The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title:	Analysis of Drugs of Abuse in Human Hair: Surface Contamination and Localization of Analysis
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Document No.:	249856
Date Received:	April 2016
Award Number:	2013-DN-BX-K021

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Applied Research and Development in Forensic Science for Criminal Justice Purposes

Analysis of Drugs of Abuse in Human Hair: Surface Contamination and Localization of Analysis

Final Summary Overview

Submitted via Grants.gov to: U.S. Department of Justice Office of Justice Programs National Institute of Justice 810 Seventh St., NW Washington, DC 20531

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November 20, 2015

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NIJ Award No. 2013-DN-BX-K021 RTI Proposal No. 0281300.529 RTI Project No. 0214076.000



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Purpose

For more than two decades, researchers and scientists have investigated and employed hair testing for drugs of abuse as a complementary and alternate matrix to blood and urine. The utility of hair testing is founded on the hair's ability to reflect long-term drug use and to incorporate drug analyte securely, as well as on the ease of testing agencies to collect and store hair samples. Testing for drugs in hair has evolved to the point that determining the identity of the drug found is less an issue than the explanation of the route of deposition. Despite considerable research, given current analytical technologies and interpretive methods, environmental contamination remains an unresolved issue for hair, and controversy exists over the source of drug residues found in hair and the potential for environmental contamination to cause false-positive test results.

Methamphetamine has been confirmed as a major contaminant associated with clandestine methamphetamine laboratories. The persistence of surface contamination of methamphetamine in clandestine laboratories presents a non-trivial possibility for environmental contamination to persons entering those spaces, including law enforcement first responders. The purpose of this study was to examine the effects of environmental contamination of human hair leading to external deposition of methamphetamine and heroin on drug tests designed to identify drug use. The goals of this project were to determine 1) the likelihood of whether methamphetamine and heroin can be adequately removed by an extended aqueous phosphate buffer decontamination procedure, 2) if, over time and with normal hygienic treatment of the hair, the drug will be removed from the hair or prove resistant to removal and 3) the extent to which normal hygienic treatment and the extended aqueous phosphate buffer decontamination procedure affect measurable levels of methamphetamine and heroin in hair from drug users who have ingested those compounds and 4) whether several imaging techniques could be used to localize the site of incorporation of the drugs into hair as an indicator of the route of incorporation (e.g., contamination versus consumption).

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Project Design

Blank hair samples from non-drug users (E1-E5) and hair samples from known drug users (U1-U6) were acquired through IRB approved protocols. Blank hair samples were contaminated with methamphetamine and heroin using an in vitro contamination process at a concentration of 8mg/drug for every10g of hair. The project was divided into two parts: one involving an LC-MS analysis of the hair samples under different hygienic and decontamination treatments, and one involving imaging of the hair samples.

For the LC-MS portion of the project, each sample was divided into two portions, one was shampooed every weekday for 8 weeks, the other was left on the bench top with no further treatment over the same 8 week period. Two aliquots were taken from each portion of each sample at 8 time points over the course of the study, according to the sampling schedule depicted in Figure 1.

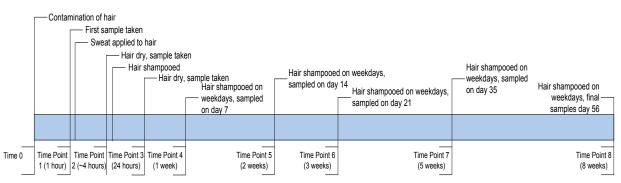


Figure 1 Hair sampling schedule with time point descriptions

One aliquot was decontaminated using an extended phosphate buffer decontamination procedure and one received no additional decontamination prior to extraction and LC-MS analysis. The sampling scheme is shown in Figure 2. Samples were

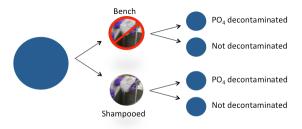


Figure 2 Diagram of the hair sampling scheme

analyzed for the presence of methamphetamine (MAMP), amphetamine (AMP), 6-acetylmorphine

(6-AM) and morphine.

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For the imaging portion of the project, unless otherwise noted in the imaging results section below, blank hair, externally contaminated hair, and drug user hair were analyzed, and the externally contaminated hair samples underwent 1 shampooing prior to analysis.

Results

LC-MS

An LC-MS/MS method for the extraction and quantification of MAMP, AMP, heroin, 6-AM, and morphine from human hair was developed and validated according to SWGTOX guidelines. Explicit details of the methods and validation will be provided in future publications. Briefly, hair samples were extracted by gentle heating and shaking in phosphate buffer for 18 hours. Matrix matched calibrators and QCs were prepared by spiking blank hair with known amounts of analytes prior to extraction. Stable isotope labeled analogs of each analyte of interest were used as internal standards. Validated calibration ranges for each analyte are as follows: MAMP 25-10000 pg/mg, AMP 50-2000 pg/mg, Heroin 25-10,000 pg/mg, 6-AM 2.5-75 pg/mg, morphine 2.5-200 pg/mg. Society of Hair Testing (SOHT) guidelines for drug testing in hair (Cooper, Kronstrand, and Kintz, FSI vol. 218 Issues 1-3, pages 20-24 2012) recommended cut-offs for MAMP, AMP, 6-AM and morphine are 200 pg/mg. No cut-off recommendations are made for heroin.

MAMP

There was significant individual variation in how much MAMP was absorbed by the hair samples, despite all the samples being dark brown or black. After the contamination and a single shampooing (TP3), non-decontaminated hair concentrations ranged from 13,175 (E5) to 49,675 (E2) pg/mg with a relative standard deviation of 47%. At the same time point, samples that underwent PO₄ decontamination prior to extraction ranged from 2,935 (E5) to 15,275 (E2) pg/mg with a relative standard deviation of 59%.

Decontamination was highly effective immediately after the contamination and much less effective once synthetic sweat was applied. With PO₄ decontamination, 4/5 samples were below the Final Summary 2013-DN-BX-K021

cut-off one hour after contamination. After synthetic sweat was applied 0/5 samples were below the cut-off. Before synthetic sweat was applied (TP1), PO₄ decontamination removed on average 99.8% of the added MAMP, 4 hours after synthetic sweat was applied (TP2) the PO₄ decontamination only removed 89% of the MAMP.

Shampooing steadily decreased the levels of MAMP present in the externally contaminated hair samples. However, of the 5/5 samples above cut-off at TP3, 4/5 were still above 200 pg/mg after 8 weeks of shampooing, and including the PO₄ decontamination prior to extraction. The one sample that was below the cut-off at TP8, was above the cut-off at TP7. Continued shampooing also steadily decreased the levels of MAMP present in the user hair samples.

AMP

Initial testing of the blank hair samples determined that the concentration of AMP in all samples was 2-3 pg/mg, which is below the LOQ of our methods. Despite contaminating only with MAMP measurable levels of the MAMP metabolite AMP were detected in all samples. After the contamination and a single shampooing (TP3), samples that underwent PO₄ decontamination prior to extraction ranged from 9 (E5) to 82 (E2) pg/mg. Without the decontamination step concentrations ranged from 22 (E5) to 465 (E2) pg/mg. For externally contaminated hair that was not shampooed, the level of AMP increased over time. This trend was not observed in the user hair samples, but in all cases the levels were below the validated LOQ.

Heroin

Shampooing effectively removed parent heroin from the contaminated hair. 3/5 samples that underwent PO₄ decontamination and 5/5 non-decontaminated samples were over 200 pg/mg at TP3. At TP3 samples that weren't decontaminated prior to analysis ranged from 7078 (E1) to 23,050 (E2) pg/mg. By TP7 the highest level of heroin measured in any shampooed hair sample was 85 pg/mg, by TP8 the highest level measured was 48 pg/mg. At TP3 the decontamination procedure removed on average 97% of heroin from externally contaminated hair. Upon initial testing only two of the

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user hair samples had levels of heroin above our limit of quantification. The decontamination procedure removed 97% of the heroin from one sample and 74% of the heroin from the other.

Initial testing of the blank hair samples determined that the concentration of 6-AM in all samples was below the LOD of our methods. After contamination with MAMP and heroin, significant amounts of the heroin metabolite 6-AM were detected in all samples. After the contamination and a single shampooing (TP3) samples that underwent PO₄ decontamination prior to extraction ranged from 28 (E1) to 214 (E3) pg/mg. 3/5 of the samples were above the SOHT suggested cut-off. Without the decontamination step 5/5 of the samples were above the SOHT suggested cut-off with concentrations ranging from 920 (E1) to 3153 (E2) pg/mg. After 8 weeks of shampooing and including the PO₄ decontamination, one of the samples was still above the SOHT suggested cut-off.

Morphine

6-AM

Initial testing of the blank hair samples determined that the concentration of morphine in all samples was below the LOD of our methods. After contamination with MAMP and heroin, morphine was detected in all samples. After the contamination and a single shampooing (TP3) samples that underwent PO₄ decontamination prior to extraction ranged from 5 (E1) to 42 (E2) pg/mg. Without the decontamination step concentrations ranged from 152 (E1) to 471 (E2) pg/mg.

Imaging

The original proposal included imaging the analytes of interest in user and contaminated hair by matrix assisted laser desorption ionization mass spectrometry (MALDI-MS). Through a GAN, the scope of the imaging portion of the project was expanded to include atomic force microscopy coupled with infrared spectrometry (AFM-IR), scanning electron microscopy (SEM) both with and without electron dispersive x-ray spectroscopy (EDS), and time of flight secondary ion mass spectrometry (TOF-SIMS).

MALDI-TOF

Initial MALDI-TOF imaging experiments were performed by scientists at JEOL Inc. Samples of hair from 2 individual users (U1 and U3) were extracted in MeOH (~35ug/uL). The methanolic extracts were mixed 1:1 with Cyano-4-hydroxycinnamic acid (CHCA) as a MALDI matrix then spotted for analysis. The CHCA matrix contained interferents that obscured the signals for methamphetamine and amphetamine. Heroin, morphine, and 6-acetylmorphine (6-AM) were detected at low levels in U3, but not in U1. MALDI-TOF imaging of 6-AM on intact strands of U3 was performed and is shown in Figure 3.

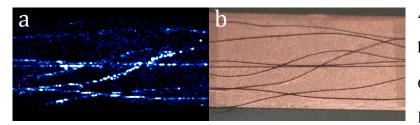


Figure 3 MALDI-TOF image of 6-AM distribution on user hair strands (a) and an optical image of the strands post analysis (b)

As shown in Figure 3, MALDI-TOF has the required sensitivity to detect 6-AM on intact strands of user hair. However, the spatial resolution of the technique is not sufficient to localize

the position of the analytes to the cuticle or cortex of a cross section of a hair sample. Therefore work to find a MALDI matrix with fewer interferents was not pursued and instead alternate imaging techniques were investigated.

AFM-IR

AFM-IR imaging experiments were performed by scientists at Anasys Instruments. Hair strands were embedded in epoxy and cross sections ~ 400 nm thick were prepared using a



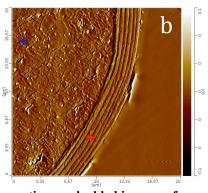


Figure 4 Optical image of hair cross sections embedded in epoxy for AFM-IR analysis (a) and an AFM deflection image showing the cuticle and cortex (interior) of a cross section of an externally contaminated hair sample (b).

microtome. Cross sections of blank hair and externally contaminated hair were analyzed. Figure 4a shows an optical image of the cross sections embedded in epoxy positioned for analysis. An AFM deflection image of one of the externally contaminated hair cross sections is shown in Figure 4b.

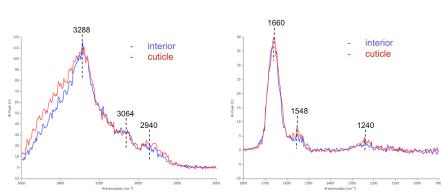


Figure 5 IR spectra taken from the interior and cuticle regions of the cross section shown in Figure 4 Optical image of hair cross sections embedded in epoxy for AFM-IR analysis (a) and an AFM deflection image showing the cuticle and cortex (interior) of a cross section of an externally contaminated hair sample (b).Figure 4b.

The spectra in Figure 5 were acquired from the positions marked with red and blue plus signs in Figure 4b. The red trace is from the cuticle, and the blue trace is from the interior of the hair. No clear differences between multiple spectra from these two regions

were detected, and no heroin, methamhetamine, or their metabolites were detected in any of the spectra from either region. Spectra from an externally contaminated hair sample were indistinguishable from spectra from a blank hair sample. The exterior surface of intact strands of both blank and externally contaminated hair samples were also analyzed, with no clear differences detected between them and no heroin, methamphetamine or metabolites detected.

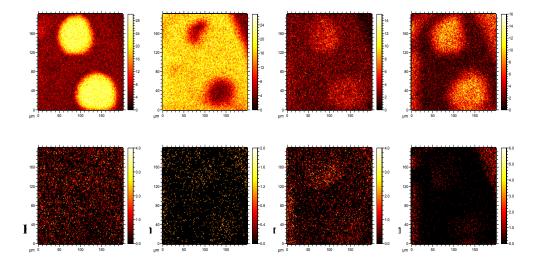
As shown in Figure 4b, AFM-IR has sufficient spatial resolution to collect distinct spectra from the cuticle and the interior, however, our methods lack the required sensitivity to detect analytes at physiologically relevant concentrations.

TOF-SIMS

TOF-SIMS analysis was performed at the Advanced Instrument Facility at North Carolina State University. Good signal was obtained for standards of the analytes of interest when spotted at 1000 ng/mL directly onto plates for analysis. Intact hair strands were analyzed by placing the hair

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on conductive carbon tape. Hair cross sections were prepared by embedding the hair in epoxy then



microtoming. Despite confirmed presence of the molecules by LC-MS analysis, no molecular ions

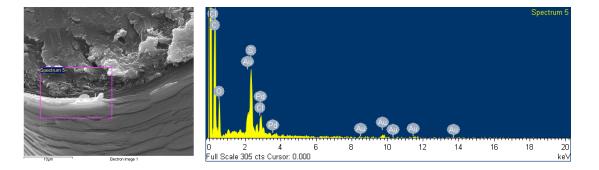
of methamphetamine, heroin, or any metabolites were detected on the surface or cross sections of contaminated hair. An additional analysis was performed on a cross section of externally contaminated hair that had not undergone the initial shampooing, but no analytes of interest were detected on that sample either. Similarly to AFM-IR, TOF-SIMS has the required spatial resolution to distinguish ions located in the cortex vs. interior of a hair cross sections, but with the methods employed in this study lacked to required sensitivity to detect the ions of interest at concentrations that would be relevant to improve the reliability of hair testing.

SEM-EDS

The addition of an EDS detector to an SEM microscope allows for elemental analysis and can show elemental distribution on a sample surface. Since the analytes used in the original contaminations contain the same elements (C, H, N, O) that are naturally found in hair a separate contamination was performed using 4-bromoamphetamine, specifically for the SEM-EDS analysis.

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This introduced Br into the hair as a contaminant. Hair was externally contaminated at the same analyte to hair ratio as in the previous contamination (8 mg:10 g) then after one hour synthetic sweat was applied. Once the hair was dry, approximately 4 hours later, several strands were removed for analysis and the remaining hair was shampooed. The following morning, several strands cf the



shampooed hair were also removed for analysis. SEM-EDS was unable to detect a signal for Br from either set of samples. The SEM image of the non-shampooed sample is shown in Figure 7a and a summed spectrum from the region enclosed in the pink box in Figure 7a is shown in Figure 7b. This region contains a contribution from the external surface of the hair, and yet no Br is detected in the region. Similar to AFM-IR and TOF-SIMS, SEM-EDS has the necessary spatial resolution to localize analytes to either the cortex or cuticle of hair, but does not have sufficient sensitivity to detect the analytes at physiologically relevant concentrations.

Scholarly Products

Planned Publication

External contamination with heroin and methamphetamine in human hair Megan Grabenauer, Breda Munoz, Katherine N. Moore, Nichole D. Bynum Manuscript in preparation

Presentations

Can drug use be distinguished from external contamination in hair drug testing? Megan Grabenauer, Jeri D. Ropero-Miller, Peter R. Stout, Katherine N. Moore, Nichole D. Bynum Presented at the 2015 Triangle Chromatography Discussion Group Symposium, May 21, 2015 Raleigh, NC

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Analysis of heroin and methamphetamine in human hair: surface contamination and localization of analytes

Megan Grabenauer, Breda Munoz, Katherine N. Moore, Jeri D. Ropero-Miller, Nichole D. Bynum Abstract submitted to the 2015 Society of Forensic Toxicologists Meeting, October 18-23, 2015 Atlanta, GA

Implications for Policy and Practice

Prior studies have raised significant concerns about the potential for contamination to confound hair testing results, which could have direct consequences, either supporting or refuting, claims of contamination being the source of positive hair results. Our results continue to raise such concerns. Despite contaminating blank hair with only methamphetamine and heroin, measurable levels of their respective metabolites amphetamine, 6-acetylmorphine and morphine were detected. In some instances, the levels of metabolites detected were above the SOHT recommended cut-offs, indicating that basing positive results solely on the presence of metabolites is not sufficient to rule out possible contributions from external contamination. Many hair testing laboratories institute decontamination procedures prior to analysis in an attempt to remove any contribution from external contamination. Our studies show that a decontamination step alone is likely not sufficient to remove contributions from external contamination.

Setting positive call criteria based on parent/metabolite ratios has been proposed as a method to distinguish between use and contamination for some analytes. Given the large individual variation in drug absorption during the contamination phase that we observed, further studies using larger samples sizes are needed to determine if that is a valid route for identifying methamphetamine and heroin contamination. However, our initial results indicate that this route may be problematic as the concentrations of metabolites present in externally contaminated hair can vary depending on how long the hair sits prior to analysis.

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Materials and Methods

Drug standards for preparing calibrators were purchased from Cerilliant (Round Rock, Texas). Heroin HCl and MAMP HCl used in hair contamination were purchased from Lipomed (Cambridge, MA). All reagents were high-performance liquid chromatograph (HPLC) grade. Acetonitrile, water, methanol, and isopropanol were purchased from Fisher Scientific (Fair Lawn, NJ). Ammonium hydroxide and urea were purchased from EMD (Gibbstown, NJ). Potassium phosphate monobasic, potassium phosphate dibasic, sodium lactate, and bovine serum albumin (BSA) were purchased from Sigma Aldrich (St. Louis, MO). Sodium chloride and potassium chloride were purchased from BDH (VWR West Chester, PA), and Research Organics (Cleveland OH), respectively. Ammonium formate, formic acid and extra virgin olive oil were purchased from Alfa Aesar (Ward Hill, MA), Electron Microscopy Sciences (Hatfield, PA), and a local supermarket, respectively. Oasis HLB 3cc (60 mg) extraction cartridges and Orbital Shaker were purchased from Waters (Milford, MA), and Thermo Fisher Scientific (Waltham, MA), respectively.

Synthetic Sweat Preparation

Synthetic sweat was prepared by mixing. 22 mM urea, 65 mM sodium chloride, 5 mM potassium chloride, 9 mM sodium lactate, and 150 μ L of extra virgin olive oil (Ropero-Miller *et al*). The mixture was refrigerated until use.

Time point samples

RTI collected non-chemically treated head hair from 10 drug-free donors and 20 druguser donors under approved IRB protocol. Head hair samples that ranged in color from blond to dark brown were shaved using electric clippers or cut with clean scissors. All of the hair samples were analyzed by LC-MS/MS to determine if they were negative (drug-free) or positive for the analytes of interest. This analyses represented time point 0 (TP0). Five separate lots of dark brown to black drug-free hair at 10 g each were used for the contamination studies and one separate dark brown lot was used for preparation of calibration curves. For external contamination, 8 mg of heroin and 8 mg of methamphetamine were mixed together in gloved hands and distributed on the palms for approximately 5 minutes until no solid was visible. After 5 minutes, one lot of hair was placed into the gloved hands and rubbed for 5 minutes to evenly transfer the heroin and methamphetamine. The contaminated hair was then placed between two pieces of filter paper for one hour. The procedure was repeated for each hair lot, using a new pair of gloves each time.

After an hour, time point 1 samples were removed from each lot. The remaining hair samples were sprayed with the synthetic sweat solution until saturated. The samples were then placed between two pieces of filter paper to dry for 3-4 hours before time point 2 samples were removed. After time point 2 samples were removed, each sample was shampooed, then placed between two new pieces of filter paper to dry. The following morning time point 3 samples were taken. At that point the remaining samples were split into approximately 5 g portions. The first portion (i.e. shampooed samples) was shampooed daily (Monday-Friday) over 8 weeks. The second portion (i.e. bench samples) remained on the lab bench for 8 weeks. The shampooed hair samples were washed with Finesse 2-in-1 shampoo for approximately 5 minutes and rinsed until

all shampoo was removed. The samples were placed between two pieces of filter paper and dried overnight. Each of the five externally contaminated hair samples were washed each week day and samples were taken from the bench and shampooed samples at 5 additional time points: TP4 at 1 week, TP5 at 2 weeks, TP6 at 3 weeks, TP7 at 5 weeks, and TP8 at 8 weeks post contamination.

Six different lots of drug-user hair with the highest measured levels of the analytes of interest at TP0 were used for the study. The same procedure was followed as described previously for the externally contaminated hair specimens, with the exception of the contamination part.

Decontamination Process

At each time point for both drug-user hair and externally contaminated hair, two aliquots of approximately 75-80 mg of each hair lot (bench and shampooed for both drug-user and externally contaminated hair (n=8)) were removed and placed into separate labelled scintillation vials. One aliquot underwent the decontamination process, while the second aliquot was not decontaminated. The samples for decontamination were decontaminated using 0.01 M phosphate buffer containing 0.01% BSA. The decontamination procedure consisted of an initial 15-minute isopropanol wash, followed by three 30-minute and two 60-minute phosphate buffer containing BSA washes. Washes were replaced after each interval and the last 60-minute wash was kept in the freezer for future analysis.

After the decontamination process, each sample was placed between two pieces of filter paper until dry. Once dried, both the PO₄ decontaminated samples and the non-decontaminated samples were placed into labeled scintillation vials and the hair strands were cut and weighed into four separate test tubes containing approximately 10 mg each.

Extraction Process

Following the decontamination process, internal standard was added to each 10 mg sample, drug spiked calibrator, and drug spiked QC, and vortexed. An aliquot of 1.5 mL of 100 mM potassium phosphate monobasic (pH 5) was added to each sample. Samples were vortexed and centrifuged for 5 min at 3500 rcf followed by incubation at 37 °C for 18 hrs in an orbital shaker at 100 rpm. After incubation, the samples were vortexed and centrifuged at 3500 rcf for 5 minutes followed by solid phase extraction (SPE) using Oasis HLB cartridges. SPE cartridges were conditioned with 1 mL of methanol and 100 mM potassium phosphate monobasic (pH 5), each. The samples were loaded onto the cartridges and allowed to flow by gravity. Samples were washed with 1 mL of 5% methanol in water. Cartridges dried for 5 minutes under nitrogen. The samples were eluted in 1 mL of methanol containing 2% ammonium hydroxide. Samples were evaporated to dryness under nitrogen at room temperature (25°C) and reconstituted in 100 µL of ammonium formate with 0.1% formic acid and acetonitrile with 0.1% formic acid (95:5).

LC-MS/MS Methods

Samples were acquired on an AB Sciex 4000 QTrap (MS/MS) (Framingham, MA) mass spectrometer coupled to a Waters Acquity ultra performance liquid chromatography (UPLC) system (Waters, Milford, MA) with a turbo spray source operating in positive mode. Samples were injected (10 µL) onto an Agilent Zorbax RRHD Eclipse Plus C18 (1.8 µm 2.1x50 mm, Santa Clara, CA) column held at 30 °C. A gradient elution was used consisting of 5 mM ammonium formate with 0.1% formic acid (mobile phase A) and acetonitrile with 0.1% formic acid (mobile phase B). The flow rate was 0.4 ml/min. Beginning conditions were 5% B; this was increased linearly to 22% B by 4 min; increased linearly to 50% B by 5 min; then increased

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linearly to 95% B from 5.1 to 6 min; followed by returning to initial conditions and equilibrating from 6.2 to 7.5 min.

Validation Methods

Calibration Curve

The calibration curve spanned the range of biologically relevant concentrations expected in hair using non-zero calibrators for 6-acetlymorphine (6 calibrators), amphetamine (5 calibrators), heroin (8 calibrators), morphine (7 calibrators), and methamphetamine (8 calibrators). The calibration curve was established, extracted and analyzed five times (n=5 at each concentration level). Each analyte's respective stable isotope labeled compound was used as an internal standard.

Precision and Accuracy

Precision and accuracy were determined by analyzing two quality control (QC) samples for amphetamine and morphine and four QCs for heroin, methamphetamine, and 6acetylmorphine each fortified with analyte concentrations at the lower, middle, and upper portion of the calibration curve. Each QC sample was analyzed in triplicate within each linearity run over the course of five runs.

Limit of Quantification (LOQ)

The LOQ was defined as the concentration of the lowest calibrator, which was administratively set during establishment of the calibration curve.

Carryover

Carryover was determined by analyzing blank sample matrix immediately after a high concentration sample in each calibration curve (n=5). A sample was considered to have

carryover if the average peak area in the blank after the carryover sample was greater than 20% of the peak area of the established LOQ.

Interference

Ten different blank lots of drug-free donor hair samples were run by LC-MS/MS without addition of internal standard (ISTD) to evaluate interference from the matrix. Hair matrix was considered to interfere with an analyte if the average area of the blank samples (n=10) was greater than 20% of the average LOQ peak area of that analyte from the five calibration curves (n=5). In addition, five blank matrix samples containing ISTD were analyzed to demonstrate the absence of interferences originating from ISTD. A sample was considered to have interference if the average peak area of the blank + ISTD samples (n=5) was greater than 20% of the average LOQ peak area from the five calibration curves (n=5).

Matrix Effect

Matrix effects were evaluated using a modified version of the method described by Matuszewski and colleagues (Matuszewski, 2003). Three sets of samples were created for each target analyte. As described by Matuszewski and colleagues, comparative calculations were used to evaluate the data:

 $ME(\%) = B/A \times 100$

 $RE(\%) = C/B \times 100$

 $PE(\%) = C/A \times 100$

where A, B, and C = the mean responses as represented by the area under the peaks for target and internal standard quantitative ions, ME = matrix effect, RE = recovery efficiency, and PE =process efficiency. Type A samples are target analytes and ISTD in mobile phase. Type B samples are hair matrix extract post extraction spiked with target analytes and ISTD. Type C samples are hair matrix spiked with ISTD and target analytes prior to extraction. The mean responses for A, B, and C were determined across these 10 hair lots. The assessment of a relative matrix effect was determined by comparing the MEs between the 10 lots. The variability (%CV) in the MEs between lots is considered to be a measure of the relative matrix effect.

Validation Results

Two fragment ions were monitored for each drug analyte as a quantitative ion and qualifying ion. One fragment ion was monitored for the ISTD. Fragment ions and optimized parameters for each analyte and ISTD are shown in Table A-1.

Analyte	Transitions	DP	CE	CxP
	Monitored			
Heroin	370.18>165.3*	101	68	6
	370.18>211.3	101	39	12
Heroin-D ₉	379.27>212.1	121	45	10
6-AM	328.2>165.3*	100	54	9
	328.2>211.2	100	37	11
6-AM-D ₆	334.2>165.2	121	53	8
Morphine	286.2>152.2*	91	80	12
	286.1>128.2	91	79	20
Morphine-D ₆	292.2>152.1	116	91	24
MAMP	150.2>91.3*	45	27	20
	150.2>119.3	45	16	10
MAMP-D ₅	155.1>121.1	46	15	4
AMP	136.2>119.2	45	12	19
	136.2>91.2*	45	23	10
AMP-D ₆	142.1>125.1	66	13	6

Table A-1. Transitions monitored and optimized parameters for each drug analyte.

*Fragment ion used for quantification

Calibration Curve

Analyst software (version 1.4.2) was used for data reduction. Summary of calibration

ranges, correlation coefficients (r²), ISTD and QC concentrations of each drug analyte in hair are

shown in Table A-2. A linear regression (weighted 1/x) calibration model was established for all

analytes except MAMP, which was quadratic (weighted 1/x).

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Analyte	r ²	Calibration points	ISTD Conc.	QC Conc. (pg/mg)
		(pg/mg)	(pg/mg)	
Heroin	0.9997	25, 50, 100, 200, 500,	50	75, 300, 1200, 8000
		1000, 2000, 10000		
MAMP	0.9992	25, 50, 100, 200, 500,	50	75, 300, 1200, 8000
		1000, 2000, 10000		
6-AM	0.9995	2.5, 5, 10, 20, 50, 75	5	7.5, 30
Morphine	0.9945	2.5, 5, 10, 20, 50, 75,	5	7.5, 30, 120
		200		
AMP	0.9992	50, 75, 200, 500, 2000	5	120, 1600

Table A-2. Summary of r^2 , calibration, ISTD, and QC sample concentration for each analyte.

Precision and Accuracy

The precision and accuracy results for QC samples of each analyte are shown in Table A-3. Each QC level was analyzed in triplicate over five runs. The average overall within-run precision was represented by a %CV \leq 7.1 for all compounds. The average overall between-run precision was represented by a %CV \leq 11.4 for all compounds. The % accuracy and its

associated %CV for all analytes in hair were 98.1-110.7 with %CV of accuracy ≤ 11.2 .

	Precision Ev	aluation	Accuracy Evaluation			
Analyte	Average Overall Within- Run %CV	Average Overall Between- Run %CV	Average Overall Accuracy	Accuracy %CV		
Heroin	2.5	3.6	98.1	4.7		
MAMP	2.5	5.7	107.0	9.2		
6-AM	2.0	2.5	98.2	4.2		
Morphine	7.1	11.4	110.7	11.2		
AMP	4.2	3.3	108.0	5.1		

Table A-3. Evaluation of precision and accuracy of each analyte by LC-MS/MS.

Limit of Quantification (LOQ)/Limit of Detection (LOD)

Table A-4 presents the LOQ results for all analytes in hair. All LOQs were acceptable,

with %CVs ranging from 12.6-19, with the exception of heroin with a %CV of 22.7. Accuracies

ranged from 86.9-117.2% with accuracy %CV for all analytes \leq 9.9.

Analyte	N	Target Conc. (pg/mg)	Average overall %CV	Average overall %Accuracy	Accuracy %CV
Heroin	5	25	22.7	106.0	4.4
MAMP	5	25	12.6	117.2	2.5
6-AM	5	2.5	14.2	107.6	2.5
Morphine	5	2.5	19.0	100.6	9.9
AMP	5	50	18.9	86.9	2.9

Table A-4. LOQ target concentrations, average overall %CV and %Accuracy and Accuracy %CV.

Carryover

Carryover was not observed for heroin and MAMP at 10,000 pg/mg or for 6-AM, AMP, and morphine at 2,000 pg/mg.

Interference

The average peak area of the ten drug-free hair lots without addition of ISTD were all less than 20% of the average peak areas of the LOQ for each analyte, indicating no interference from the hair matrix. One of the drug-free hair samples was positive for amphetamine and was not used in the interference calculation, therefore the amphetamine interference calculations are based on an n=9. No interference from ISTD was detected either.

Matrix Effect

The concentration used for matrix effects for 6-AM, AMP, and morphine was 50 pg/mg. MAMP and heroin concentration used for matrix effects was 500 pg/mg. Table A-5 shows the matrix effect, recovery efficiency, and process efficiency for each analyte. Heroin, MAMP, and AMP experienced suppression with %ME less than 100% while 6-AM and morphine experienced enhancement with matrix effects greater than 100%. The high and low %RE and %PE for heroin and 6-AM respectively indicate likely conversion of heroin to 6-AM during the extraction process.

	Target	Ion Resp	onse	ISTD Io	n Respoi	nse	Relative Matrix Effect*
Analyte	%ME	%RE	%PE	%ME	%RE	%PE	%CV for B/A
Heroin	68.1	16.9	11.5	67.0	15.8	10.6	10.8
MAMP	84.9	76.8	65.3	83.7	78.2	65.5	10.0
6-AM	154.5	332.4	513.7	143.7	333.2	478.8	20.8
Morphine	110.2	170.2	187.6	100.5	37.3	37.5	18.0
AMP	83.3	55.7	46.5	102.0	57.1	58.3	12.0

* Heroin, MAMP, 6-AM, Morphine n=10 AMP n=9

 Table A-5. Summary of matrix effects for each analyte.

References

Ropero-Miller, J., Stout, P. (January 2009) Analysis of cocaine and analytes in human hair: evaluation of concentration ratios in different hair types, cocaine surfaces, drug-user populations, and surface-contaminated specimens. NIJ Final Report. Retrieved on 5/28/2015 from https://www.ncjrs.gov/pdffiles1/nij/grants/225531.pdf.

Matuszewski BK, Constanzer ML, Chavez-Eng CM. Strategies for the assessment of matrix effect in quantitative bioanalytical methods based on HPLC-MS/MS. Anal Chem. 2003 75(13):3019-30.

and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

E1	Not Decont Bench	aminated Shampoo	Deconta Bench	minated Shampoo	U1		Not Decon Bench	taminated Shampoo	Deconta Bench	minated Shampoo
TPO	3.6	•		.4		TP0	21	•		.1
TP1	12775).5		TP1	22			.7
TP2	8325	0.0	554	7.5		TP2	n/	a	n,	/a
TP3	2052	5.0	435	5.0		TP3	31	.2	10).0
TP4	22500.0	16525.0	5570.0	4997.5		TP4	24.7	20.1	9.1	44.1
TP5	23375.0	10600.0	6602.5	6002.5		TP5	22.1	11.7	5.3	2.7
TP6	26050.0	11325.0	8340.0	6392.5		TP6	27.5	9.6	6.9	70.6
TP7										
	19550.0	6945.0	7722.5	4500.0		TP7	24.3	1.5	2.1	0.0
TP8	15100.0	4247.5	4015.0	3155.0		TP8	31.8	6.7	12.0	7.0
E2	Not Decont			minated	U2		Not Decon			minated
	Bench	Shampoo	Bench	Shampoo			Bench	Shampoo	Bench	Shampoo
TP0	3.9	9	3.	.6		TP0	3.	5	3.	.5
TP1	21475	50.0	63	8.5		TP1	0.	0	0	.0
TP2	11075	50.0	189	50.0		TP2	n/	a	n,	/a
TP3	4967	5.0	152	75.0		TP3	5.	7	3	.2
TP4	74575.0	52275.0	22925.0	19900.0		TP4	5.0	4.6	5.3	5.8
TP5	63925.0	33575.0	17025.0	18050.0		TP5	0.0	0.0	0.0	0.0
TP6	60675.0	36075.0	26550.0	17550.0		TP6	0.0	0.0	0.1	1.4
TP7	51050.0	13275.0	22500.0	8265.0		TP7	0.0	0.0	0.0	0.0
TP8	36825.0	9985.0	16775.0	5850.0		TP8	6.1	6.1	5.9	6.1
E3	Not Decont	aminated	Deconta	minated	U3		Not Decon	taminated	Deconta	minated
20	Bench	Shampoo	Bench	Shampoo	0.0		Bench	Shampoo	Bench	Shampoo
TP0	4.6	•		.6		TP0	343	•		8.8
TP1	11350			9.1		TP1	321			2.8
TP2	7075		999	0.0		TP2	n/		n,	
TP3	4177	'5.0	110	25.0		TP3	342	2.8	16	0.5
TP4	46100.0	34475.0	7765.0	9402.5		TP4	270.5	199.5	140.3	135.3
TP5	46850.0	26400.0	9087.5	9275.0		TP5	317.0	189.3	183.3	108.5
TP6	51800.0	27875.0	14550.0	11575.0		TP6	334.5	157.3	192.0	83.7
	0100010						333.3			13.7
TP7	46875.0	12175 0	11125.0	58375						
TP7 TP8	46875.0 29200.0	12175.0 6395.0	11125.0 9755.0	5837.5 3550.0		TP7 TP8		33.3 19.8	149.8 167.0	
TP8	29200.0	6395.0	9755.0	3550.0		TP7 TP8	339.3	19.8	149.8 167.0	10.7
TP8	29200.0 Not Decont	6395.0 taminated	9755.0 Deconta	3550.0 minated	U4		339.3 Not Decont	19.8 taminated	167.0 Deconta	10.7 minated
TP8 E4	29200.0 Not Decont Bench	6395.0 caminated Shampoo	9755.0 Deconta Bench	3550.0 minated Shampoo	U4	TP8	339.3 Not Decont Bench	19.8 taminated Shampoo	167.0 Deconta Bench	10.7 minated Shampoo
TP8 E4 TP0	29200.0 Not Decont Bench 4.2	6395.0 caminated Shampoo 1	9755.0 Deconta Bench 3.	3550.0 minated Shampoo .6	U4	TP8 TP0	339.3 Not Decont Bench 122	19.8 taminated Shampoo 2.8	167.0 Deconta Bench 19	10.7 minated Shampoo 2.0
TP8 E4 TP0 TP1	29200.0 Not Decont Bench 4.2 6067	6395.0 caminated Shampoo 1 25.0	9755.0 Deconta Bench 3. 33	3550.0 minated Shampoo .6 8.8	U4	TP8 TP0 TP1	339.3 Not Decont Bench 122 91	19.8 taminated Shampoo 2.8 .3	167.0 Deconta Bench 192 29	10.7 minated Shampoo 2.0 9.7
TP8 E4 TP0	29200.0 Not Decont Bench 4.2	6395.0 caminated Shampoo 1 25.0	9755.0 Deconta Bench 3.	3550.0 minated Shampoo .6 8.8	U4	TP8 TP0	339.3 Not Decont Bench 122	19.8 taminated Shampoo 2.8 .3	167.0 Deconta Bench 19	10.7 minated Shampoo 2.0 9.7
TP8 E4 TP0 TP1	29200.0 Not Decont Bench 4.2 6067	6395.0 caminated Shampoo 1 25.0 60.0	9755.0 Deconta Bench 3. 33 293	3550.0 minated Shampoo .6 8.8	U4	TP8 TP0 TP1	339.3 Not Decont Bench 122 91	19.8 taminated Shampoo 2.8 .3 a	167.0 Deconta Bench 19. 29 n,	10.7 minated Shampoo 2.0 9.7
TP8 E4 TP0 TP1 TP2	29200.0 Not Decont Bench 4.2 6067 5155	6395.0 caminated Shampoo 1 25.0 60.0	9755.0 Deconta Bench 3. 33 293	3550.0 minated Shampoo .6 3.8 30.0	U4	TP8 TP0 TP1 TP2	339.3 Not Decon Bench 122 91 n/	19.8 taminated Shampoo 2.8 .3 a	167.0 Deconta Bench 19. 29 n,	10.7 minated Shampoo 2.0 9.7 /a
TP8 E4 TP0 TP1 TP2 TP3 TP4	29200.0 Not Decont Bench 4.2 6067 5155 2170 42000.0	6395.0 taminated Shampoo 1 (5.0 (0.0 10.0 14100.0	9755.0 Deconta Bench 33 293 540 5995.0	3550.0 minated Shampoo .6 3.8 30.0 07.5 4040.0	U4	TP8 TP0 TP1 TP2 TP3 TP4	339.3 Not Deconi Bench 122 91 n/ 147 86.8	19.8 taminated Shampoo 2.8 .3 'a 7.8 60.9	167.0 Deconta Bench 19: 29 n, 67 67.1	10.7 minated Shampoo 2.0 9.7 /a 7.1 41.9
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5	29200.0 Not Decont Bench 4.2 6067 5155 2170 42000.0 34275.0	6395.0 taminated Shampoo 1 5.0 10.0 14100.0 11340.0	9755.0 Deconta Bench 33 293 540 5995.0 6622.5	3550.0 minated Shampoo .6 8.8 00.0 17.5 4040.0 4252.5	U4	TP8 TP0 TP1 TP2 TP3 TP4 TP5	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7	19.8 taminated Shampoo 2.8 .3 'a 7.8 60.9 59.1	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4	10.7 minated Shampoo 2.0 0.7 /a 7.1 41.9 41.5
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0	6395.0 taminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5	U4	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5	19.8 taminated Shampoo 2.8 3 3 7.8 60.9 59.1 71.8	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2	10.7 minated Shampoo 2.0 0.7 /a 7.1 41.9 41.5 30.0
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0	6395.0 taminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0 6765.0	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5	U4	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5 62.3	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7	10.7 minated Shampoo 2.0 0.7 /a 7.1 41.9 41.5 30.0 20.7
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0	6395.0 taminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5	U4	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5	19.8 taminated Shampoo 2.8 3 3 7.8 60.9 59.1 71.8	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2	10.7 minated Shampoo 2.0 0.7 /a 7.1 41.9 41.5 30.0
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0	6395.0 taminated Shampoo 1 5.0 00.0 14100.0 11340.0 9127.5 2832.5 1130.0	9755.0 Deconta Bench 3 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5	U4	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5 62.3	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1	167.0 Deconta Bench 19 29 n, 67 67.1 38.4 55.2 36.7 54.0	10.7 minated Shampoo 2.0 9.7 /a 41.9 41.5 30.0 20.7
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.2 6067 5155 2170 42000.0 34275.0 34275.0 34275.0 32525.0 21900.0	6395.0 taminated Shampoo 1 5.0 00.0 14100.0 11340.0 9127.5 2832.5 1130.0	9755.0 Deconta Bench 3 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0	3550.0 minated Shampoo .6 .8 80.0 17.5 4040.0 4252.5 3607.5 1262.5 541.0		TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1	167.0 Deconta Bench 19 29 n, 67 67.1 38.4 55.2 36.7 54.0	10.7 minated Shampoo 2.0 0.7 /a 41.9 41.5 30.0 20.7 13.3 minated
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.2 6067 5155 2170 42000.0 34275.0 34275.0 34275.0 32525.0 21900.0	6395.0 taminated Shampoo 1 5.0 00.0 14100.0 11340.0 9127.5 2832.5 1130.0 taminated Shampoo	9755.0 Deconta Bench 3. 32 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 2000.0	3550.0 minated Shampoo .6 .8 80.0 17.5 4040.0 4252.5 3607.5 1262.5 541.0 minated		TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decom	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo	167.0 Deconta Bench 19: 29: 0, 67: 67:1 38:4 55:2 36:7 54:0 Deconta Bench	10.7 minated Shampoo 2.0 0.7 /a 41.9 41.5 30.0 20.7 13.3 minated
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0	29200.0 Not Decont Bench 4.2 60067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.8	6395.0 caminated Shampoo 1 5.0 0.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8	9755.0 Deconta Bench 3. 3293 540 5995.0 6622.5 10600.0 6765.0 6765.0 6765.0 6765.0 3. Deconta Bench 3.	3550.0 minated Shampoo .6 8.8 00.0 17.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0	339.3 Not Deconi Bench 122 91 147 86.8 75.7 101.5 62.3 68.6 08.6 Not Deconi Bench 88	19.8 taminated Shampoo 2.8 3 3 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4	167.0 Deconta Bench 19: 29; 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75	10.7 minated Shampoo 2.0 9.7 /a 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1	29200.0 Not Decont Bench 4.2 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.8 4517	6395.0 caminated Shampoo 1 (5.0 0.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8 (5.0	9755.0 Deconta Bench 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 6765.0 6300.0 0 6300.0 3 Bench 3 46	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1	339.3 Not Decom Bench 122 91 147 86.8 75.7 101.5 62.3 68.6 Not Decom Bench 88 60	19.8 taminated Shampoo 2.8 3 3 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 .2	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49	10.7 minated Shampoo 2.0 7.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 0.3
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535	6395.0 caminated Shampoo 1 (5.0 0.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8 (5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	9755.0 Deconta Bench 3 3293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 6300.0 Deconta Bench 3 46 213	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 95.0		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2	339.3 Not Decom Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decom Bench 88 60 n/	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 .2 a	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49 n,	10.7 minated Shampoo 2.0 7.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 0.3 /a
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2 TP3	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8 5.0 0.0 5.0 5.0 5.0 5.0 5.0 5.0	9755.0 Deconta Bench 3 3293 540 5995.0 6622.5 10600.0 6765.0 6300.0 Deconta Bench 3 46 213 293	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 95.0 95.0		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 a 8	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49 n, 49	10.7 minated Shampoo 2.0 7.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 3.3 /a 9.8
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2 TP3 TP4	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.8 4517 3535 1317 15675.0	6395.0 taminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 taminated Shampoo 8 5.0 0.0 15.0 10.0 11340.0 9127.5 2832.5 1130.0 10525.0	9755.0 Deconta Bench 3 3293 540 5995.0 6622.5 10600.0 6765.0 6300.0 Deconta Bench 3. 46 213 293 2592.5	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 35.0 35.0 35.0 2785.0		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 2 a 8 80.5	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49 n, 49 53.2	10.7 minated Shampoo 2.0 0.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2 TP3	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8 5.0 0.0 5.0 5.0 5.0 5.0 5.0 5.0	9755.0 Deconta Bench 3 3293 540 5995.0 6622.5 10600.0 6765.0 6300.0 Deconta Bench 3 46 213 293	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 95.0 95.0		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 a 8	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49 n, 49	10.7 minated Shampoo 2.0 7/4 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 3.3 /a 9.8
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2 TP3 TP4	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.8 4517 3535 1317 15675.0	6395.0 taminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 taminated Shampoo 8 5.0 0.0 15.0 10.0 11340.0 9127.5 2832.5 1130.0 10525.0	9755.0 Deconta Bench 3 3293 540 5995.0 6622.5 10600.0 6765.0 6300.0 Deconta Bench 3. 46 213 293 2592.5	3550.0 minated Shampoo .6 8.8 90.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 35.0 35.0 35.0 2785.0		TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 2 a 8 80.5	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 75 49 n, 49 53.2	10.7 minated Shampoo 2.0 0.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3
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TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 34275.0 34275.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 10525.0 7437.5 6170.0 1985.0	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 0 6765.0 6300.0 0 200 2592.5 2592.5 2510.0 4125.0 3105.0	3550.0 minated Shampoo .6 3.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 55.0 2785.0 2462.5 2825.0 656.0	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP6 TP7 TP8 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decont Bench 117.5 98.2 78.9 86.9 Not Decont Bench 117.5 1	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 8 80.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 3	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0.0 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	10.7 minated Shampoo 2.0 9.7 /a 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 0.8 37.3 25.2 24.8 12.8 14.5 minated Shampoo 2.7 /a /a /a /a /a /a /a /a /a /a /a /a /a
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 34275.0 34275.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 10525.0 7437.5 6170.0 1985.0	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 0 6765.0 6300.0 0 200 2592.5 2592.5 2510.0 4125.0 3105.0	3550.0 minated Shampoo .6 3.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 55.0 2785.0 2462.5 2825.0 656.0	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decont Bench 117.5 117	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 8 80.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 3	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0.0 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	10.7 minated Shampoo 2.0 0.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3 25.2 24.8 12.8 14.5 30.0 20.7 13.3 minated Shampoo 2.1 24.8 12.8 14.5 12.9 24.8 12.8 14.5 12.0 21.1 21.1 21.1 21.1 21.1 21.1 21.1
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 10525.0 7437.5 6170.0 1985.0	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 0 6765.0 6300.0 0 200 2592.5 2592.5 2510.0 4125.0 3105.0	3550.0 minated Shampoo .6 3.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 55.0 2785.0 2462.5 2825.0 656.0	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP6 TP7 TP8 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	339.3 Not Decont Bench 122 91 n/ 147 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decont Bench 117.5 98.2 78.9 86.9 Not Decont Bench 117.5 1	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 8 80.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 3	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0.0 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	10.7 minated Shampoo 2.0 9.7 /a 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 0.8 37.3 25.2 24.8 12.8 14.5 minated Shampoo 2.7 /a /a /a /a /a /a /a /a /a /a /a /a /a
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 1130.0 9127.5 10525.0 7437.5 6170.0 1985.0	9755.0 Deconta Bench 3 33 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 0 6765.0 6300.0 0 200 2592.5 2592.5 2510.0 4125.0 3105.0	3550.0 minated Shampoo .6 3.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 minated Shampoo .6 5.1 55.0 2785.0 2462.5 2825.0 656.0	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3	339.3 Not Decont Bench 122 91 1/7 86.8 75.7 101.5 62.3 68.6 Not Decont Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decont Bench 16 9. n/ 127 102.5 103.	19.8 taminated Shampoo 2.8 3 3 a 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 2 3 8 80.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 5 a 7.7	167.0 Deconta Bench 19: 25 0, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6, 0, 0, 0, 49 54.1	10.7 minated Shampoo 2.0 9.7 /a 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3 25.2 24.8 12.8 14.5 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 minated Shampoo 2.0 7 13.3 Shampoo 2.0 7 13.3 2.5 2 2.4.8 12.8 14.5 12.8 14.5 12.8 14.5 12.9 14.5 12.0 12.7 13.3 2.5 2 2.4.8 12.8 14.5 12.8 14.5 12.8 14.5 12.9 14.5 12.9 12.9 12.1 12.1 12.1 13.3 12.5 12.2 12.4 14.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0 12225.0	6395.0 aminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 3 caminated Shampoo 8 5.0 10525.0 7437.5 6170.0 1985.0 0.0 0.0	9755.0 Deconta Bench 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 6765.0 6300.0 6300.0 2323 2592.5 2510.0 4125.0 3105.0 2822.5	3550.0 minated Shampoo 6 8.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 55.0 55.0 55.0 2785.0 2462.5 2825.0 656.0 142.3	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP6 TP7 TP8	339.3 Not Decom Bench 122 91 1/1 86.8 75.7 101.5 62.3 68.6 Not Decom Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decom Bench 16 9. 12 17.8 10.7	19.8 taminated Shampoo 2.8 3 a 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 .2 a 8 880.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 5 a a .7 10.9 2.9	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0, 0, 4, 75 75 49 49 54.1	10.7 minated Shampoo 2.0 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3 25.2 24.8 12.8 14.5 minated Shampoo 2.1 /a 9 6.3 0.1
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0 12225.0	6395.0 aminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 3 caminated Shampoo 8 5.0 10525.0 7437.5 6170.0 1985.0 0.0 0.0	9755.0 Deconta Bench 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 6765.0 6300.0 6300.0 2323 2592.5 2510.0 4125.0 3105.0 2822.5	3550.0 minated Shampoo 6 8.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 55.0 55.0 55.0 2785.0 2462.5 2825.0 656.0 142.3	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP6 TP7 TP8 TP1 TP2 TP3 TP4 TP5 TP6 TP3 TP4 TP5 TP6	339.3 Not Decom Bench 122 91 1/1 86.8 75.7 101.5 62.3 68.6 Not Decom Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decom Bench 16 9. 12 17.8 10.7 12.4	19.8 taminated Shampoo 2.8 3 3 4 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 .2 a 8 8 80.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 a 7 .7 7 .7 7 .0 9 2.9 3.1	167.0 Deconta Bench 19: 29: n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0, n, 49 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	10.7 minated Shampoo 2.0 7.1 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3 25.2 24.8 12.8 12.8 14.5 minated Shampoo 2.1 /a 9 6.3 0.1 0.6
TP8 E4 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	29200.0 Not Decont Bench 4.: 6067 5155 2170 42000.0 34275.0 34775.0 32525.0 21900.0 Not Decont Bench 3.: 4517 3535 1317 15675.0 16625.0 18350.0 16500.0 12225.0	6395.0 caminated Shampoo 1 5.0 0.0 14100.0 11340.0 9127.5 2832.5 1130.0 caminated Shampoo 8 Shampoo 8 5.0 10.0 10.525.0 7437.5 6170.0 1985.0 0.0 1985.0 0.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 6170.0 1985.0 0.0 7437.5 7457.5	9755.0 Deconta Bench 3 293 540 5995.0 6622.5 10600.0 6765.0 6300.0 0 6765.0 6300.0 6300.0 2323 2592.5 2510.0 4125.0 3105.0 2822.5	3550.0 minated Shampoo 6 8.8 00.0 77.5 4040.0 4252.5 3607.5 1262.5 541.0 55.0 55.0 55.0 2785.0 2462.5 2825.0 656.0 142.3	U5	TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP6 TP7 TP8 TP0 TP1 TP2 TP3 TP6 TP7 TP8	339.3 Not Decom Bench 122 91 1/1 86.8 75.7 101.5 62.3 68.6 Not Decom Bench 88 60 n/ 82 83.2 117.5 98.2 78.9 86.9 Not Decom Bench 16 9. 12 17.8 10.7	19.8 taminated Shampoo 2.8 3 a 7.8 60.9 59.1 71.8 37.2 23.1 taminated Shampoo .4 .2 a 8 880.5 45.3 34.3 36.8 20.9 taminated Shampoo .5 5 5 a a .7 10.9 2.9	167.0 Deconta Bench 19: 29 n, 67 67.1 38.4 55.2 36.7 54.0 Deconta Bench 53.2 50.3 47.8 44.9 54.1 Deconta Bench 6 0, 0, 4, 75 75 49 49 54.1	10.7 minated Shampoo 2.0 7.7 /a 41.9 41.5 30.0 20.7 13.3 minated Shampoo 5.6 9.3 /a 9.8 37.3 25.2 24.8 12.8 14.5 minated Shampoo 2.1 /a 9.6.3 0.1

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1	Not Decon		Deconta		U1		ontaminated		minated
	Bench	Shampoo	Bench	Shampoo		Bench	Shampoo	Bench	Shampo
TP0	1.	.9	2.	.5	TP0	:	10.8	6	.7
TP1	12	8.8	12	.9	TP1		8.5	3	.1
TP2	72	.1	18	.7	TP2		n/a	n	/a
TP3	75	5.7	14	.8	TP3		17.5	11	1.7
TP4	297.8	50.6	21.7	12.9	TP4	13.4	8.4	6.6	6.6
TP5	403.0	24.5	47.0	7.8	TP5	9.6	5.2	2.8	2.4
TP6	304.0	33.7	63.4	29.3	TP6	15.5	9.8	8.9	8.5
TP7	196.0	21.0	58.2	13.0	TP7	18.5	11.0	10.8	9.4
TP8	255.0	26.0	45.3	18.9	TP8	12.7	5.7	8.3	6.1
2	Not Decon Bench	taminated Shampoo	Deconta Bench		U2	Not Deco Bench	ontaminated	Deconta Bench	minated Shampo
TP0	3. 3		2.	Shampoo	TPO		Shampoo 2.5		.0
TP1	10		13		TP1		0.5		.4
TP2	12		22		TP2		n/a		/a
TP3	46	4.3	82	.2	TP3		9.0	8	.6
TP4	492.8	237.0	127.0	87.6	TP4	2.6	2.6	2.9	3.2
TP5	599.0	162.8	120.5	56.9	TP5	0.0	#DIV/0!	0.0	0.0
TP6	1180.0	124.8	275.5	77.7	TP6	5.8	5.5	5.7	5.7
TP7	1357.5	60.3	296.3	34.0	TP7	8.2	8.1	8.0	7.9
TP8		56.4	296.5 390.8	36.3	TP8	8.2 4.0	3.8	8.0 4.1	7.9 4.1
170	1157.5	30.4	390.8	30.3	115	4.0	3.6	4.1	4.1
3	Not Decon Bench	taminated Shampoo	Deconta Bench	minated Shampoo	U3	Not Decc Bench	ontaminated Shampoo	Deconta Bench	minated Shamp
TP0	2		2.		TPO		23.8	16	5.7 .7
TP1	10		12		TP1		27.1		0.3
TP2	17		31	-	TP2		n/a		/a
							-		
TP3	15		44		TP3		33.2		1.4
TP4	164.0	139.3	27.1	35.0	TP4	25.7	19.7	14.2	13.1
TP5	201.8	98.8	29.5	19.6	TP5	27.9	15.8	15.8	7.8
TP6	301.0	80.6	107.0	52.4	TP6	31.2	16.6	19.4	11.4
TP7	310.0	47.7	101.2	20.0	TP7	37.8	10.8	19.5	9.3
TP8	453.8	35.4	104.5	23.0	TP8	30.4	4.7	17.3	4.8
4	Not Decontaminated		Deconta		U4		ontaminated		minated
	Bench	Shampoo	Bench	Shampoo		Bench	Shampoo	Bench	Shamp
TP0	3.		2.		TP0		24.2		2.7
TP1	62	.2	12	.1	TP1	:	15.0	7	.1
TP2	42	.5	14	.7	TP2		n/a	n	/a
TP3	25	.9	12	.2	TP3	3	38.6	18	3.6
TP4	311.3	27.1	16.8	5.7	TP4	17.3	12.7	14.0	11.2
TP5	108.5	9.3	10.8	0.0	TP5	14.2	11.4	7.4	7.6
TP6	153.8	24.4	41.6	18.6	TP6	25.1	16.8	13.9	10.1
TP7	135.3	6.3	32.4	3.1	TP7	21.6	13.6	15.8	12.0
TP8	181.0	13.1	49.4	11.2	TP8	15.3	6.4	15.8	5.6
i	Not Decon Bench	taminated Shampoo	Deconta Bench	minated Shampoo	U5	Not Decc Bench	ontaminated Shampoo	Deconta Bench	minated Shamp
TDO					TDO				
TP0	3.		2.		TP0		12.6		.2
TP1		.2	12		TP1		9.3		.8
TP2		5.4	13		TP2		n/a		/a
TP3	22	4	9.	1	TP3	:	18.1	13	3.1
TP4	88.8	16.6	2.7	1.7	TP4	13.0	9.0	7.7	6.4
TP5	111.5	2.5	3.4	0.0	TP5	12.5	4.5	4.7	2.1
TP6	157.0	22.6	53.1	18.4	TP6	17.6	9.2	10.5	8.1
TP7	92.0	7.1	31.3	2.5	TP7	19.3	10.1	10.5	9.3
TP7 TP8	92.0 154.0	7.1 11.4	40.2	10.8	TP7	19.5	5.3	9.5	9.3 5.2
	-								
					U6	Not Deco Bench	ontaminated Shampoo	Deconta Bench	iminated Shamp
					TPO		5.7		.4
AMP					TP1		3.1		.1
pg/mg hair					TP2		n/a		/a
PD/ 115 1101									
					TP3		10.4		.3
					TP4	5.4	4.3	3.9	3.7
					TP5	2.0	0.5	0.0	0.0
mendix to F	inal Sum	mary for 7	2013-DN-	BX-K021	TP6	8.0	6.6	6.4	5.9
ppendix to F		mary for 2	2013-DN-	BX-K021		8.0 10.9	6.6 9.0	6.4 8.8	5.9 8.3

TP8

6.8

4.4

4.9

4.5

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	Not Decont	taminated	Decontai	minated	U1	Not Decon	taminated	Deconta	minated
	Bench	Shampoo	Bench	Shampoo		Bench	Shampoo	Bench	Shampoo
TP0	0.0	0	0.	0	TPO	0.	0	0.	.0
TP1	1222	50.0	10	.5	TP1	2.	2	2.	.2
TP2	7362	25.0	89	.6	TP2	n/	'a	n,	/a
TP3	707	7.5	60	.4	TP3	3.	1		.3
TP4	6540.0	1687.5	78.1	56.8	TP4	10.8	10.8	10.8	11.3
TP5	6680.0	172.0	79.7	31.5	TP5	0.0	0.0	0.0	0.0
TP6	6025.0	77.6	82.8	25.7	TP6	0.0	0.0	0.0	0.0
TP7	5302.5	20.7	99.1	4.8	TP7	3.9	3.9	3.9	3.9
TP8	5617.5	10.0	49.8	9.0	TP8	7.8	3.9 7.5	3.9 7.2	3.9 8.2
110	5017.5	10.0	49.8	5.0	110	7.0	7.5	1.2	0.2
E2	Not Decont		Decontai		U2	Not Decon			minated
TDO	Bench	Shampoo	Bench	Shampoo	TDO	Bench	Shampoo	Bench	Shampo
TP0	0.0		0.		TPO	104			9.6
TP1	2052		37		TP1	150		17	
TP2	9720		990		TP2	n/		n/	
TP3	2305		694		TP3	25:		7.	
TP4	27450.0	7617.5	1205.0	752.8	TP4	86.4	31.0	15.0	16.2
TP5	26300.0	1200.0	636.0	279.8	TP5	102.6	9.5	6.0	2.8
TP6	21000.0	586.0	1052.5	188.8	TP6	109.5	0.6	1.1	0.0
TP7	17625.0	83.7	1095.0	54.4	TP7	91.8	5.4	11.3	4.6
TP8	19550.0	37.8	1059.8	47.9	TP8	102.6	7.5	11.7	8.1
3	Not Decont	taminated	Decontai	minated	U3	Not Decon	taminated	Deconta	minated
	Bench	Shampoo	Bench	Shampoo		Bench	Shampoo	Bench	Shampo
TP0	0.0	•	0.		тро	260		117	
TP1	9487		9.		TP1	198			5.0
TP1	4357		408	-	TP1	198 n/		50. n/	
TP3			408 500		TP2 TP3	n/ 321		n/ 840	
	1207								
TP4	14875.0	2765.0	422.3	320.8	TP4	1765.0	668.8	1497.5	415.5
TP5	13350.0	457.8	405.5	167.3	TP5	1940.0	486.5	566.8	273.8
TP6	14825.0	259.8	577.3	114.5	TP6	1967.5	429.0	652.8	189.3
TP7	14675.0	85.5	495.5	43.3	TP7	1720.0	150.3	624.5	85.0
TP8	9952.5	22.4	460.0	27.7	TP8	1712.5	38.9	627.0	28.4
E4	Not Decont	taminated	Decontai	minated	U4	Not Decon	taminated	Deconta	minated
E4	Not Decont Bench	taminated Shampoo	Decontai Bench	minated Shampoo	U4	Not Decon Bench	taminated Shampoo	Deconta Bench	iminated Shampo
E4 TPO		Shampoo		Shampoo	U4 TPO		Shampoo	Bench	
	Bench	Shampoo 0	Bench	Shampoo 0	-	Bench	Shampoo 5.8	Bench	Shampo 7.6
TP0	Bench 0.0	Shampoo 0 10.0	Bench 0.	Shampoo 0 2	ТРО	Bench 25	Shampoo 5.8 5.8	Bench 17	Shampo 7.6 .0
TPO TP1	Bench 0.(6370	Shampoo 0 00.0 25.0	Bench 0. 8.	Shampoo 0 2 1.7	TP0 TP1	Bench 25 16	Shampoo 5.8 5.8 ⁄a	Bench 17 8.	Shampc 7.6 .0 /a
TPO TP1 TP2	Bench 0.0 6370 4762	Shampoo 0 00.0 25.0	Bench 0. 8. 101	Shampoo 0 2 1.7	TPO TP1 TP2	Bench 25 16 n/	Shampoo 5.8 5.8 ⁄a	Bench 17 8. n/	Shampo 7.6 .0 /a
TPO TP1 TP2 TP3 TP4	Bench 0.0 6370 4762 822 21625.0	Shampoo 0 00.0 25.0 5.0 1120.0	Bench 0. 8. 101 185 206.0	Shampoo 0 2 1.7 5.8 86.5	TP0 TP1 TP2 TP3 TP4	Bench 25 16 n/ 23 27.2	Shampoo 5.8 5.8 7a 5.1 17.2	Bench 17 8. n/ 8. 18.9	Shampo 7.6 .0 /a .7 13.4
TP0 TP1 TP2 TP3 TP4 TP5	Bench 0.0 6370 4762 8229 21625.0 10407.5	Shampoo 0 25.0 5.0 1120.0 110.4	Bench 0. 8. 101 185 206.0 214.8	Shampoo 0 2 1.7 5.8 86.5 45.9	TP0 TP1 TP2 TP3 TP4 TP5	Bench 25 16 n/ 23 27.2 22.9	Shampoo 5.8 5.8 7a 5.1 17.2 1.8	Bench 17 8. n, 8. 18.9 8.9	Shampo 7.6 .0 /a .7 13.4 1.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0	Shampoo 0 25.0 5.0 1120.0 110.4 51.6	Bench 0. 8. 101 185 206.0 214.8 286.3	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7	TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 25 16 n/ 23 27.2 22.9 6.0	Shampoo 5.8 5.8 7 3.1 17.2 1.8 0.0	Bench 17 8. n/ 8. 18.9 8.9 0.0	Shampo 7.6 .0 /a .7 13.4 1.0 0.0
TP0 TP1 TP2 TP3 TP4 TP5	Bench 0.0 6370 4762 8229 21625.0 10407.5	Shampoo 0 25.0 5.0 1120.0 110.4	Bench 0. 8. 101 185 206.0 214.8	Shampoo 0 2 1.7 5.8 86.5 45.9	TP0 TP1 TP2 TP3 TP4 TP5	Bench 25 16 n/ 23 27.2 22.9	Shampoo 5.8 5.8 7a 5.1 17.2 1.8	Bench 17 8. n, 8. 18.9 8.9	Shampo 7.6 .0 /a .7 13.4 1.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5	Shampoo 0 25.0 5.0 1120.0 110.4 51.6 3.7	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 7/ 23 27.2 22.9 6.0 17.9	Shampoo 5.8 5.8 7a 5.1 17.2 1.8 0.0 4.5	Bench 17 8. n/ 8.9 8.9 0.0 7.4	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8	Bench 0. 8. 101 185 206.0 214.8 286.3 182.8	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 25 16 7/ 23 27.2 22.9 6.0 17.9	Shampoo .8 .8 .4 .1 17.2 1.8 0.0 4.5 7.3 taminated	Bench 17 8. 18.9 8.9 0.0 7.4 10.6	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench	Shampoo 0)0.0 15.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6	Shampoo .8 .8 .7 .1 17.2 1.8 0.0 4.5 7.3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0.(6370 4762 822! 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont	Shampoo 0)0.0 15.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontat	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon	Shampoo .8 .8 .4 .1 17.2 1.8 0.0 4.5 7.3 taminated Shampoo	Bench 17 8. n, 8.9 0.0 7.4 10.6 Deconta Bench	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench	Shampoo 0 00.0 15.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0	Bench 0. 8. 101 185 206.0 214.8 286.3 182.8 163.3 Decontai Bench	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench	Shampoo .8 .8 .4 .1 .17.2 .1.8 0.0 4.5 7.3 taminated Shampoo .3	Bench 17 8. n, 8.9 0.0 7.4 10.6 Deconta Bench	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 1.3
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 E5	Bench 0.(6370 4762 8229 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(Shampoo 0 00.0 55.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 75.0	Bench 0. 8. 101 185 206.0 214.8 286.3 182.8 183.3 Decontar Bench 0.	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 .8	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0	Bench 25 16 n/ 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14	Shampoo .8 .8 .4 .1 .17.2 .1.8 0.0 4.5 7.3 .2 .3 .2	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3.	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 1.3
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 E5 TP0 TP1	Bench 0.(6370 4762 8229 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197	Shampoo 0)0.0 15.0 1120.0 110.4 51.6 3.7 8.8 8.8 taminated Shampoo 0 75.0 75.0	Bench 0. 8. 101 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 10	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 .8 4.3	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 TP0 TP1	Bench 25 16 n/ 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3.	Shampoo 3.8 3.8 3.1 17.2 1.8 0.0 4.5 7.3 Taminated Shampoo 3.3 2 /a	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 1.3 .0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 E5 TP0 TP1 TP2 TP3	Bench 0.(6370 4762 822? 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197 3187 722	Shampoo 0 25.0 1120.0 110.4 51.6 3.7 8.8 8.8 taminated Shampoo 0 25.0 25.0 75.5	Bench 0. 8. 101 226.0 224.8 286.3 182.8 163.3 Decontai Bench 0. 10 194 246	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 .8 4.3 5.5	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 TP0 TP1 TP2 TP3	Bench 25 16 n/ 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4.	Shampoo 3.8 3.8 3.1 17.2 1.8 0.0 4.5 7.3 Taminated Shampoo 3.3 2 /a 4	Bench 17 8. 18.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3.	Shampc 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampc 4.3 .0 /a .4
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4	Bench 0.(6370 4762 822! 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197 3187 722: 9852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 55.0 7.5 1672.5	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 10 194 246 202.5	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 1.8 4.3 5.5 181.5	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 U5 U5 U5 TP0 TP1 TP2 TP3 TP4	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. ny 4.	Shampoo .8 .8 .7 .1 .17.2 .8 0.0 4.5 7.3 .3 taminated Shampoo .3 2 /a 4 11.8	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 1, 3. 11.1	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 4.4 9.8
TP0 TP1 TP2 TP3 TP4 TP5 TP5 TP6 TP7 TP8 E5 E5 TP0 TP1 TP2 TP3 TP4 TP5	Bench 0.(6370 4762 822! 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197 3187 722: 9852.5 6372.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 75.0 75.0 75.0 75.0 75.1 1672.5 215.8	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 1.8 4.3 5.5 181.5 50.6	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6	Shampoo .8 .8 .8 .1 17.2 1.8 0.0 4.5 7.3 .2 .3 .2 .4 11.8 0.0 1.3 .2 .4 .1 .3 .2 .4 .1 .3 .2 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 14 3. 11.1 0.0	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 1.3 .0 /a .4 11.0 0.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 E5 TP0 TP1 TP1 TP1 TP2 TP3 TP4 TP5 TP6	Bench 0.(6370 4762 822! 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197 3187 7221 9852.5 6372.5 7450.0	Shampoo 0 00.0 5.0 1120.0 110.4 51.6 3.7 8.8 25.0 75.0 75.0 75.0 75.0 1672.5 215.8 129.8	Bench 0. 8 100 185 206.0 214.8 286.3 182.8 163.3 Decontai Bench 0. 100 194 246 202.5 157.0 295.3	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0	Shampoo .8 .8 .4 .1 .17.2 .8 0.0 4.5 7.3 .3 .2 .3 .2 .4 .1.8 0.0 .3 .2 .4 .1.8 0.0 .3 .2 .4 .1.8 .1.0 .1.1 .1.	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3. 11.1 0.0 0.0	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 4.4 9.8 Shampo Shampo 3.3 .0 /a .4 11.0 0.0 0.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP5 TP6 TP7	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0 00.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7	Shampoo .8 .8 .8 .4 17.2 1.8 0.0 4.5 7.3 .2 .4 11.8 0.0 0.0 .3 .2 .4 11.8 0.0 0.0 3.9	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3. 11.1 0.0 0.0 4.1	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 3.3 .0 /a .4 11.0 0.0 0.0 3.9
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 55 55 55 55 55 55 57 50 57 50 57 50 57 57 57 57 57 57 57 57 57 57 57 57 57	Bench 0.(6370 4762 822! 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.(4197 3187 7221 9852.5 6372.5 7450.0	Shampoo 0 00.0 5.0 1120.0 110.4 51.6 3.7 8.8 25.0 75.0 75.0 75.0 75.0 1672.5 215.8 129.8	Bench 0. 8 100 185 206.0 214.8 286.3 182.8 163.3 Decontai Bench 0. 100 194 246 202.5 157.0 295.3	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0	Shampoo .8 .8 .4 .1 .17.2 .8 0.0 4.5 7.3 .3 .2 .3 .2 .4 .1.8 0.0 .3 .2 .4 .1.8 0.0 .3 .2 .4 .1.8 .1.0 .1.1 .1.	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3. 11.1 0.0 0.0	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 4.4 9.8 Shampo Shampo 3.3 .0 /a .4 11.0 0.0 0.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP5 TP6 TP7	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. ny 4. 11.7 0.6 0.0 4.7 7.7	Shampoo i.8 i.8 i.1 17.2 1.8 0.0 4.5 7.3 taminated Shampoo i.3 2 /a 4 11.8 0.0 0.0 3.9 7.3 taminated	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3. 11.1 0.0 0.0 4.1 7.4 Deconta	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 1.3 .0 /a .4 11.0 0.0 0.0 0.0 0.0 0.0 3.9 7.4 minated
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP5 TP6 TP7	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8	Bench 25 16 17 23 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 44 34 14 30 14 30 44 11.7 0.6 0.0 4.7 7.7	Shampoo .8 .8 .7 .1 17.2 1.8 0.0 4.5 7.3 .2 /a .4 11.8 0.0 3.9 7.3 .3 .2 /a .4 11.8 0.0 1.3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 4.4 9.8 .0 /a .3 .0 /a .4 .11.0 0.0 0.0 3.9 7.4 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U6 TP0 TP0	Bench 25 16 17 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. 14 3. 14 3. 14 3. 14 3. 14 3. 7 7 4. 11.7 0.6 0.0 4.7 7.7 7.7 19 10 10 10 10 10 10 10 10 10 10 10 10 10	Shampoo .8 .8 .7 .1 17.2 1.8 0.0 4.5 7.3 .2 .3 2 .3 2 .3 .4 11.8 0.0 0.0 3.9 7.3 .5 .5 .5 .5 .5 .5 .3 .2 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 200 4.1 7.4 5 Deconta Bench	Shampo 7.6 .0 /a .7 .7 .13.4 13.4 9.8 .0 4.4 9.8 Shampo 4.3 .0 /a .4 .11.0 0.0 0.0 3.9 7.4 minated Shampo 5.4
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 Heroin	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 11.7 0.6 0.0 4.7 7.7	Shampoo .8 .8 .7 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1	Bench 17 8 17 8 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4.	Shampo 7.6 .0 /a .7 .7 .13.4 10.0 0.0 4.4 9.8 .0 .0 /a .3 .0 .0 /a .4 11.0 0.0 0.0 3.9 7.4 .1 .0 .0 .0 5.4 .1
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP6 TP7 TP8	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 19 6. 0,0	Shampoo .8 .8 .8 .1 17.2 1.8 0.0 4.5 7.3 .3 .3 .2 .4 11.8 0.0 0.0 3.9 7.3 .1 .1 .1 .3 .2 .4 .1 .3 .2 .4 .4 .1 .3 .2 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4. n,	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 0.4 4 9.8 minated Shampo 7.4 11.0 0.0 0.0 3.9 7.4 minated Shampo 5.4 .1 /a
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 Heroin	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 11.7 0.6 0.0 4.7 7.7	Shampoo .8 .8 .8 .1 17.2 1.8 0.0 4.5 7.3 .3 .3 .2 .4 11.8 0.0 0.0 3.9 7.3 .1 .1 .1 .3 .2 .4 .1 .3 .2 .4 .4 .1 .3 .2 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8 17 8 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4.	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 0.4 4 9.8 minated Shampo 7.4 11.0 0.0 0.0 3.9 7.4 minated Shampo 5.4 .1 /a
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8 Heroin	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 19 6. 0,0	Shampoo .8 .8 .8 .1 17.2 1.8 0.0 4.5 7.3 .3 .3 .2 .4 11.8 0.0 0.0 3.9 7.3 .1 .1 .1 .3 .2 .4 .1 .3 .2 .4 .4 .1 .3 .2 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4. n,	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 0.4 4 9.8 minated Shampo 7.4 11.0 0.0 0.0 3.9 7.4 minated Shampo 5.4 .1 /a
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 Heroin	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 9927.5 9530.0 9927.5 9530.0 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 7.5 1672.5 215.8 129.8 0.6	Bench 0. 8. 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 27.2 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7	Shampoo i.8 i.8 i.7 17.2 1.8 0.0 4.5 7.3 taminated Shampoo i.3 2 /a 4 11.8 0.0 0.0 3.9 7.3 taminated Shampoo 1.3 2 /a 4 4 1.8 0.0 0.0 3.9 7.3 taminated Shampoo 1.3 2 /a 4 4 8 0.0 0.0 1.9 /a 8 1.8 0.0 1.9 1.8 1.1 1.8 1.1 1.8 1.1 1.8 1.1 1.8 1.1 1.8 1.8	Bench 17 8. 9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4. 7.4	Shampo 7.6 .0 /a .7 .7 .13.4 1.0 0.0 0.4 .4 9.8 minated Shampo 7.4 11.0 0.0 0.0 3.9 7.4 11.0 0.0 0.0 3.9 7.4 5hampo 5.4 .1 /a .7
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8 Heroin pg/mg hair	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5 4745.0	Shampoo 0)0.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 75.0 75.5 1672.5 215.8 129.8 0.6 6.9	Bench 0. 8 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0 170.8	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2 7.5	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. n/ 4. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 9 6.0 17.9 22.6	Shampoo .8 .8 .8 .4 17.2 1.8 0.0 4.5 7.3 taminated Shampoo .3 .2 /a 4 11.8 0.0 0.0 3.9 7.3 taminated Shampoo .3 .2 /a 4 1.8 0.0 4.5 7.3 taminated Shampoo .3 .2 /a .4 .1 .4 .5 .3 .2 .4 .1 .3 .2 .4 .3 .3 .2 .4 .3 .3 .2 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4. 17 3. 11.3	Shampo 7.6 .0 /a .7 .7 .7 .7 .7 .7 .0 .4 .3 .0 .0 .4 .3 .0 .7 .4 .1 .0 .0 .0 .0 .3.9 .7.4 .1 .5 .4 .1 .1 .5 .4
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 E5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8 Heroin	Bench 0.0 6370 4762 8225 21625.0 10407.5 10850.0 9927.5 9530.0 Not Decont Bench 0.0 4197 3187 7222 9852.5 6372.5 7450.0 8852.5 4745.0	Shampoo 0 00.0 5.0 1120.0 110.4 51.6 3.7 8.8 taminated Shampoo 0 75.0 75.0 75.0 75.0 75.0 1672.5 215.8 129.8 0.6 6.9	Bench 0. 8 100 185 206.0 214.8 286.3 182.8 163.3 Decontar Bench 0. 100 194 246 202.5 157.0 295.3 234.0 170.8	Shampoo 0 2 1.7 5.8 86.5 45.9 28.7 1.0 8.8 minated Shampoo 0 8.8 4.3 5.5 181.5 50.6 37.3 0.2 7.5	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 25 16 17 22.9 6.0 17.9 22.6 Not Decon Bench 14 3. 11.7 0.6 0.0 4.7 7.7 Not Decon Bench 9 6. 0.0 4.7 7.7 11.7 0.6 0.0 4.7 7.7 4. 11.7 0.6 0.0 4.7 7.7	Shampoo .8 .8 .4 17.2 1.8 0.0 4.5 7.3 taminated Shampoo .3 .2 /a 4 11.8 0.0 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.0 3.9 7.3 taminated Shampoo 0.1 9 .2 .3 .3 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1	Bench 17 8. 18.9 8.9 0.0 7.4 10.6 Deconta Bench 14 3. n/ 3. 11.1 0.0 0.0 4.1 7.4 Deconta Bench 15 4. 15 4. 17 8. 11.3 0.0	Shampo 7.6 .0 /a .7 13.4 1.0 0.0 4.4 9.8 minated Shampo 7.4 11.0 0.0 0.0 3.9 7.4 minated Shampo 5.4 .1 /a .7 .7 .7 .7

E1	Not Decont		Deconta		U1			taminated	Deconta	
	Bench	Shampoo	Bench	Shampoo	_		Bench	Shampoo	Bench	Shampoo
TP0	0.0		0.		TP		0		0.	
TP1	1052		0.		TP		0		0.	
TP2	731		41		TP		n,		n/	
TP3	919		28		TP		0		0.	
TP4	1076.5	556.5	50.1	53.7	TP	4	0.0	0.0	0.1	0.1
TP5	1532.5	261.8	49.9	53.5	TP	5	0.0	0.0	0.0	0.0
TP6	1330.0	198.8	74.4	76.5	TP	6	0.3	0.3	0.3	1.3
TP7	979.8	135.8	62.7	44.3	TP	7	0.2	0.1	0.1	0.1
TP8	1052.0	33.7	28.2	26.7	TP	8	0.9	0.4	0.4	0.4
E2	Not Decont	taminated	Deconta	minated	U2	N	ot Decon	taminated	Deconta	
	Bench	Shampoo	Bench	Shampoo			Bench	Shampoo	Bench	Shampoo
TP0	0.0		0.		TP			3.3	16	
TP1	1857		5.		TP			5.3	27	
TP2	1046		348		TP		n,		n/	
TP3	315	2.5	201	1.8	TP	3	15	7.8	8.	2
TP4	4665.0	2345.0	465.0	502.5	TP	4	55.8	23.9	10.8	15.4
TP5	5445.0	1450.0	213.3	322.8	TP	5 :	104.4	27.8	13.0	11.8
TP6	4215.0	1270.0	528.0	450.8	TP	6 :	106.6	24.5	19.3	13.0
TP7	3645.0	443.8	426.5	216.8	TP	7	69.3	17.8	19.7	10.4
TP8	3817.5	259.8	474.0	201.0	TP	8 :	119.0	7.3	7.5	4.2
E3	Not Decont	taminated	Deconta	minated	U3	N	ot Decon	taminated	Deconta	minated
	Bench	Shampoo	Bench	Shampoo			Bench	Shampoo	Bench	Shampoo
TP0	0.0		0.		TP		416	•	378	
TP1	786		0.		TP		390		194	
TP2	474		189		TP		n,		n/	
TP3	227		214		TP		503		184	
TP4	2232.5	1016.3	232.5	266.0	TP		303 8047.5	1557.5	3375.0	1665.0
TP4 TP5	3122.5	817.0	232.5	200.0	TP		107.5	2265.0	3375.0 1705.0	1005.0
TP6	3642.5	712.8	484.8	381.3	TP		200.0	2517.5	2067.5	1305.0
TP7 TP8	3362.5 2140.0	377.0 207.3	241.5 226.5	166.5 138.8	TP TP		667.5 435.0	1847.5 1605.0	2365.0 1737.5	1367.5 567.3
			220.5	150.0		5		1005.0	1/3/.5	507.5
E4	Not Decont		Deconta		U4			taminated	Deconta	
	Bench	Shampoo	Bench	Shampoo			Bench	Shampoo	Bench	Shampoo
TP0	0.0		0.		TP			3.4	70	
TP1	491	0.0	0.	-	TP		10		72	
TP2	4943	2.5	64		TP		n,		n/	
TP3	171	5.0	135	5.0	TP	3	12	2.5	64	.3
TP4	5050.0	785.5	206.0	148.8	TP	4 :	107.6	71.2	109.1	52.1
TP5	3690.0	510.0	227.8	137.0	TP	5 2	215.5	83.5	108.0	55.4
TP6	2815.0	368.3	355.3	186.8	TP	6 :	107.6	78.0	65.1	60.5
TP7	2975.0	159.3	140.8	72.8	TP	7 :	125.5	35.1	61.5	22.5
TP8	2480.0	66.7	161.5	49.8	TP	8 :	117.0	15.0	35.5	9.5
			Deconta	minated	U5	N	ot Decon	taminated	Deconta	minated
E5	Not Decont	taminated					Bench	Shampoo	Bench	Shampoo
E5	Not Decont Bench	taminated Shampoo	Bench	Shampoo		E	Jenen	•		.6
E5 TP0	Bench	Shampoo			ТР			.7	57	
TP0	Bench 0.0	Shampoo 0	Bench 0.	0		0	32			.2
TP0 TP1	Bench 0.(312	Shampoo 0 7.5	Bench 0. 1.	0 4	TP	0 1	32 27	.1	25	
TPO TP1 TP2	Bench 0.0 312 298	Shampoo 0 7.5 5.0	Bench 0. 1. 60	0 4 .6	TP TP	0 1 2	32 27 n,	7.1 /a	25 n/	/a
TPO TP1 TP2 TP3	Bench 0.1 312 298 923	Shampoo 0 7.5 5.0 3.8	Bench 0. 1. 60 92	0 4 .6 .2	TP TP TP	0 1 2 3	32 27 n, 31	'.1 /a 8	25 n/ 13	/a .5
TPO TP1 TP2 TP3 TP4	Bench 0. 312 298 923 1108.8	Shampoo 0 7.5 5.0 3.8 490.0	Bench 0. 1. 60 92 88.3	0 4 .6 .2 133.0	TP TP TP TP	0 1 2 3 4	32 27 n, 31 27.0	7.1 /a 8 17.8	25 n/ 13 19.9	/a .5 16.3
TP0 TP1 TP2 TP3 TP4 TP5	Bench 0. 312 298: 923 1108.8 1165.0	Shampoo 0 7.5 5.0 3.8 490.0 301.5	Bench 0. 1. 60 92 88.3 65.6	0 4 .6 .2 133.0 90.7	ТР ТР ТР ТР ТР	0 1 2 3 4 5	32 27 n, 31 27.0 51.9	7.1 /a 8 17.8 23.7	25 n/ 13 19.9 17.2	/a 16.3 11.0
TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 0.(312 298 923 1108.8 1165.0 1222.5	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5	Bench 0. 1. 60 92 88.3 65.6 172.0	0 4 .6 .2 133.0 90.7 141.0	TP TP TP TP TP TP	0 1 2 3 4 5 6	32 27 n, 31 27.0 51.9 38.0	7.1 /a 8 17.8 23.7 18.2	25 n/ 13 19.9 17.2 18.9	/a 16.3 11.0 13.6
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 0.(312' 298: 923 1108.8 1165.0 1222.5 1230.0	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP	0 1 2 3 4 5 6 7	32 27 n, 31 27.0 51.9 38.0 31.8	7.1 /a 8 17.8 23.7 18.2 14.2	25 n/ 13 19.9 17.2 18.9 20.8	/a 5.5 16.3 11.0 13.6 9.8
TP0 TP1 TP2 TP3 TP4 TP5 TP6	Bench 0.(312 298 923 1108.8 1165.0 1222.5	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5	Bench 0. 1. 60 92 88.3 65.6 172.0	0 4 .6 .2 133.0 90.7 141.0	TP TP TP TP TP TP	0 1 2 3 4 5 6 7	32 27 n, 31 27.0 51.9 38.0	7.1 /a 8 17.8 23.7 18.2	25 n/ 13 19.9 17.2 18.9	/a 16.3 11.0 13.6
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 0.(312' 298: 923 1108.8 1165.0 1222.5 1230.0	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP	0 1 2 3 4 5 6 6 7 8 8 N	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 tot Decon	1.1 /a 8 17.8 23.7 18.2 14.2 6.9 taminated	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta	/a 5 16.3 11.0 13.6 9.8 4.9 minated
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 0.(312' 298: 923 1108.8 1165.0 1222.5 1230.0	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 6 6 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 18.7 ot Decon 3ench	2.1 /a 8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo	25 n/ 13 19.9 17.2 18.9 20.8 8.4 20.8 8.4 Deconta Bench	/a 5 16.3 11.0 13.6 9.8 4.9 minated Shampo
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0.(312' 298: 923 1108.8 1165.0 1222.5 1230.0	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 7 8 8 8 8 8 8 8 7 7 8 8 7 7 8 8 8 7 7 8 8 7 7 8 8 8 7	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 iot Decon Bench 300	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 285	/a 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM	Bench 0.(312' 298' 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 8 8 8 8 8 8 8 7 8 8 7 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 iot Decon 3ench 300 32	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8	25 n/ 13 19.9 17.2 18.9 20.8 8.4 20.8 8.4 Deconta Bench 283 226	/a 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 6.5
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0.(312' 298' 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 8 8 8 8 8 8 8 7 8 8 7 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 iot Decon Bench 300	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 285	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampc 3.5 5.5
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM	Bench 0.(312' 298' 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 8 8 7 8 8 8 8 7 8 8 7 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 0 t Decon 3ench 300 32: n,	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8	25 n/ 13 19.9 17.2 18.9 20.8 8.4 20.8 8.4 Deconta Bench 283 226	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 /a
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM	Bench 0.(312' 298' 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 5 6 6 7 8 8 8 8 8 8 7 8 8 8 8 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 0 t Decon 3ench 300 32: n,	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8 /a	25 n/ 13 19.9 17.2 18.9 20.8 8.4 20.8 8.4 Deconta Bench 283 220 n/	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 /a
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM	Bench 0.(312' 298' 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4	0 4 .6 .2 133.0 90.7 141.0 58.4	TP TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 8 8 N 8 9 1 2 2 3 4	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 0 t Decon 3ench 300 32: n, 12:	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 Taminated Shampoo 0.3 5.8 /a 5.0	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 283 226 n/ 81	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 6.5 /a .6
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM pg/mg hair	Bench 0. 312 298 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9 69.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4 73.3	0 4 .6 133.0 90.7 141.0 58.4 37.7	TP TP TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 5 6 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	32 27 n, 31 27.0 51.9 38.0 31.8 18.7 ot Decon 3ench 300 322 n, 12 91.4	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 Taminated Shampoo 0.3 5.8 /a 5.0 157.3	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 283 226 n/ 81 87.9	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 /a .6 166.5
TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM pg/mg hair	Bench 0. 312 298 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9 69.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4 73.3	0 4 .6 133.0 90.7 141.0 58.4 37.7	TP TP TP TP TP TP TP TP TP TP TP TP TP T	0 1 2 3 4 5 6 7 8	32 77.0 51.9 38.0 31.8 18.7 ot Decon 3ench 300 322 n, 12: 91.4 157.5 147.0	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8 /a 5.0 157.3 198.3 203.0	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 28 226 n/ 81 87.9 74.1 104.9	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 /a .6 166.5 119.8 144.3
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 6-AM	Bench 0. 312 298 923 1108.8 1165.0 1222.5 1230.0 826.8	Shampoo 0 7.5 5.0 3.8 490.0 301.5 269.5 130.9 69.9	Bench 0. 1. 60 92 88.3 65.6 172.0 80.4 73.3	0 4 .6 133.0 90.7 141.0 58.4 37.7	TP TP TP TP TP TP TP TP TP TP TP TP TP	0 1 2 3 4 5 6 7 8 0 1 2 3 4 5 6 7 8 7 8 7 8 7 7 7 7 7 7 7 7 7 7 7 7 7	32 27, 0, 31, 27, 0 51, 9 38, 0 31, 8 18, 7 10, 10, 20, 0 30, 32, 12, 91, 4 157, 5	2.1 /a .8 17.8 23.7 18.2 14.2 6.9 taminated Shampoo 0.3 5.8 /a 5.0 157.3 198.3	25 n/ 13 19.9 17.2 18.9 20.8 8.4 Deconta Bench 28 226 n/ 81 87.9 74.1	/a .5 16.3 11.0 13.6 9.8 4.9 minated Shampo 3.5 5.5 /a .6 166.5 119.8

E1		Not Decon	taminated	Deconta	aminated	U1	Not Decon	taminated	Deconta	minated
		Bench	Shampoo	Bench	Shampoo	01	Bench	Shampoo	Bench	Shampoo
	TP0	0.	•		0.0	TP0		.2		.0
	TP1	113	6.0		0.0	TP1		.9		.9
	TP2	141		5	.0	TP2	n,	/a	n	/a
	TP3	153	1.5	5	.5	TP3	1	.0	1	.2
	TP4	335.8	178.0	17.0	22.3	TP4	0.0	0.0	0.0	0.0
	TP5	235.0	47.7	23.6	22.3	TP5	0.7	0.6	0.5	0.6
	TP6	213.8	50.3	15.2	25.2	TP6	1.2	1.2	1.2	1.5
	TP7	224.0	44.1	26.6	26.5	TP7	0.2	0.2	0.2	0.2
	TP8	383.0	25.0	9.8	21.4	TP8	2.6	2.3	2.2	2.3
E2		Not Decon	taminated	Decente	aminated	U2	Not Docon	taminated	Decente	minated
		Bench	Shampoo	Bench	Shampoo	02	Bench	Shampoo	Bench	Shampoo
	TP0	0.			0.0	ТРО		.5		4.6
	TP1	205			7	TP1		3.0		9.8
	TP2	193			1.1	TP2		V/0!		/a
	TP3	470			1.8	TP3		1.5		3.0
	TP4	1795.0	828.0	137.5	187.5	TP4	97.1	55.3	39.5	37.4
	TP5	931.3	261.0	94.2	165.3	TP5	102.4	55.4	42.6	37.6
	TP6	682.5	268.8	95.5	121.0	TP6	105.3	51.8	41.5	32.4
	TP7	869.5	149.5	175.8	131.3	TP7	76.1	36.0	32.9	23.5
	TP8	1477.5	175.5	158.0	121.5	TP8	140.0	22.2	27.6	18.2
E3		Not Decon	taminated	Decent	aminated	U3	Not Door	taminated	Docost	minated
[^{E3}		Bench	shampoo	Deconta Bench	Shampoo	05	Not Decon Bench	Shampoo	Deconta Bench	aminated Shampoo
	ТРО	Bench 0.			5nampoo 1.0	TPO		5.0		2.0
	TP1	640			0.0	TP1		.0.0		6.8
	TP2	942			8.5	TP2		v/0!		/a
	TP3	30:			0.2	TP3		52.5		50.0
	TP4	808.8	357.3	71.2	97.8	TP4	2595.0	1370.0	1317.5	1039.3
	TP5	452.5	150.8	102.8	111.5	TP5	2120.0	1402.5	1255.0	1107.5
	TP6	711.8	204.8	73.2	89.3	TP6	2385.0	1615.0	1272.5	1012.5
	TP7	779.5	134.8	100.6	114.2	TP7	2135.0	1055.0	1127.5	672.8
	TP8	843.3	127.8	96.9	83.9	TP8	2517.5	1365.0	1377.5	783.5
54		Net Deere	4	Deserts	un in et e d					un in stand
E4		Not Decon Bench			aminated	U4	Not Decon	taminated	Deconta	aminated
E4	TPO	Bench	Shampoo	Bench	Shampoo		Not Decon Bench	taminated Shampoo	Deconta Bench	Shampoo
E4	TPO TP1	Bench 0.	Shampoo 0	Bench 0	Shampoo 1.0	ТРО	Not Decon Bench 15	taminated Shampoo 9.0	Deconta Bench 68	Shampoo 3.1
E4	TP1	Bench 0. 375	Shampoo 0 5.8	Bench 0 0	Shampoo 1.0 1.0	TP0 TP1	Not Decon Bench 15 18	taminated Shampoo 9.0 7.3	Deconta Bench 68 14	Shampoo 3.1 3.5
E4	TP1 TP2	Bench 0. 375 913	Shampoo 0 5.8 3.5	Bench 0 0 6	Shampoo 1.0 1.0 1.3	TPO TP1 TP2	Not Decon Bench 15 18 #DI	taminated Shampoo 9.0 7.3 V/0!	Deconta Bench 68 14 n	Shampoo 3.1 3.5 /a
E4	TP1	Bench 0. 375	Shampoo 0 5.8 3.5	Bench 0 0 6	Shampoo 1.0 1.0	TP0 TP1	Not Decon Bench 15 18 #DI	taminated Shampoo 9.0 7.3 V/0! 6.8	Deconta Bench 68 14 n	Shampoo 3.1 3.5
E4	TP1 TP2 TP3	Bench 0. 375 913 292	Shampoo 0 5.8 3.5 2.8	Bench 0 0 6 27	Shampoo 0.0 0.0 0.3 7.7	TP0 TP1 TP2 TP3	Not Decon Bench 15 18 #DI 21	taminated Shampoo 9.0 7.3 V/0!	Deconta Bench 68 14 n 15	Shampoo 3.1 3.5 /a 7.3
E4	TP1 TP2 TP3 TP4	Bench 0. 375 913 292 1995.0	Shampoo 0 5.8 3.5 2.8 232.0	Bench 0 6 27 84.9	Shampoo 0.0 1.3 7.7 55.4	TP0 TP1 TP2 TP3 TP4	Not Decon Bench 15 18 #DI 21 248.5	taminated Shampoo 9.0 7.3 v/0! 6.8 172.5	Deconta Bench 68 14 n 15 174.3	Shampoo 3.1 3.5 /a 7.3 140.8
E4	TP1 TP2 TP3 TP4 TP5	Bench 0. 375 913 292 1995.0 675.0	Shampoo 0 5.8 3.5 2.8 232.0 107.5	Bench 0 6 27 84.9 99.6	Shampoo 1.0 1.3 7.7 55.4 77.4	TP0 TP1 TP2 TP3 TP4 TP5	Not Decon Bench 15 18 #DI 21 248.5 268.3	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3	Deconta Bench 68 14 n 15 174.3 215.8	Shampoo 3.1 3.5 /a 7.3 140.8 150.3
E4	TP1 TP2 TP3 TP4 TP5 TP6	Bench 0. 375 913 292 1995.0 675.0 737.5	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0	Bench 0 0 6 27 84.9 99.6 86.9	Shampoo 0.0 0.0 0.3 7.7 55.4 77.4 68.9	TP0 TP1 TP2 TP3 TP4 TP5 TP6	Not Decon Bench 15 18 #DI 21 248.5 268.3 256.3	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3	Deconta Bench 68 14 n 15 174.3 215.8 179.8	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7
	TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4	Bench 0 0 2: 84.9 99.6 86.9 72.9 66.0	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15' 18 #DI 248.5 268.3 256.3 221.0 211.0	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7	Deconta Bench 14 15 174.3 215.8 179.8 149.3 140.8	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2
E4	TP1 TP2 TP3 TP4 TP5 TP6 TP7	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated	Bench 0 0 6 2: 84.9 99.6 86.9 72.9 66.0 Deconta	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7	Not Decon Bench 15' 18 #DI 248.5 268.3 256.3 221.0 211.0 Not Decon	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 Deconta	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated
	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo	Bench 0 0 6 2: 84.9 99.6 86.9 72.9 66.0 Deconta Bench	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15' 18 #DI 248.5 268.3 256.3 221.0 211.0 Not Decon Bench	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 Deconta Bench	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo
	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0.	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0	Bench 0 0 6 2: 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0	Not Decon Bench 15' 18 #DI 248.5 268.3 256.3 221.0 211.0 211.0 Not Decon Bench 93	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 Deconta Bench 93	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1
	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 283	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8	Bench 0 0 6 2: 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 0 0	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15' 18 #DI 248.5 268.3 256.3 221.0 211.0 211.0 Not Decon Bench 93 93	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 8.3	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 Deconta Bench 93 75	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0
	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP0 TP1 TP2	Bench 0. 379 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 283 608	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8 3.3	Bench 0 0 6 2: 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 0 0 6 6	Shampoo 0.0 3.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0 0.0 5.9	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0 TP1 TP2	Not Decon Bench 15: 18 #DIY 21: 248.5 268.3 256.3 221.0 211.0 Not Decon Bench 93 93 #DIY	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 3.3 V/0!	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 Deconta Bench 93 75 75 75 75 75 75 75 75 75 75 75 75 75	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0 /a
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	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 TP7 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 Morphine	Bench 0. 375 911 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 288 600 97 393.5 178.3 261.8 260.5	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8 3.3 .7 137.0 58.1 78.3 62.0	Bench 0 0 6 27 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 0 0 6 15 30.4 27.1 34.5 41.5	Shampoo 0.0 0.0 0.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0 0.0 5.2 47.8 48.5 43.6 47.0	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP3 TP4 TP5 TP6 TP7 TP8 U6 U6 TP1 TP2 TP3 TP4	Not Decon Bench 15' 18 #DI' 248.5 268.3 256.3 221.0 211.0 211.0 Not Decon Bench 93 93 #DI' 11 110.5 139.8 126.8 108.0 86.8 200 86.8 108.0 86.8	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 3.3 V/0! 6.8 74.3 90.9 82.0 56.9 41.5 taminated Shampoo 9.8 8.0 V/0! 8.5 169.8	Deconta Bench 14 15 174.3 215.8 179.8 149.3 140.8 Deconta Bench 93.7 88.6 73.6 57.0 Deconta Bench 12 13 n 94 75.5	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0 /a 4.3 64.2 66.2 63.1 38.9 40.8 aminated Shampoo 4.0 8.8 /a 4.4 111.3
E5	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 TP7 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8 Morphine pg/mg hair	Bench 0. 375 911 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 283 600 97 393.5 178.3 261.8 260.5 376.3	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8 3.3 .7 137.0 58.1 78.3 62.0 67.4	Bench 0 0 2 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 6 1 30.4 27.1 34.5 41.5 30.9	Shampoo 0.0 1.0 1.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0 5.2 47.8 48.5 43.6 47.0 32.4	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U6 U6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15: 18 #DIV 21: 248.5 268.3 256.3 221.0 211.0 Not Decon Bench 93 #DIV 11: 110.5 139.8 126.8 108.0 86.8 Not Decon Bench 19: 19: 40: 19: 19: 19: 19: 19: 19: 19: 19: 19: 19	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 3.3 V/0! 6.8 74.3 90.9 82.0 56.9 41.5 taminated Shampoo 9.8 8.0 V/0! 8.5 169.8 155.8	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 149.3 140.8 Deconta Bench 93 73 80.4 93.7 88.6 73.6 57.0 Deconta Bench 12 13 n 94 75.5 97.5	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0 /a 4.3 64.2 66.2 63.1 38.9 40.8 aminated Shampoo 4.0 8.8 /a 4.4 111.3 137.3
E5	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 TP7 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 Morphine	Bench 0. 375 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 283 600 97 393.5 178.3 261.8 260.5 376.3	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8 3.3 .7 137.0 58.1 78.3 62.0 67.4	Bench 0 0 2 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 6 1 30.4 27.1 34.5 41.5 30.9	Shampoo 0.0 1.0 1.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0 5.2 47.8 48.5 43.6 47.0 32.4	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U6 U6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15: 18 #DI' 21: 248.5 268.3 256.3 221.0 211.0 Not Decon Bench 93 93 #DI' 11: 110.5 139.8 126.8 108.0 86.8 Not Decon Bench 19: 19: 19: 19: 19: 19: 19: 19: 19: 19:	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 3.3 V/0! 6.8 74.3 90.9 82.0 56.9 41.5 taminated Shampoo 9.8 8.0 V/0! 8.5 169.8 155.8 155.8 153.3	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 149.3 140.8 Deconta Bench 93.7 88.6 73.6 57.0 Deconta Bench 12 13 n 94 75.5 97.5 107.5	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0 /a 4.3 64.2 66.2 63.1 38.9 40.8 aminated Shampoo 4.0 8.8 /a 4.4 111.3 137.3 116.3
E5	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP7 TP8 TP7 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP5 TP6 TP7 TP8 Morphine pg/mg hair	Bench 0. 375 913 292 1995.0 675.0 737.5 740.3 1127.3 Not Decon Bench 0. 283 600 97 393.5 178.3 261.8 260.5 376.3	Shampoo 0 5.8 3.5 2.8 232.0 107.5 125.0 86.7 64.4 taminated Shampoo 0 1.8 3.3 .7 137.0 58.1 78.3 62.0 67.4	Bench 0 0 2 84.9 99.6 86.9 72.9 66.0 Deconta Bench 0 6 1 30.4 27.1 34.5 41.5 30.9	Shampoo 0.0 1.0 1.3 7.7 55.4 77.4 68.9 60.6 40.7 aminated Shampoo 0.0 5.2 47.8 48.5 43.6 47.0 32.4	TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U5 TP0 TP1 TP2 TP3 TP4 TP5 TP0 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 U6 U6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	Not Decon Bench 15: 18 #DIV 21: 248.5 268.3 256.3 221.0 211.0 Not Decon Bench 93 #DIV 11: 110.5 139.8 126.8 108.0 86.8 Not Decon Bench 19: 19: 40: 19: 19: 19: 19: 19: 19: 19: 19: 19: 19	taminated Shampoo 9.0 7.3 V/0! 6.8 172.5 188.3 195.3 96.1 49.7 taminated Shampoo 8.5 3.3 V/0! 6.8 74.3 90.9 82.0 56.9 41.5 taminated Shampoo 9.8 8.0 V/0! 8.5 169.8 155.8	Deconta Bench 68 14 n 15 174.3 215.8 179.8 149.3 140.8 149.3 140.8 Deconta Bench 93 73 80.4 93.7 88.6 73.6 57.0 Deconta Bench 12 13 n 94 75.5 97.5	Shampoo 3.1 3.5 /a 7.3 140.8 150.3 142.7 68.8 37.2 aminated Shampoo 3.1 3.0 /a 4.3 64.2 66.2 63.1 38.9 40.8 aminated Shampoo 4.0 8.8 /a 4.4 111.3 137.3