A28 The Development of a Universal Non-Target Calibration Compound(s) for the Daily Reinforcement and Determination of Detection Limits for Detection Canines

Katylynn Beltz, BS, Florida International University, 11200 Southwest 8th Street, RM CP345, Miami, FL 33199; and Kenneth G. Furton, PhD, International Forensic Research Institute, Florida International University, University Park, Miami, FL 33199*

After attending this presentation, attendees will understand the goal of this study, developing a calibration compound for which the reliability of the biological and instrumental detectors can be studied. Attendees will also learn the criteria used for calibration compound selection and the results obtained from the laboratory and field studies.

This presentation will impact the forensic science community by increasing the value of the detection canine's responses. By defining the working parameters of the detection canine, the responses to specific odors will withstand greater scrutiny from the legal system as the handler will be able to provide documentation that the detection canine was working within acceptable limits when the tests were completed, thus making the detection canine as objective and reliable as a laboratory instrument.

Detection canines are widely used in many forensic fields and have been proven to be valuable assets while investigating a case. The use of detection canines as biological detectors is one of the most widely accepted methods for reliable odor detection due to the ability of the canine to quickly and reliably locate the source of an odor to which they

are trained. The goal of this study is to develop a calibration compound for which the reliability of the biological and instrumental detectors can be studied. Currently there are no set practices to ensure that a biological detector is working at a reliable and suitable standard on a daily basis. As instruments in a laboratory are calibrated to ensure they are in proper working order, developing a universal compound for which biological detectors can be calibrated would be useful. By training the canine to alert to a calibration compound before each working day, the handler can record if the biological detector is working to suitable standards. This compound has the potential to also be used in selecting future biological detectors by determining the time it takes to train the canine to alert to the compound and the sensitivity of detection the canine can achieve.

Compound selection was based on three criteria: safety, scarcity in the natural environment, and a non-dominant odor compound used by detection canines. Since the calibration compound will be used daily, it must pose no danger to both the handler and canine, therefore limiting the compounds to those having no health hazards. The compound must be rarely seen in the environment to ensure that when the canine alerts, it is not alerting to a commonly seen environmental odor. The odor must be unique for all detectors to ensure there is no cross detection. For example, if the compound is a dominant odor of an explosive compound, training a drug canine to alert to the calibration compound will pose a problem because if the canine alerts in the field, it may be alerting to an explosive containing the dominant odor of the calibration compound rather than a drug odor. Several compounds meeting these criteria have been tested and the best potential calibration compounds are compared in this study. These calibration compounds are rarely seen in the environment, safe for daily use, and have not been found to be an odorant for any of the detection canines tested to date. Examples of odorants identified as dominant odor compounds used by detector canines include piperonal for 3,4-methylenedioxymethamphetamine (MDMA) and 2-ethyl-1-hexanol for plastic explosives.

After training the detector canines to the calibration compound, a series of field trials are performed to test the canine's limits of detection for that compound. Once trained to the calibration compound, the limits of detection are determined by performing scent line-ups in which various amounts of the compound will be exposed and the lowest concentration of compound for which the canine can still alert to will be recorded. This test is repeated with the same canine and with multiple canines under similar conditions until reliable statistical analyses can be performed.

The development of a universal non-target calibration compound for detection canines will increase the value of the detection canine's responses. By defining the working parameters of the detection canine, the responses to specific odors will withstand greater scrutiny from the legal system as the handler will be able to provide documentation that the detection canine was working within acceptable limits when the tests were completed thus making the detection canine as objective and reliable as a laboratory instrument.

Detection Canines, Calibration, Detection Limits

 ** Presenting Author*