



UNIVERSITY OF
LEICESTER

INTREPID
Forensics

Interdisciplinary Training and Research Programme
for Innovative Doctorates in Forensic Science

Effects of High Temperature and Explosions on Forensic DNA

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Search World News Atlas:

Search

World News (12)

- World Disasters (1498)
- Middle East (1736)**
- Gulf (170)**
- United Arab Emirates (108)**
 - Politics (27)
 - Crime (26)
 - Business (16)
 - Sports (28)
 - War & Army (4)
- Disasters (28)**
 - Fire (18)
 - Aviation Disasters (11)
 - Weather Related (1)
 - Sea Disaster (1)
 - Power Outage (2)
 - Explosion (1)
 - Structure Collapse (2)
 - Skyscraper Fire (3)

Disasters, February 2018

- 2017 (1)
- 2016 (6)
- 2015 (6)
- 2014 (6)

Bollywood (18) Firefighter (4) Router-on-die (7) Russia Aviation Disasters (88) Dubai Aviation Disasters (5)



United Arab Emirates on Google Map

1. 2018-02-25 Bollywood star Sridevi Kapoor 'drowned in hotel bath' Jumeirah Emirates Towers, Dubai
2. 2017-08-03 Large fire rips through Dubai's Torch Tower
3. 2016-12-12 Fire breaks out in high-rise on Dubai's palm island Palm Jumeirah, Dubai
4. 2016-08-03 Firefighter killed after jet crash-lands in Dubai with 200 people on board
5. 2016-01-28 Fire breaks out at skyscraper in United Arab Emirates Ajman One, Ajman, United Arab Emirates
6. 2016-01-01 Dubai seeks cause of massive hotel fire at New Year
7. 2015-12-31 Fire sweeps through Dubai skyscraper

Residential Fire Main Event: Fire sweeps thr...

Legend

- Fire
- Weather Related
- Structure Collapse

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- Crime and Incidents involving Fire, Explosions, and other sources of high temperature.
- Post-PhD ambition to study Crime, Security and Safety globally, across disciplines, with a focus on the *MENA* region.

Grenfell Tower – London, June 14 2017

Accidental Fire

71 deaths

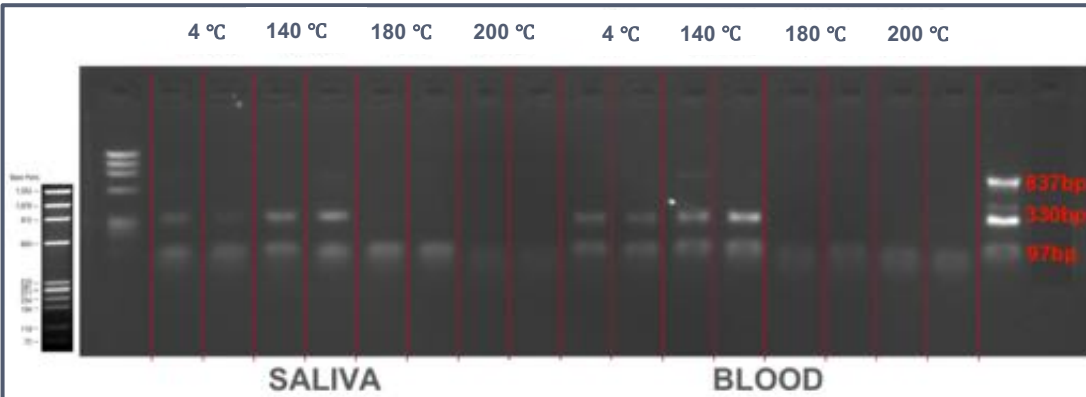
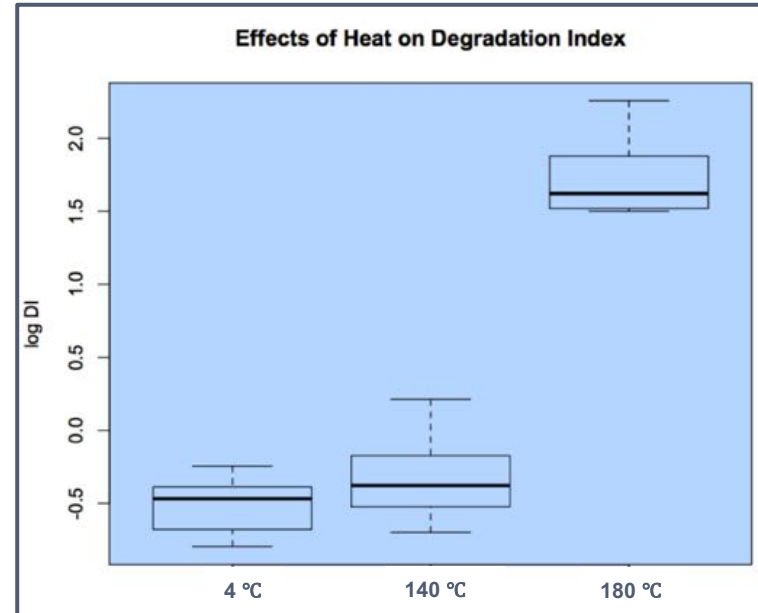
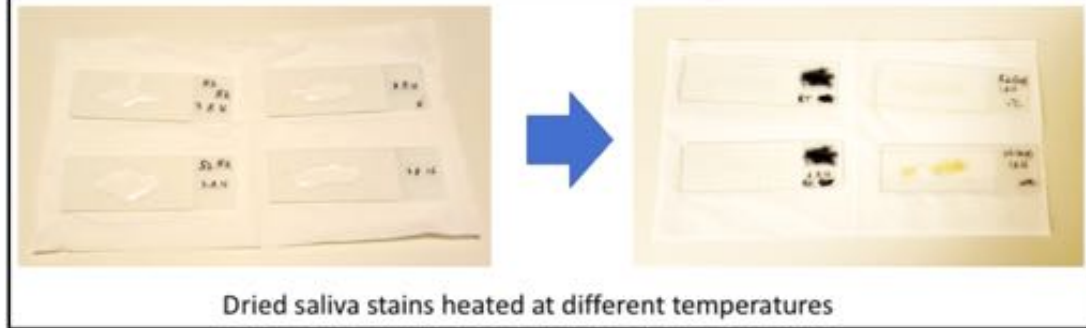
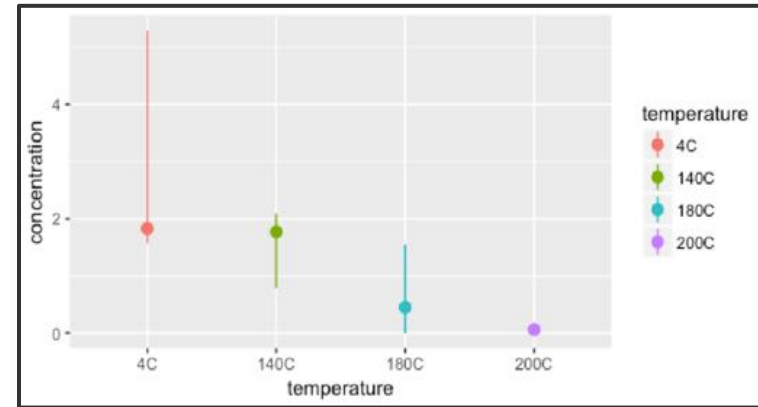
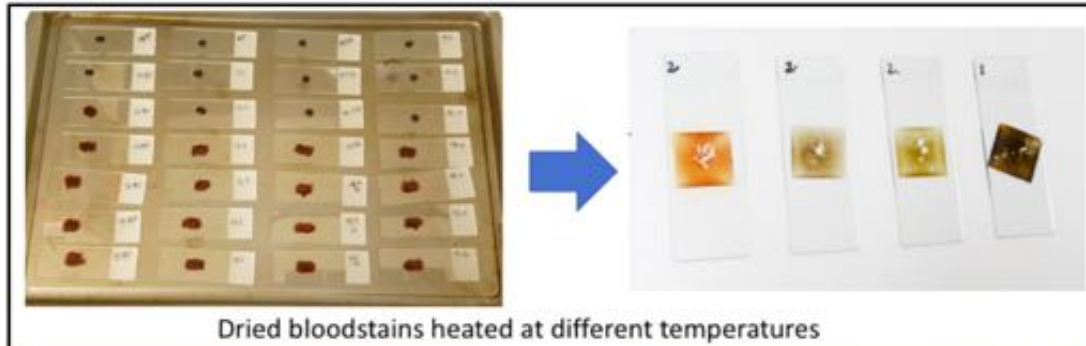
Challenging identification ...

① Scotland Yard says it could take until the end of the year or longer to be sure how many people died in the
Photograph: David Levene for the Guardian

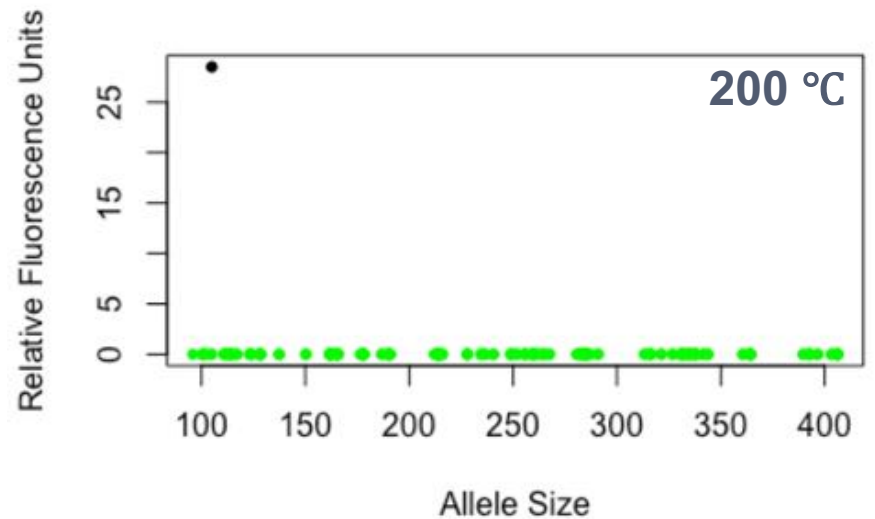
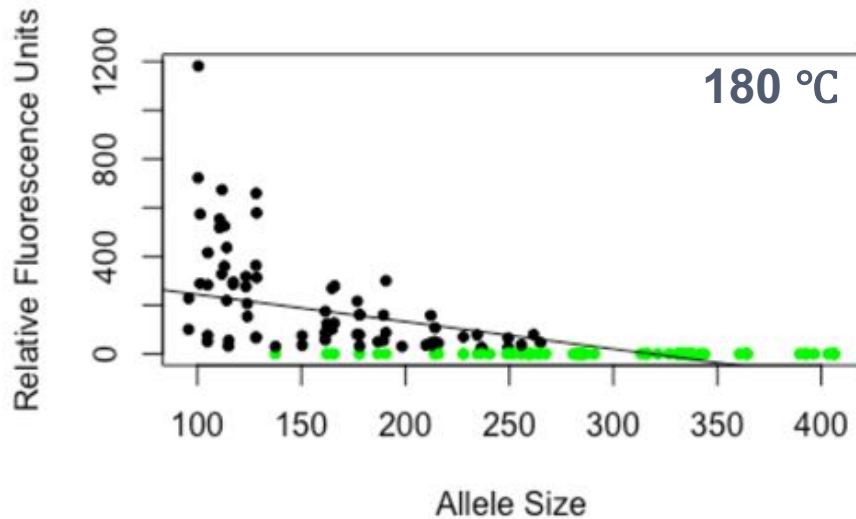
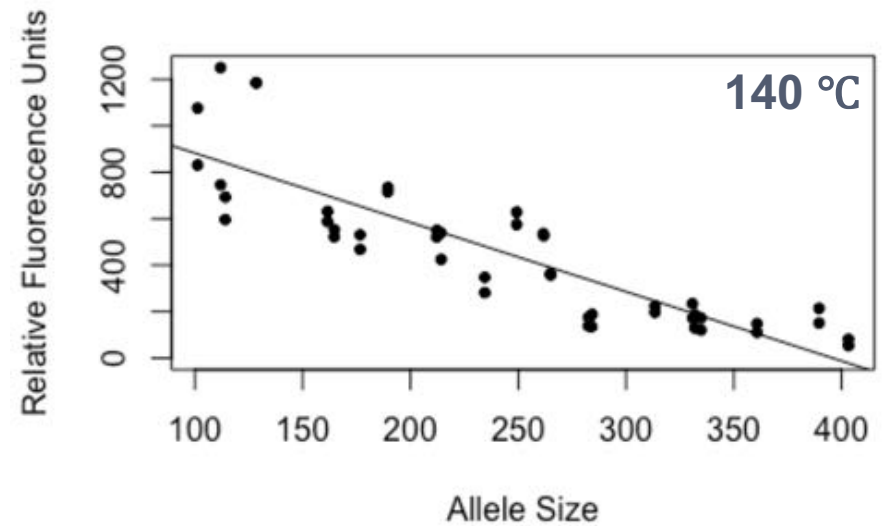
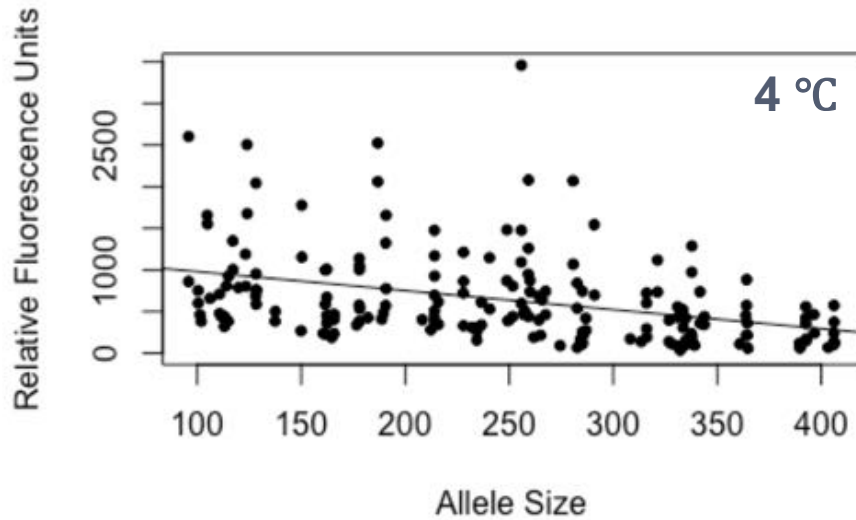


- Testing the effects of fire on DNA.
- Interdisciplinary training with Academics, Police and Industry partners.

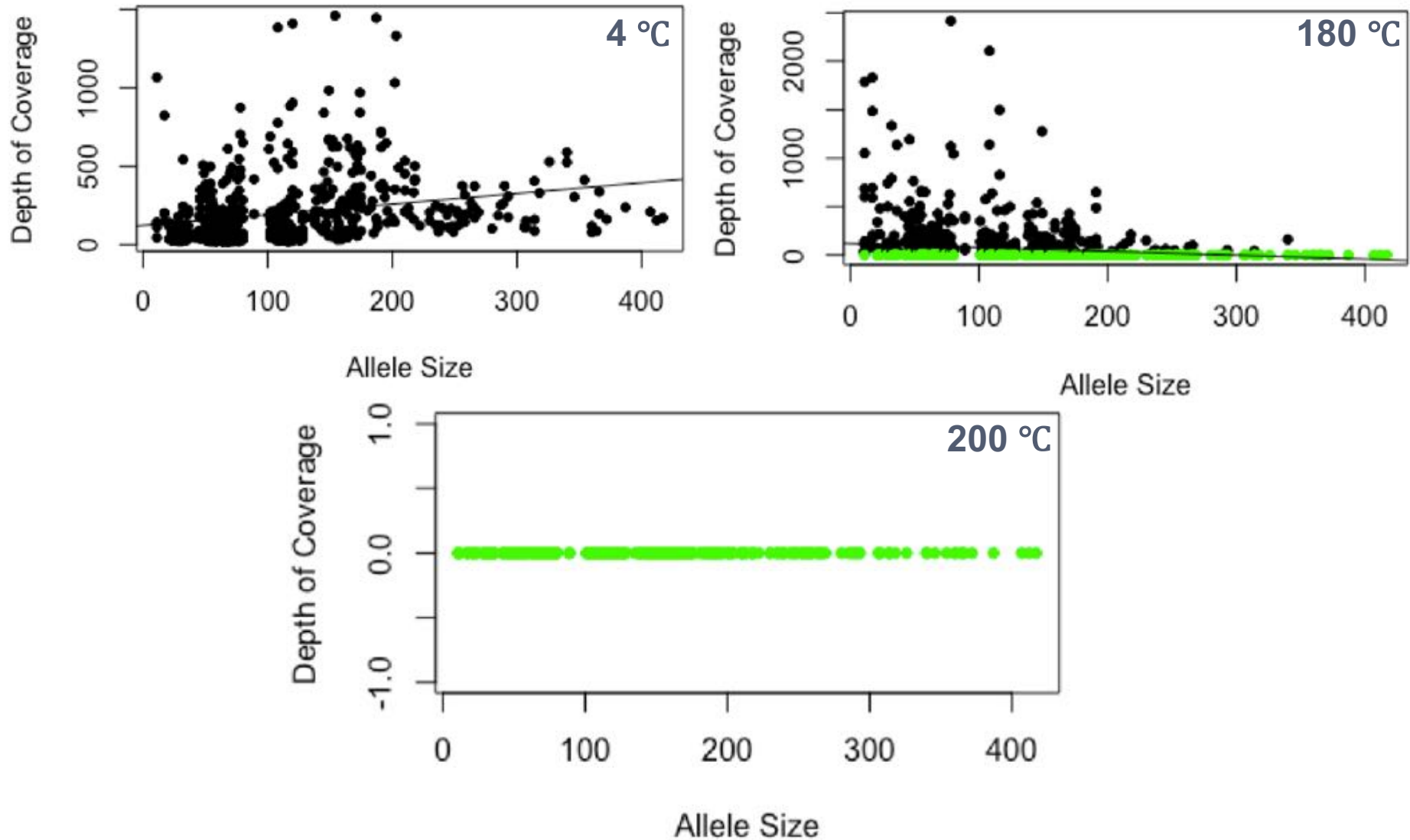
High Temperatures (140,180, 200 °C)



High Temperature on 23 YSTRs-CE



High Temperature on Auto/Y/SNPs-MPS



World Trade Center – New York, September 11 2001

Terrorism

3000 deaths

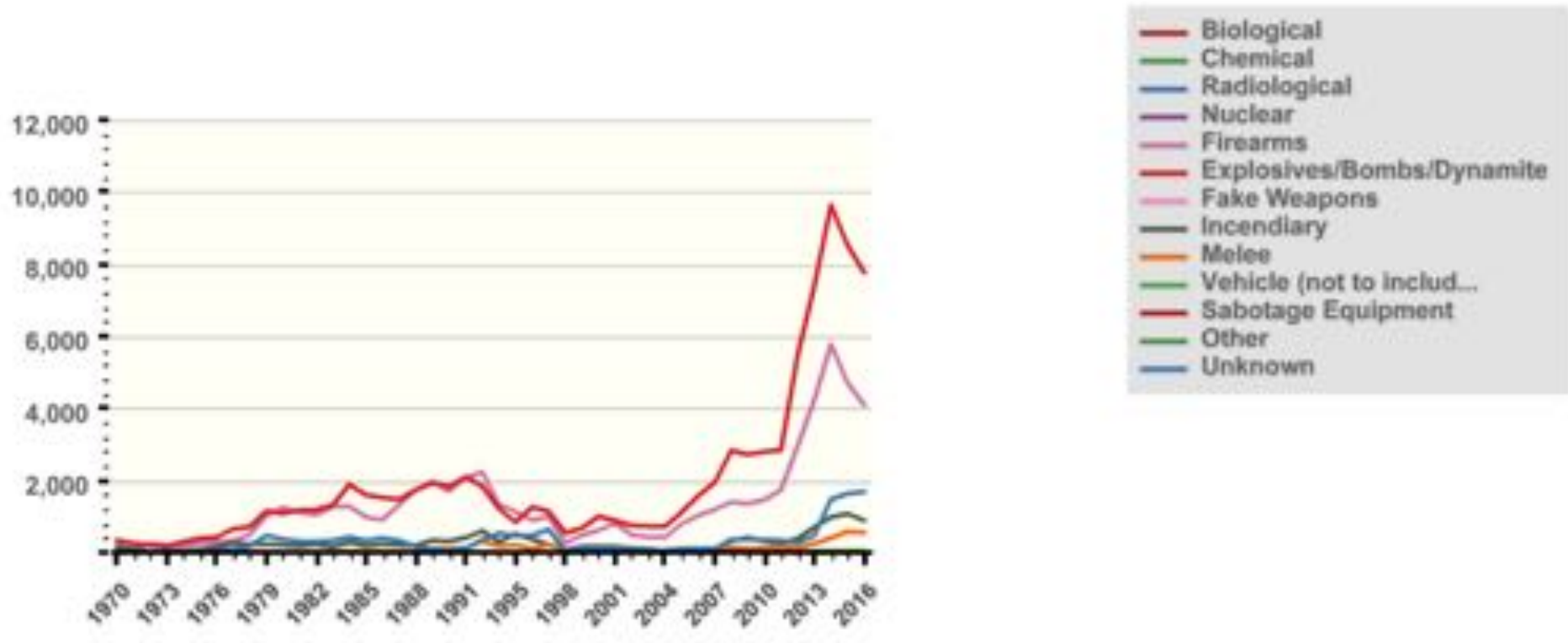
DNA ID success: 65%

Explosions ... Followed by Fire



19 October 2012, Beirut – Lebanon (bbc.co.uk/news/in-pictures-20008421).

Terrorism - Predominant Use of Explosives



National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2017). Global Terrorism Database. Retrieved from <https://www.start.umd.edu/gtd>



- Testing the effects of explosions on DNA.
- Collaboration with US Law Enforcement (FBI, ATF and local Police Bomb squads) and Academics (Penn State University).



Google Earth

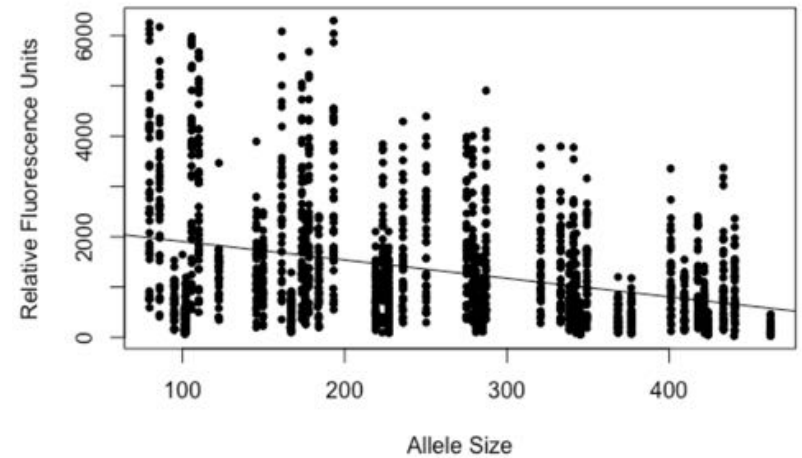
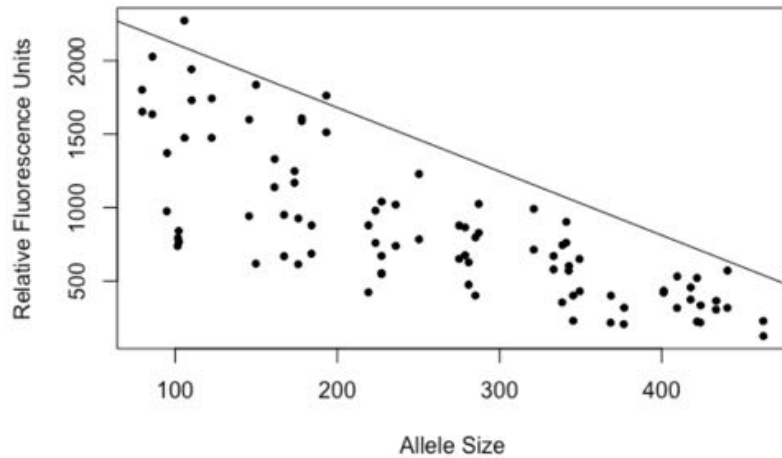


Google Earth

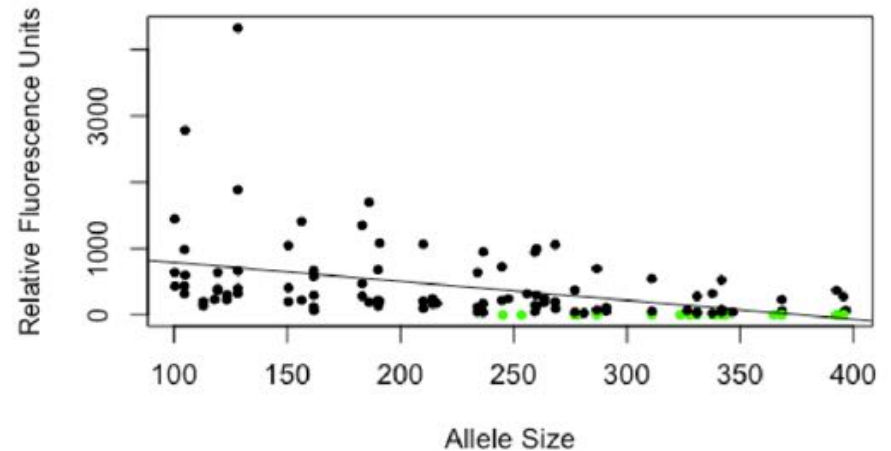
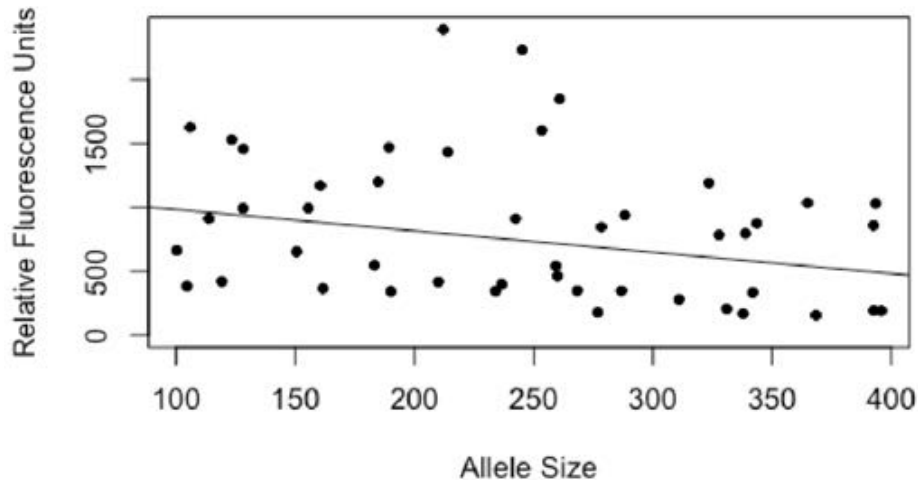
Post-Blasts Items Collection



C4 explosions (Auto & Y – CE)



DBSP explosions (Auto & Y – CE)





C4 Flame duration \approx 40 milliseconds.



DBSP Flame duration \approx 850 milliseconds.

Summary of Works Completed

- PhD results:
 - 140°C: full profile, good quality.
 - 180°C : partial profile, degraded DNA.
 - 200°C : null result.
 - C4 explosion (outside): full profile, good quality.
 - C4 explosion (inside): no recovery.
 - DBSP (outside and inside): 61.5% partial profile, degraded DNA.
- Forensics (and Criminology) training programme.
- Collaboration with US Law Enforcement and Academics.

MENA PROJECT

- #scienceforjustice #scienceforsecurity.
- Studying, Solving and Preventing Crimes, Disasters and other Threats.
- Best use of Resources and Technology.
- Collaborating with Fellow Law Enforcement and Academic Institutions.
- Building and Maintaining the citizen's Safety, Security, and sense of Justice.



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