

# KÄRSA

#### Cutting edge MS based techniques to detect explosives

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# So what, who cares?

- Space: Screening cargo and mail for explosives (and other threats)
- Problem: False negatives, false positives, laborious
- Solution: Mass spectrometry based detection
- TRL: 6, Demonstrated on explosives at airport, currently extending to more explosives, drugs, TIC, CWA....
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### Why APCI-ToF-MS?

- APCI
  - The most sensitive ionization method
  - Selective, less background
- MS
  - The most sensitive detector
- ToF
  - All the threats all the time
  - High resolution needed to separate the threat from background

# PNNL collaboration

- Successfully combined PNNL flow tube inlet with Karsa TOF
- Same sensitivity as triple quad
- Simultaneous detection of multiple threats.



 High resolution TOF to separate threats from background present at same mass



# K1000 proto

#### 2016

- 9000 bags scanned at airport
- << 1% false positives</p>



#### 2017

- Pivot to air cargo and vapor detection
- Successful detection of tiny amounts of explosives in 1 m<sup>3</sup> boxes
- Successful sample detection from external govt. lab



### Scenthound™

Screening Air Cargo for Explosives Vapours

First certified product of its kind for upcoming ECAC Explosives Vapour Detection (EVD) standard



### Karsa and DHS

- Focused team of experts to solve sampling problems utilizing ultra sensitive, robust detection system
- Proven touch less detection of explosives particles and vapors
- AI and ML algorithms to detect threats in complex cargo background need data
- Looking for funding to increase TRL and adapt to TSA requirements