMPT#

Signature of Certifying System

SIGNATURE OF COLLECTOR

SIGNATURE OF EMPLOYER REPRESENTATIVE

SIGNATURE OF LABORATORY

SIGNATURE OF DONOR

SIGNATURE OF EMPLOYEE

SIGNATURE OF SUPERVISOR

SIGNATURE OF OFFICER

SIGNATURE OF AGENT

SIGNATURE OF SPECIAL AGENT

SIGNATURE OF SGT

SIGNATURE OF SERGEANT

SIGNATURE OF CAPTAIN

SIGNATURE OF MAJOR

SIGNATURE OF LIEUTENANT COLONEL

SIGNATURE OF COLONEL

SIGNATURE OF BRIGADIER GENERAL

SIGNATURE OF MAJOR GENERAL

SIGNATURE OF LIEUTENANT GENERAL

SIGNATURE OF GENERAL

SIGNATURE OF ADMIRAL

SIGNATURE OF VICE ADMIRAL

SIGNATURE OF REAR ADMIRAL

SIGNATURE OF CAPTAIN

SIGNATURE OF COMMANDER

SIGNATURE OF LIEUTENANT

SIGNATURE OF LIEUTENANT JUNIOR GRADE

SIGNATURE OF LIEUTENANT SENIOR GRADE

SIGNATURE OF ENSIGN

SIGNATURE OF JUNIOR GRADE

SIGNATURE OF SENIOR GRADE

SIGNATURE OF CHIEF WARRANT OFFICER

SIGNATURE OF WARRANT OFFICER

SIGNATURE OF FIRST CLASS WARRANT OFFICER

SIGNATURE OF SECOND CLASS WARRANT OFFICER

SIGNATURE OF THIRD CLASS WARRANT OFFICER

SIGNATURE OF FOURTH CLASS WARRANT OFFICER

SIGNATURE OF FIFTH CLASS WARRANT OFFICER

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SIGNATURE OF EIGHTEENTH CLASS WARRANT OFFICER

SIGNATURE OF NINETEENTH CLASS WARRANT OFFICER

SIGNATURE OF TWENTIETH CLASS WARRANT OFFICER

ORIGINAL - MUST ACCOMPANY SPECIMEN TO LABORATORY

COPY

11032310 SPECIMEN ID NO.

20-048 Rev. 10-99



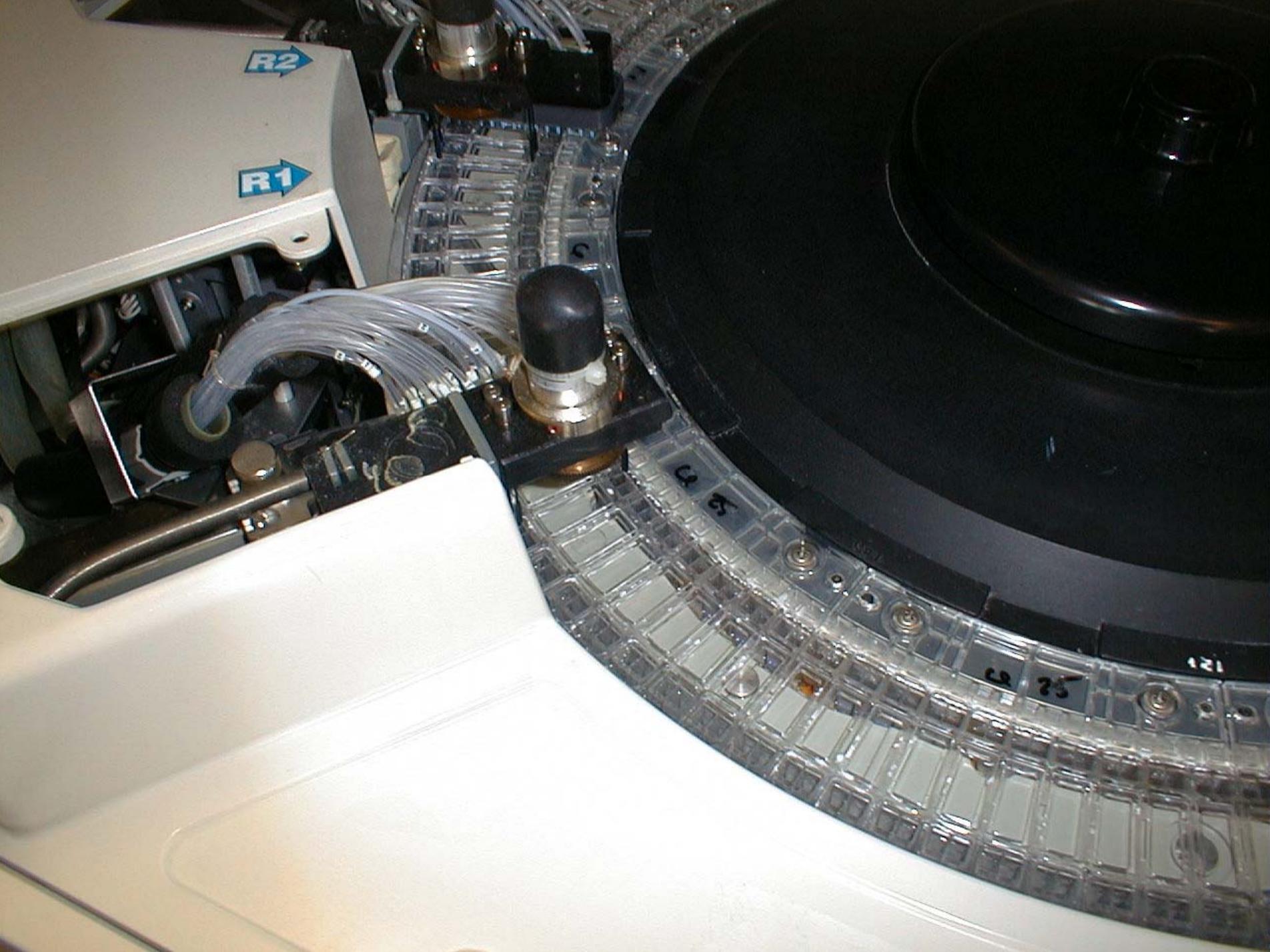


Initial Screening

- Often called the initial or immunoassay test
- All specimens are subjected to this test. It provides a rapid cost effective system to identify “presumptive positive” specimens
- This process requires 1 mL of urine to complete and will provide results for up to ten tests within 30 seconds
- Adulterants often target this process to change a positive screen to a negative test







Confirmation Testing

- The first step is to separate the drug from other components of the urine (2-4 hours)
- Completed by a technique known as gas chromatography/mass spectrometry (GC/MS)
- The GC further separates the remaining urine components
- The MS identifies each drug through a chemical fingerprint which is unique - the identification is conclusive

Hair Testing

- Drugs are primarily incorporated through the blood supply at the root end and are deposited during the hair shaft growth. Other drug incorporation mechanisms are sweat and scalp oils which soak into the hair shaft.
- Shampooing of the hair removes drug residue from the environment on a daily basis.
- Environmental contamination is also removed at the lab prior to testing for screening and confirmation with a methanol wash.

Drug Tests Available in Hair

- Amphetamines
 - Amphetamine & Methamphetamine
 - MDMA, MDA, MDEA
- Cocaine
 - Benzoylecgonine
 - Cocaine, Norcocaine, Cocaethylene
- Opiates
 - Codeine, Morphine, Heroin, 6-Acetylmorphine
 - Oxycodone, Oxymorphone, Hydrocodone, Hydromorphone
- Marijuana
 - 9-Carboxy THC, THC Parent
- PCP

Hair Collection Facts

- Workplace testing only involves the first 1.5 inches from the scalp and represents 90 days of exposure
- Normally takes 7-10 days for incorporated drugs to grow above the scalp
- Segmental analysis can provide time frames of drug use
- A full sample requires up to 200 strands of 1.5 inch long hair - shorter hair requires more strands

Hair Adulteration

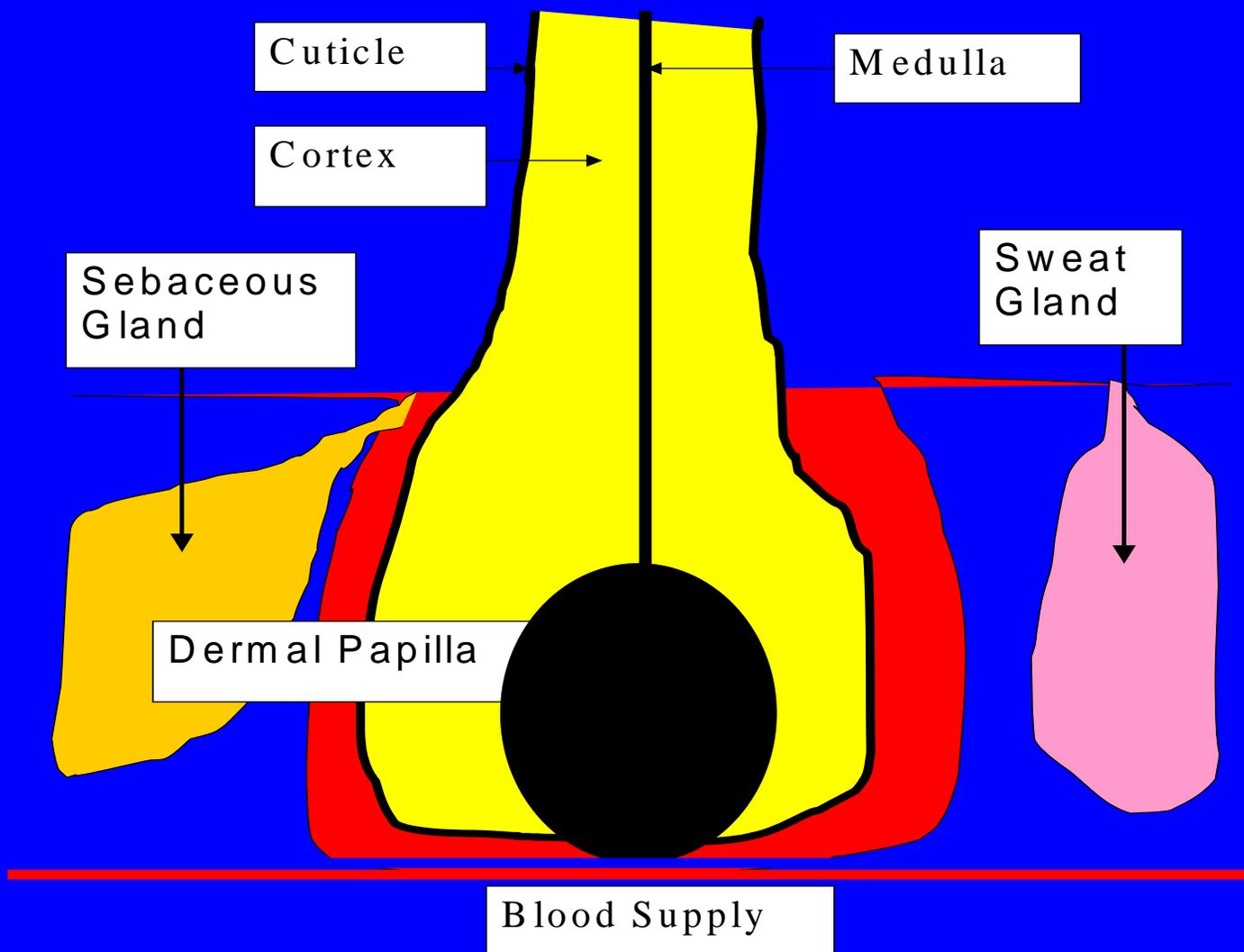
- Although the drugs are incorporated into the hair shaft, drugs can be removed through rigorous “cleaning” of the hair with vinegar, bleaching, coloring, chlorine from swimming, or even damaged from excessive sun damage
- Cannot remove it all and can still be detected. Infrequent use of drugs could be diminished to avoid reporting

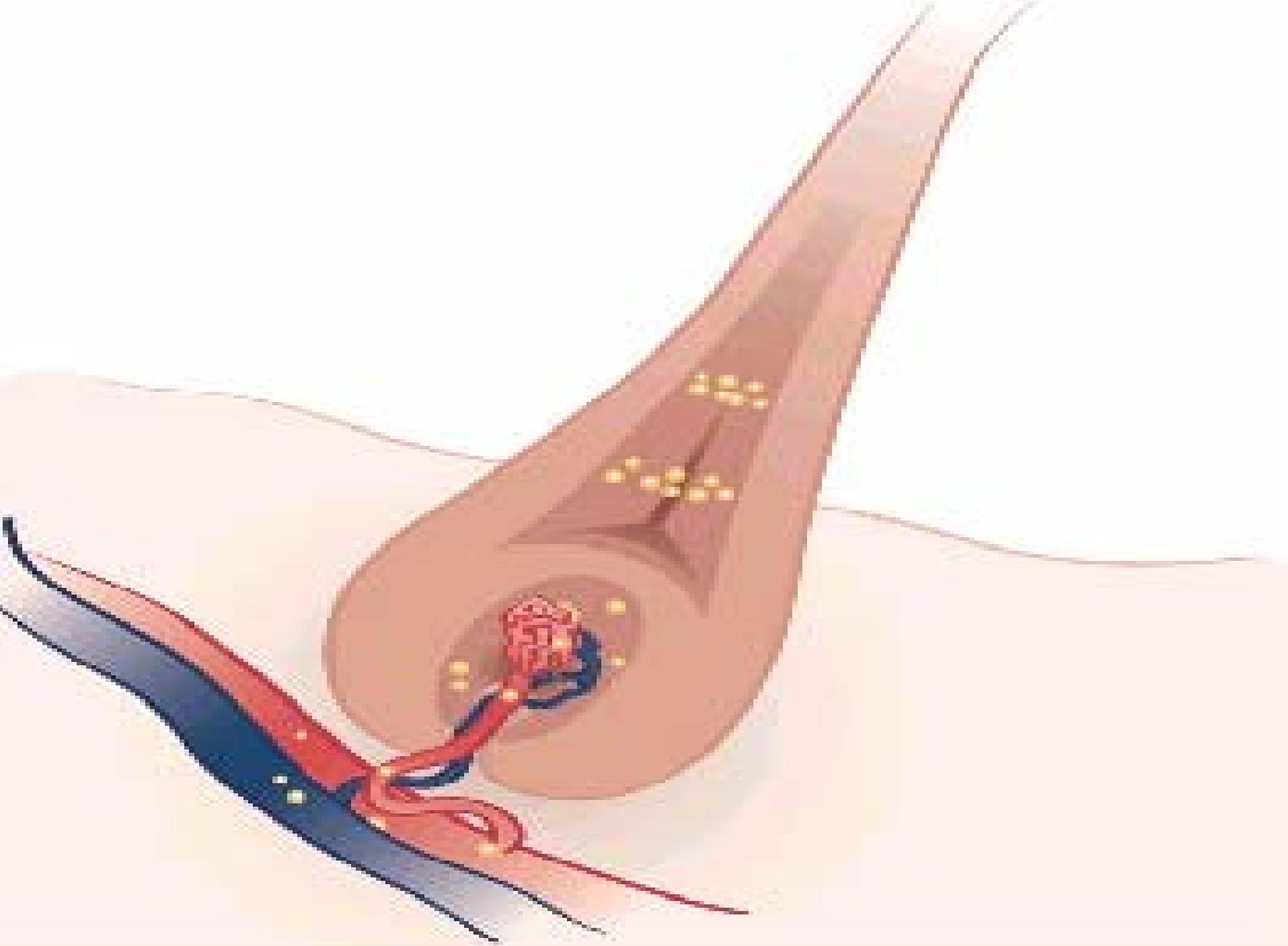
Hair Cutoffs (pg/mg)

<u>Drug</u>	<u>Screen</u>	<u>Confirmation</u>
Cannabinoids	1.0	0.1
Opiates	200	300
6-AM		300
Amphetamines*	300	300
MDA/MDMA		300
*Amphetamine must be ≥ 50 pg/mg to report methamphetamine		
PCP	300	300
Cocaine**	500	500
Benzoylecgonine		50
Cocaethylene		50
Norcocaine		50

**Metabolite must be ≥ 50 pg/mg present to report cocaine

ROOT OF HAIR





Hair Collection Problems



- Not enough hair to collect!
- Not enough hair cut
- Religious reasons
- Shaving head before test
- Hair is suddenly bleached
- Lice

Detoxify
BRAND



Scared what your hair
might say about you?



NEW Introducing ROOT CLEAN™ - the premier Hair Cleansing System™ from Detoxify®. It is the newest addition to the industry's best-selling cleansing brand. Through its two-part process, ROOT CLEAN penetrates the hair shaft removing all unwanted impurities and toxins. It works immediately and lasts up to 8 hours.

Trust Detoxify® to get you clean all over.

Other Detoxify® products work internally. They clean your system in one hour and keep it clean for up to five hours. So no matter what type of clean you are looking for, Detoxify can get you there.

AQUA CLEAN™

Effervescent Cleansing System.™

The first water-soluble, effervescent cleansing tablets in the industry.

FAST FLUSH CAPS®

Proven Effective. Powerful. Discreet.™

A revolutionary formula with only 10 capsules and less water to drink.

READY CLEAN®

The #1 Seller. Because It Works.™

The one hour liquid cleansing formula with over one million satisfied customers.

XXTRA CLEAN®

The Ultimate Cleansing Combination.™

An exclusive liquid formula for people with higher toxin levels or larger body mass.

**Research you can count on.
Products you can trust.™**



Available at alternative and health food stores.

FOR INFORMATION
1.800.DETOX4U
www.detoxify.com

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PROBLEM:

BOB M.
Customer Service

Bob is a customer service representative for a major U.S. company. He has been offered a promotion based on his outstanding productivity. If he passes a drug test, he will receive a generous pay increase & more benefits.

Clear Choice

SOLUTION:

**Hair Follicle
Shampoo™**
One Application for Short Hair



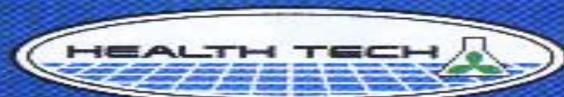
\$35

REMOVES ALL TOXINS WITHIN 10 MINUTES—CLEAR ZONE FOR UP TO EIGHT HOURS

GUARANTEED 200%—DOUBLE YOUR MONEY BACK!

QUESTIONS & ORDERS
TOLL-FREE 24 HOURS A DAY
1-888-TECH 420
www.magicvan.com

**NEXT DAY
DELIVERY
AVAILABLE**



Trusted by Thousands Since 1993

SPECIMEN IDENTIFICATION NUMBER (FROM REQUISIT



DONOR SSN OR EMPLOYEE ID NO.:

745150

COLLECTION SITE:

Job Cape / Selma

INITIALS OF DONOR:

XAL

By these initials, I certify that I consented to the collection of a hair sample from my body by the collector and that the hair sample was placed in the transfer envelope and sealed in my presence.

HAIR SAMPLE COLLECTOR:

[Signature]

DATE AND TIME:

7/24/02

3:45 pm

I certify that I collected the hair sample enclosed in this envelope, that it is from the body of the above donor, and that it was collected with the donor's knowledge and consent. I further certify that the information on this envelope is true and correct.

SOURCE OF SAMPLE:

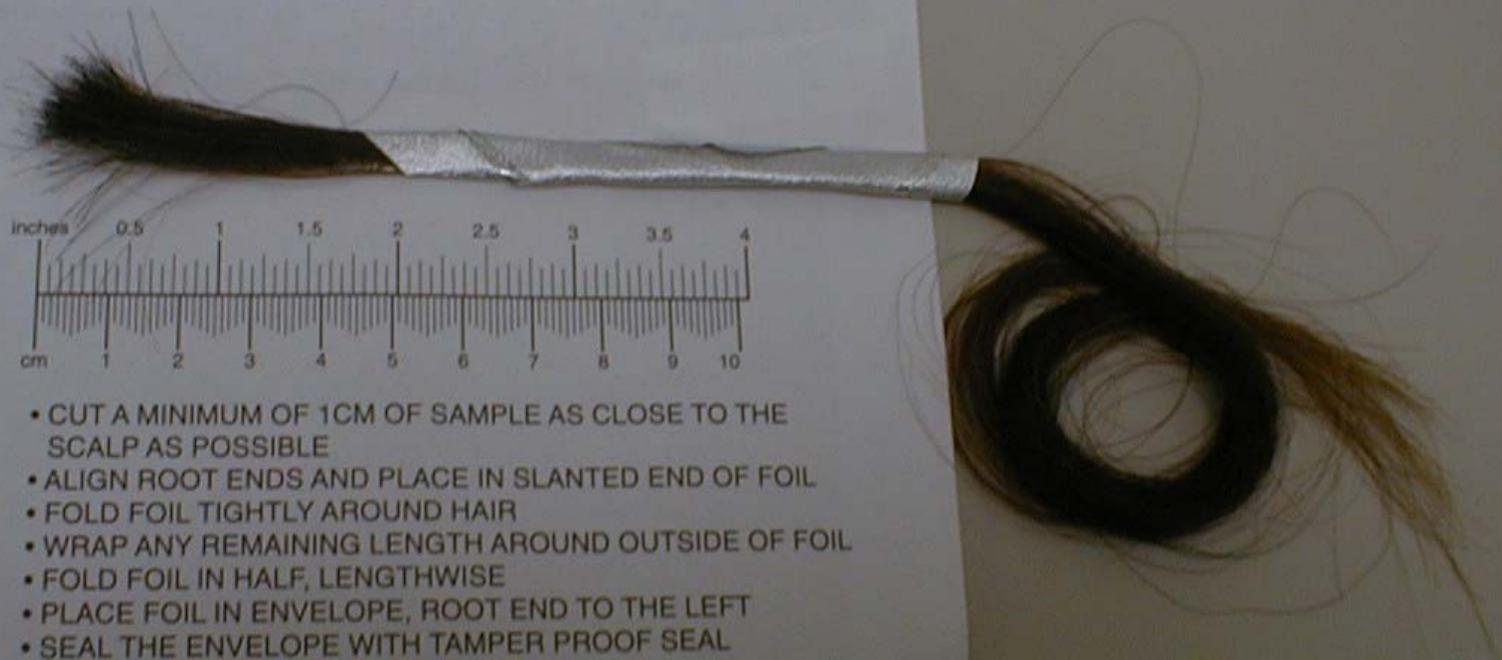
Head Underarm Chest Other

Bottle Seal A



Place
INTEGRITY SEAL

15184608 - SPECIMEN ID NO.









①

Mode
Units
Setup

Stable

WEIGH

200.0 mg

Enter Print

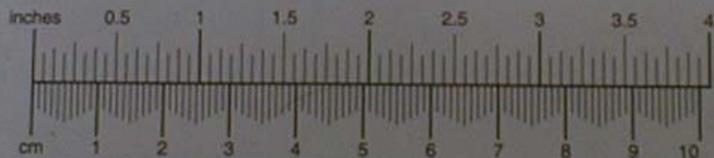
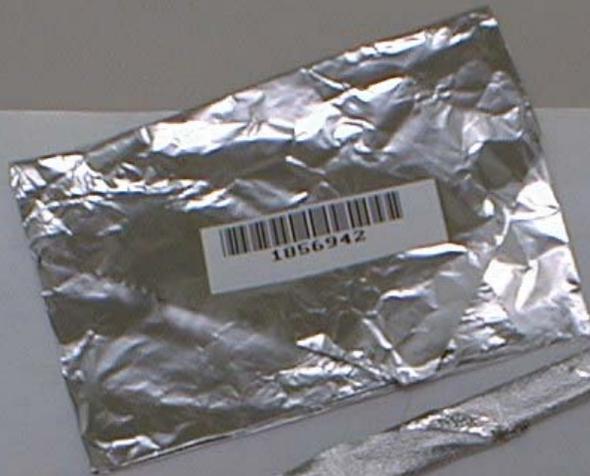
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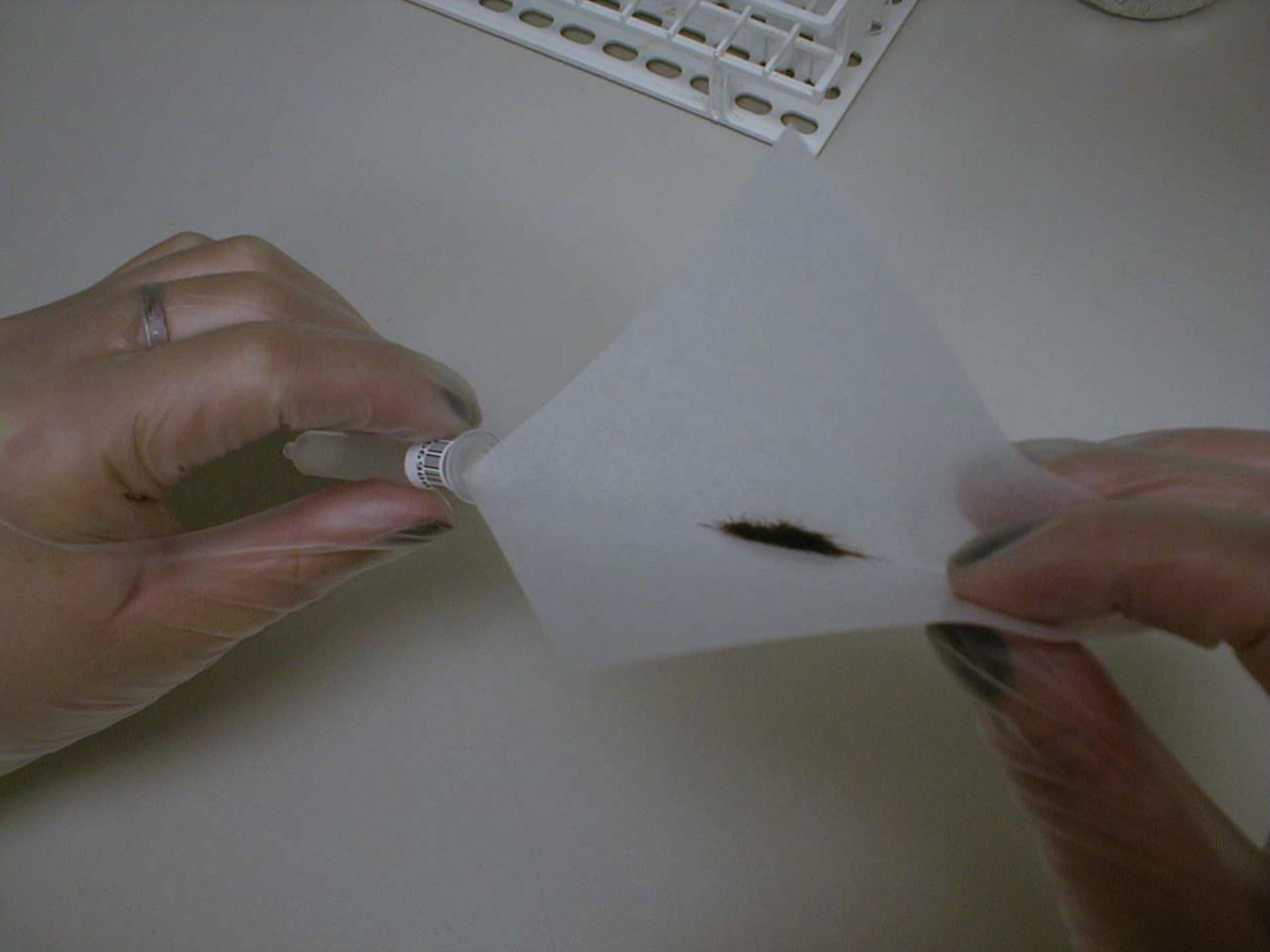
Explorer

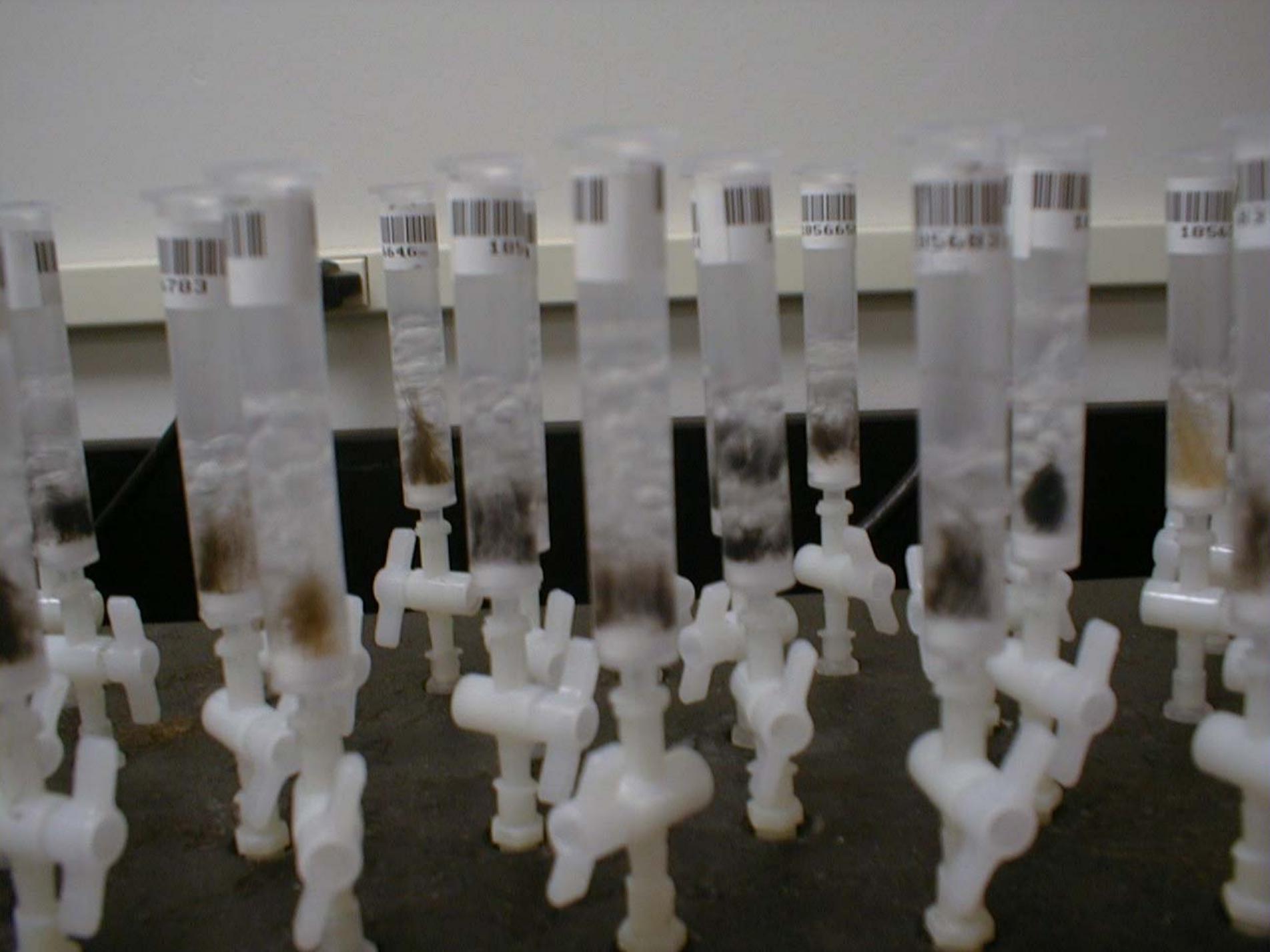


Size: 13 x 100mm
DISTRIBUTED BY



- CUT A MINIMUM OF 1CM OF SAMPLE AS CLOSE TO THE SCALP AS POSSIBLE
- ALIGN ROOT ENDS AND PLACE IN SLANTED END OF FOIL
- FOLD FOIL TIGHTLY AROUND HAIR
- WRAP ANY REMAINING LENGTH AROUND OUTSIDE OF FOIL
- FOLD FOIL IN HALF, LENGTHWISE
- PLACE FOIL IN ENVELOPE, ROOT END TO THE LEFT
- SEAL THE ENVELOPE WITH TAMPER PROOF SEAL





HEAT BLOCK #1

HB05

THERMOLYNE
DRI-BATH

TEMP

WARNING

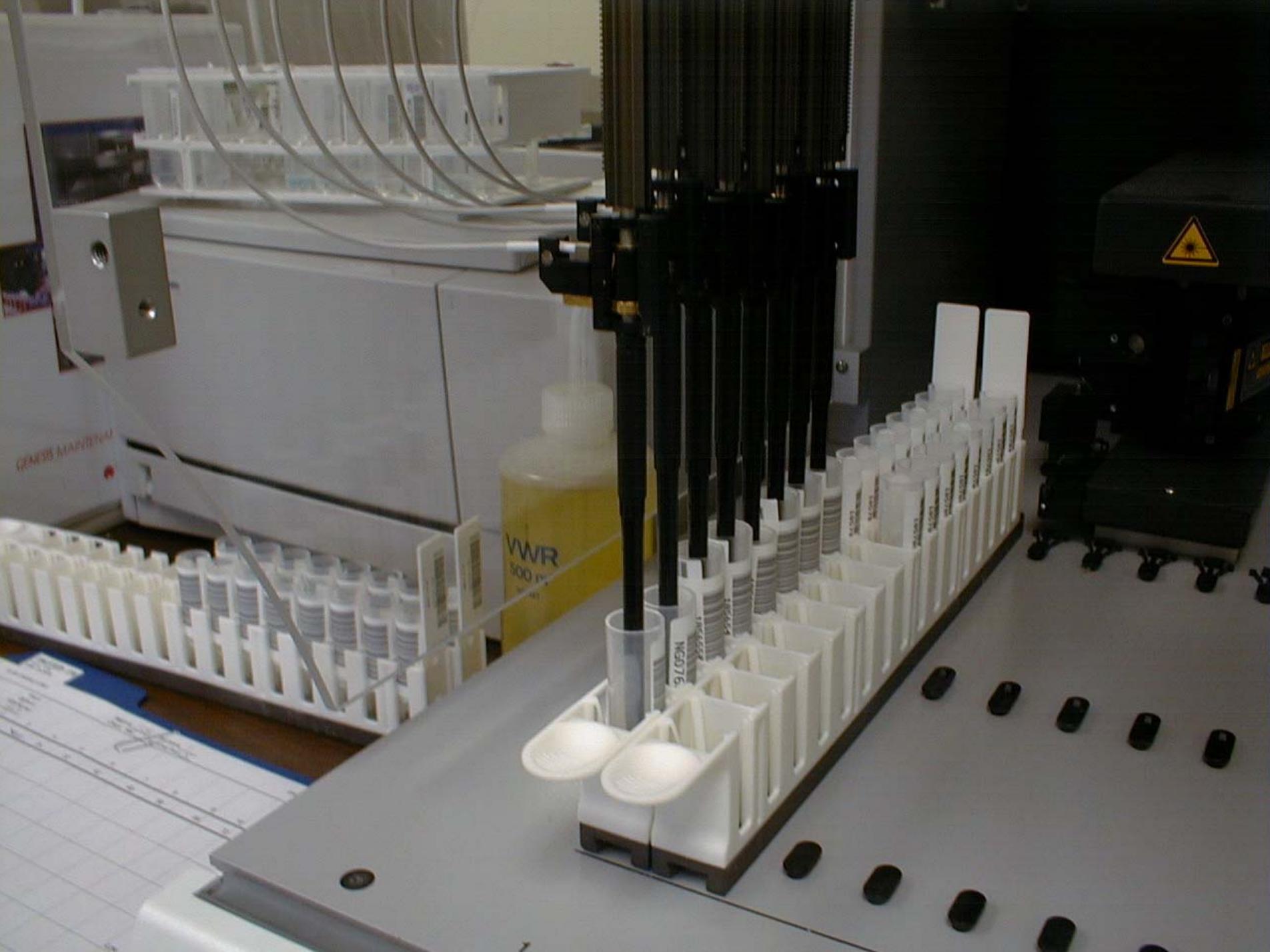
DO NOT USE IN THE PRESENCE OF
FLAMMABLE OR COMBUSTIBLE
CHEMICALS.
FIRE OR EXPLOSION MAY RESULT.
SEE OPERATING INSTRUCTIONS.

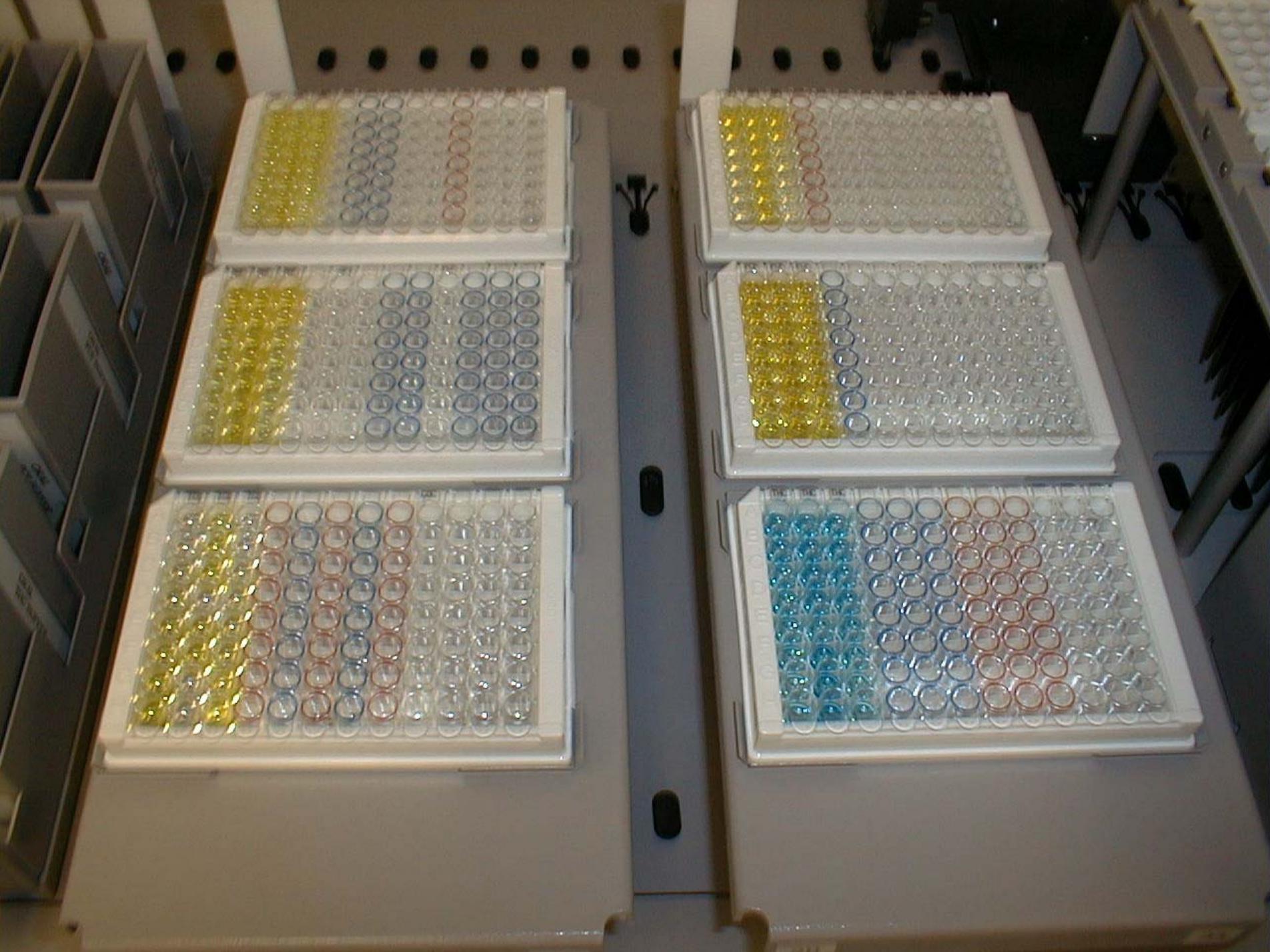


Hair Screening & Oral Fluid Screening

- ELISA screening technology is used for hair testing using 96 well technology
- Concentration is correlated to the color intensity in the well and is compared to calibrators
- All processes are computer controlled robotics - but is much slower and more expensive than urine screening - but multiple times more sensitive than urine methods







Hair & Oral Fluid Confirmation Techniques

- Confirmations for all drugs except marijuana can be completed on standard GC/MS's
- Marijuana must be confirmed by GC/MS/MS due to the low levels in the hair
- Extractions and confirmatory techniques are highly sophisticated to achieve the sensitivity and selectivity required for successful analysis

Oral Fluid Testing

- No special collection facilities or fees
- Collection can occur anywhere
- Collection device requires only two minutes in the mouth and is witnessed by the collector
- Possibility of adulteration is drastically reduced
- Indicates recent drug usage and correlates with impairment of the donor by looking at parent drug rather than metabolites
- Screening and confirmation processes are similar to hair

Forehead Swipe Collections

- A moistened gauze swab across the forehead can collect amphetamines, cocaine, and other drugs that are sweated through the skin or included in skin oils
- Drugs can be detected within a few hours up to several day
- Swab can be placed into a zip-lock bag and sent to the laboratory
- Patches are available for up to 7-day monitoring

Meconium and Blood

- Meconium provides for a long term exposure of drugs during the pregnancy and would be the primary sample for the detection of drugs
- Would not be the specimen of choice once the infant has been released. Urine or oral fluids would provide results of recent events.
- Blood is typically not a specimen of choice since the Lab needs too much blood for testing for drugs of abuse. Require 1-2 mL to provide minimal testing