Determination of the Odorant for Canine Detection of Synthetic Cathinones for the Development of a Controlled Mimic Permeation System (COMPS)

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Overview

- Dogs and Training
- Canine Detection
- Synthetic Cathinones
- Research Proposal
- Odorant Determination
- COMPS

Working Dogs

Herding: working animals that assist with the day to day operations of other farm animals

Tracking/Hunting: working animals that assist with the tracking of various animals for gaming/hunting persons, including finding runaways

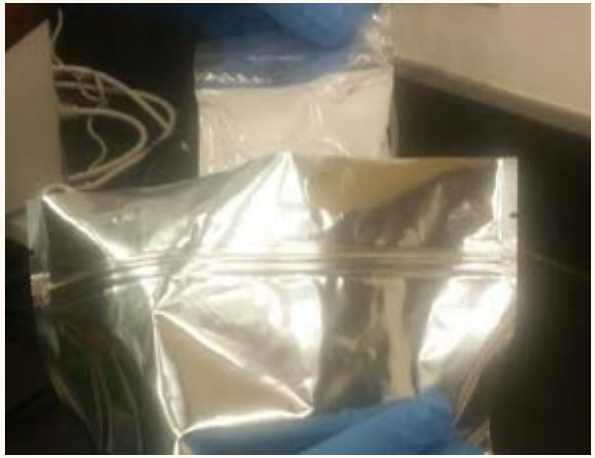
Show: working animals that work on set of films or commercials and compete in various competitions

Service: working animals that assist with walking, behavioral issues, and medical purpose for humans

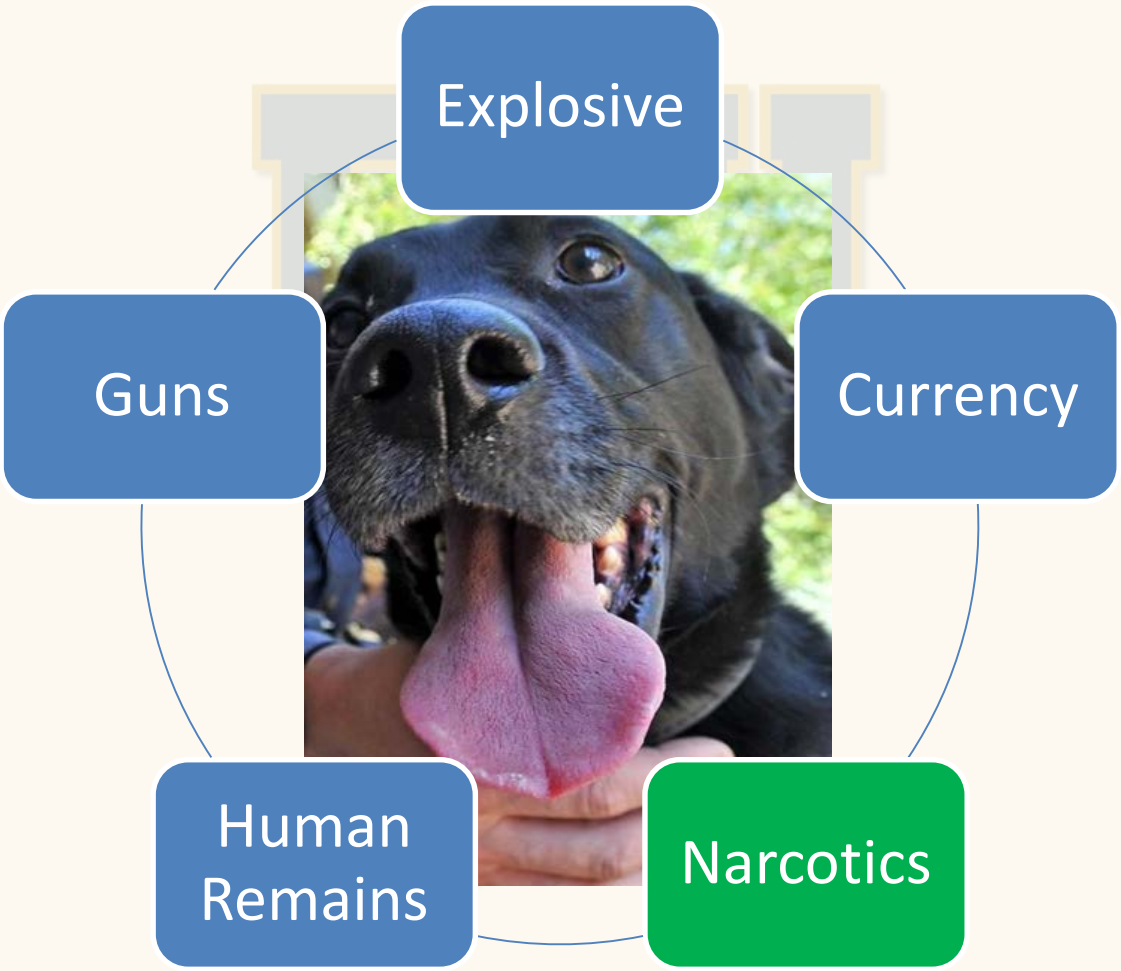
Police: working animals that assist with law enforcement for the detection of illicit material

Training Methods for Police Dogs

- Training duration:
  - Weekly or Biweekly training session to reinforce detection
  - Between 1-3 hour training days
- Training substance:
  - Illicit material
  - Mimic aid
- Illicit substance:
  - Actual controlled material
  - Canine allowed to directly engage with the substance
- Pseudo substance:
  - Safe, non-hazardous system containing active odorant mimicking the smell of a substance
  - Controlled Odor Mimic Permeation System (COMPS)

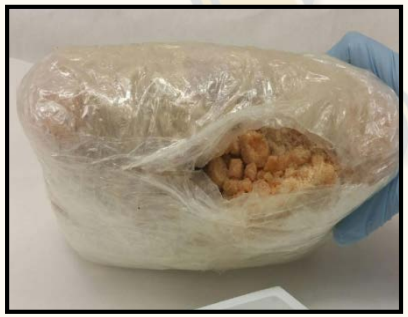


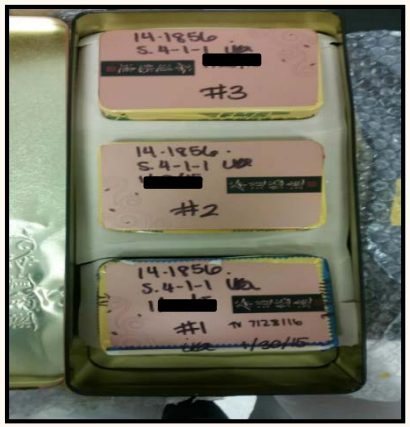
Canine Detection



What's a bath salt?

- Derived from Cathinone
- Coloration/Consistency: Rock formation in various colors
- Marketing: Online (wholesale/retail), headshops, gas stations
- Consumption Range: 10mg-250mg
- Legislation: Schedule I drugs
- More than 80% of synthetic cathinones cross the borders into Florida undetected





Objective A

Assessing the detection capabilities of narcotic detection canines for Synthetic Cathinones

Objective B

Determination of the odorant facilitating the alert for detection

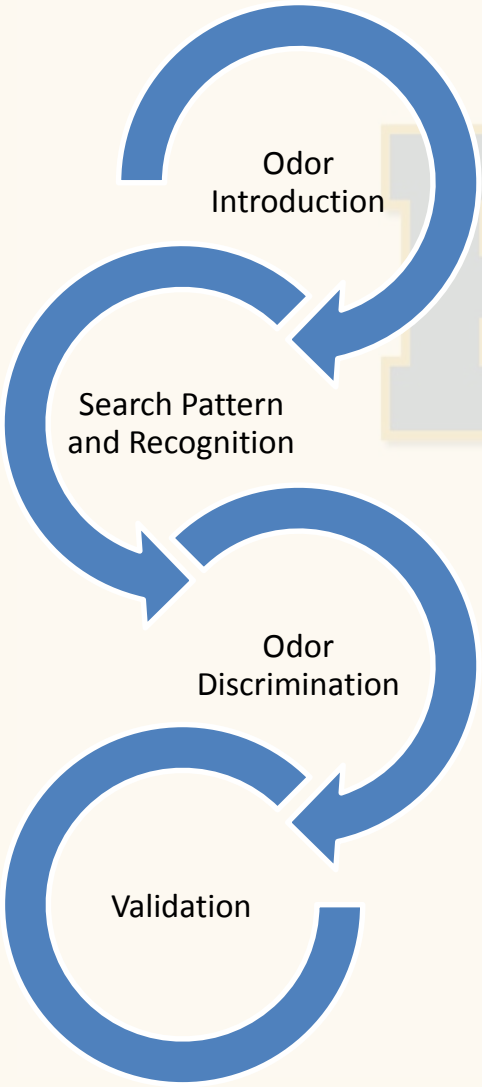
Detection Capability

- Current Detection Capability:
  - Canines currently are unable to detect synthetic cathinones smuggled into Florida
- Canine Trials:
  - Current deployed narcotic detection teams
  - SWGDOG Guidelines
  - Alert: Passive indication of target odor (sit or laying down)
  - Interest: Prolonged “sniffing” motion or interest in odor
  - No Alert: No indication of target odor present

Canine Detection Trial of Various Bath Salts C(n=7)			
Hidden Component	Alert Rate (%)	Interest Rate (%)	No Alert Rate (%)
Blank	0.0	0.0	100.0
PC1	100.0	0.0	0.0
PC2	100.0	0.0	0.0
16-065213	0.0	14.3	85.7
14-856	0.0	14.3	85.7
15-02953	28.6	0.0	71.4
14-726	0.0	14.3	85.7

Key	
Blank	PC pipes
PC1	Marijuana
PC2	MDMA
16-065213	Ethylone case 1
14-856	PVP case 1
15-02953	Ethylone case 2
14-726	PVP case 2

Imprinting



Validation of Successful Odor Recognition C(n=12)		
Component	Group A Combined Alert Rate (%)	Group B Combined Alert Rate (%)
Blank	0.0	0.0
Marijuana	100.0	100.0
MDMA	100.0	100.0
Case 14-856	100.0	100.0
Case 16-065213	100.0	100.0
Case 15-02953	100.0	100.0
Case 14-726	100.0	100.0

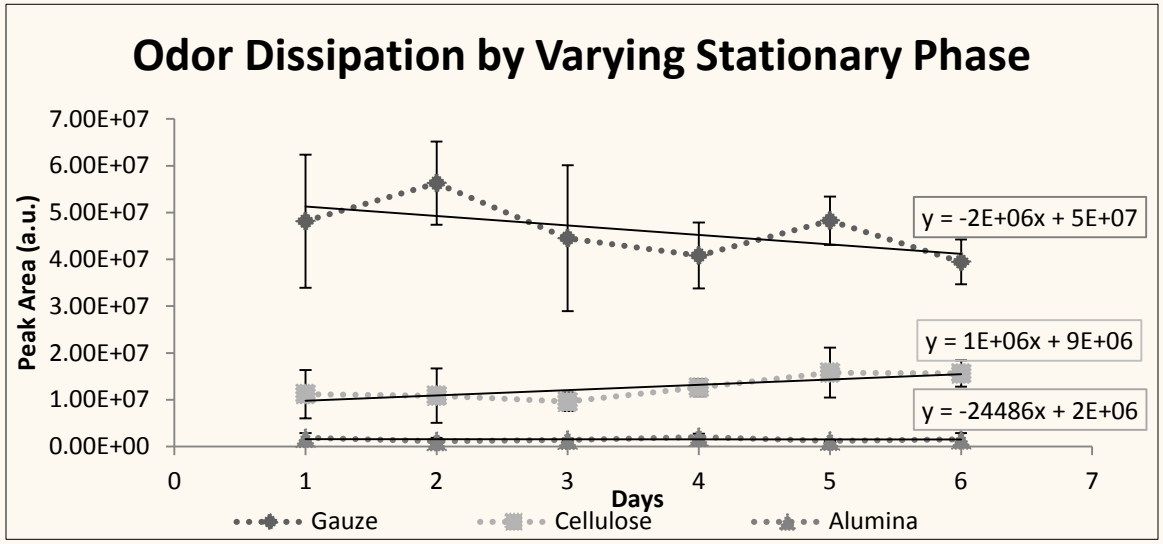
Odor Introduction

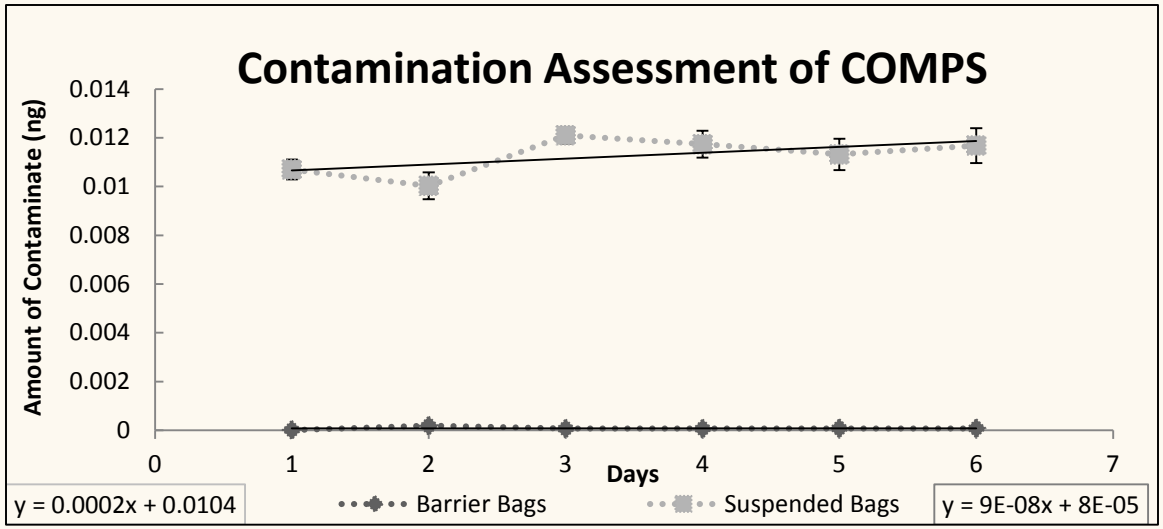
C(n=12)		
Component	Group A Combined Alert Rate (%)	Group B Combined Alert Rate (%)
Blank (3x)	0.0	0.0
Marijuana	100.0	100.0
MDMA	100.0	100.0
Odorant A	14.3	0.0
Odorant B	14.3	16.7
Odorant C	20.0	0.0
PVP standard	20.0	0.0
Odorant D	80.0	93.3
Odorant E	0.0	0.0
Ethylone Case	100.0	100.0
PVP Case	100.0	100.0

- Spiked Gauze:
  - 10 µl liquid
  - 10 mg (10% w/v) solid
- Single and binary mixtures

COMPS Development

- Analytical technique: Solid Phase Microextraction
- COMPS Optimization:
  - Binding absorbent
  - Permeable bag's polymer chemistry
  - Containment method





Future Direction

Questions