Attention: **Mr Andreas Roussos (**Managing Director)

The Company: **NCIS – Narcotics Criminal Investigative Services (PTY) Ltd**

The Product: **Narcotics Detector Multifunctional Universal Kit – PROTOCOL**

Sensitivity Evaluation of Narcotics Detector Multifunctional Universal Kit

Detection System with Universal Buffer and Narcotics Detector

Procedure / Methods

Six standard drug standards were purchased from Cerilliant company and were selected for the Narcotics Detector Multifunctional Universal Kit **validation test**, namely cocaine, methamphetamine, PCP, THC, OPI, and amphetamine. All drugs were equal in concentration i.e. 1.00 ± 0.006 mg/ml each.

For the Narcotics Detector Multifunctional Universal Kit test project to be undertaken, all standard samples had to be diluted with both the Altis Bologics – buffer and the Narcotics Detector - Universal Buffer to test for their effectiveness. Two sterile vials (A and B) were labelled with the names of the drugs to be used with the buffer. 1ml of buffer was pipetted into both sterile vials.

100 ng of each standard drugs namely COC, MET, PCP were mixed together to check for interference and cross-reactivity issues, and pipetted in a single sterile vial and then diluted with 1ml of buffer. The same was also done for the other drugs (THC, OPI, and AMP). The test was also repeated for the universal buffer (1 ml).

Both vials were shaken to mix the contents for 2 minutes, and a Pasteur pipette was used to transfer 3 drops of the contents of vial "A" on the left hand side of the test device plate, and another 3 drops of the contents of vial "B" on the right hand side of the test device plate.

Results were observed after 10 minutes.

Interpretation of results

Negative: A coloured line in the control line region (C) and a coloured line in the test line region (T) for a specific drug indicate a negative result (this indicates that the drug concentration in the sample specimen is below the designated cut-off level for that specific drug).

Positive: A coloured line in the control region (C) but no line in the test line region (T) for a specific drug indicates a positive result (this indicates that the drug concentration in the sample specimen exceeds the designated cut-off for that specific drug).

Invalid: Control line (C) fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons to control line failure. If after repetition, you obtain an invalid result again, it is possible that the sample to be investigated contains substances which interfere with the test (A very, very faint line, one that requires you to look twice to see such a line must be regarded as a positive result).

Abbreviations used

COC - Cocaine

Met - Methamphetamine

Amp - Amphetamine

OPI - Opiate (Morphine and Heroine)

THC - Tetrahydrocannabinol

PCP - Phencyclidine

Results

Table 1. Drugs applied to the test when used with Drug Detective™ Buffer.

Drugs applied to the test	Drug standard concentration	Amount of drug transferred into the vial	Amount of mixture transferred on the test plate	Buffer used	Outcomes / Results
COC	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	Positive
MET	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	Positive
PCP	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	Positive
THC	1.00 µg/µl	50 µg	5000 ng	Universal NCIS buffer	Positive
OPI	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	Positive
AMP	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	Positive

Discussion: Table 1

All drugs tested positive when 100 ng of all drugs and Universal NCIS buffer™ buffer except for THC which gave positive results at 5000 ng.

Cannabis tested positive at 0.25 g/ml of plant material. THC tested positive at 5000 ng doses. All other drugs tested positive when 100 ng of drug in Universal NCIS buffer was applied to the wells.

Table 2. Drugs mixed together (Cross reactivity) applied on one kit with Drug Detective™ universal buffer

Drugs applied to the test	Drug standard concentration	Amount of stock transferred into the vial	Amount of mixture transferred on the test plate	Buffer used	Outcome/ Results
COC, MET, PCP, OPI, AMP, &	1.00 µg/µl	1 µg	100 ng	Universal NCIS buffer	All positive
THC		50 µg	5000 ng	Universal NCIS buffer	Positive

Discussion: Table 2.

The tests were also performed with all drugs mixed together on one kit, and the kit identified all drugs on the one and same testing panel. All drugs tested positive when 100 ng of drug in Universal NCIS buffer were applied to the kit. This shows that the kit can detect and identify one or many different drugs mixed together. Cross contamination of the drugs applied on the kit does not have an effect on the drug detective kit.

Conclusion

The NCIS test kit for surfaces gave reliable (+) results at trace amounts of 100 ng, for all drugs tested with Universal NCIS buffer except THC which required a higher dose of 5000 ng. Cannabis extract gave reliable positive results consistently when used at as per kit instructions.

The test procedure is simple and quick to perform.

Under these test conditions, the NCIS advanced drug kit detection system for surfaces were compound specific and performed well as a quick screening device for trace amounts of the specified drugs.

All results were satisfactory (NCIS **kit functioned and performed** with total accuracy and reliability).

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