

PLANT : Priority to threats posed by plant toxins: management, detection, forensics and therapeutics in a bioterrorism incident taken to the next level



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Abstract:

Our objective is to build an adequate response to manage bioterrorist attacks from plant toxins (ricin and abrin) through specific actions: detection and lab confirmation technologies, law enforcement with public health and scientific institutions, evaluation of decontamination of crime scenes and therapeutic solutions.

CONTEXT and OBJECTIVES

Plant toxins are a focus of concern by public health and law enforcement on national and international levels due to the increasing threat of their deliberate release in a bioterrorist attack as exemplified by the Cologne event in 2018 and similar terrorist activities in France. Among them, ricin and abrin are of particular interest owing to their worldwide availability, ease of preparation, high morbidity and the lack of medical countermeasures.

This has challenged France and Germany to reinforce our ability to respond to potential plant toxin attacks and to link police forces from both countries.,

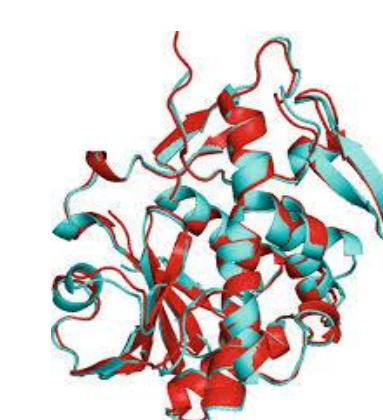
METHODOLOGY and RESULTS

We will intend to develop novel technologies for on-site crime scene detection, lab confirmation, forensics analyses, decontamination and therapeutic solutions. They will be based on a combination of state-of-the-art technologies and evaluation of drug combinations. In parallel, police forces from France and Germany will be associated for developing procedures and implementing these technologies that will be shared among federal agencies, first responders and special units. Intellectual property is associated with our developments (detection technologies and therapeutic solutions) and should lead to potential industrial developments and communication through meetings and publications. The project is linked to an educational program associating scientists and students which will ensure post-program collaborations and continuation to former and existing programs between France and Germany (former Gefrease ANR-BMBF project and on-going European program Eurobiotox).

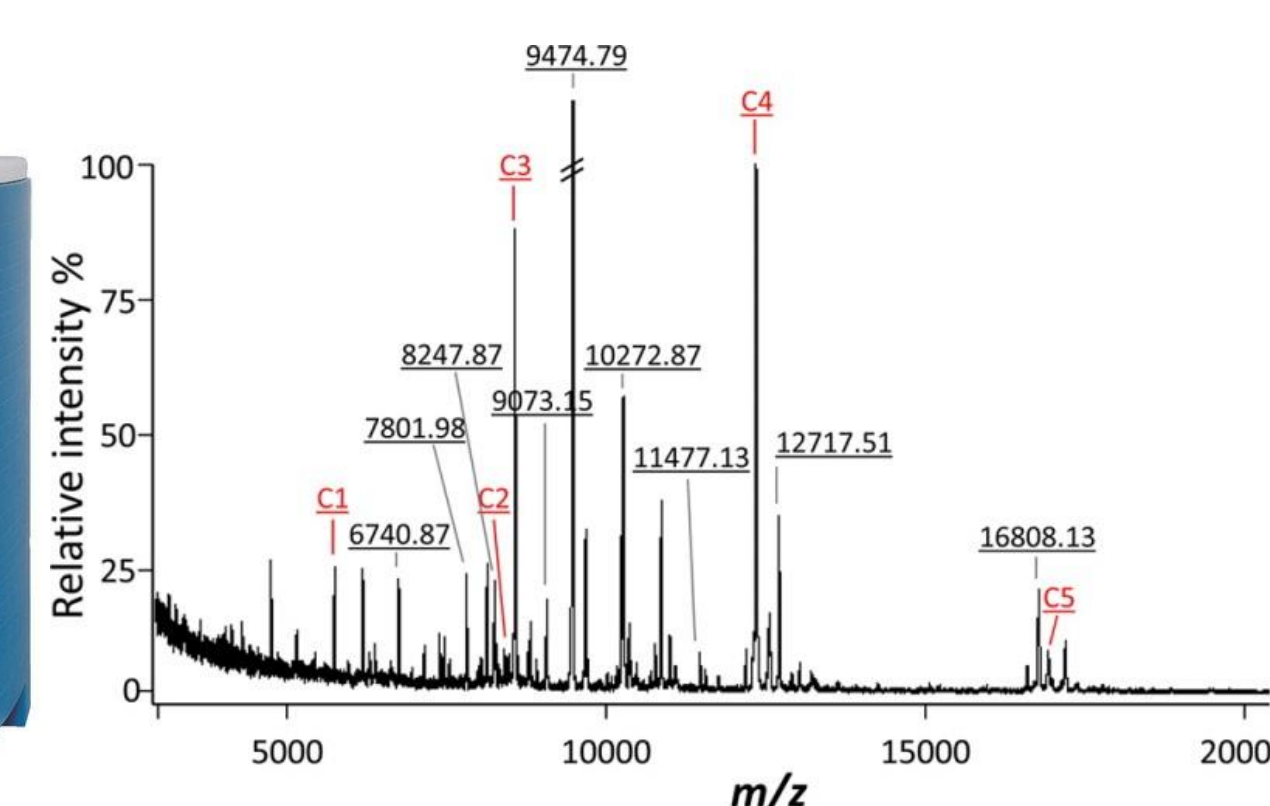
Overall, the PLANT project is a cornerstone for a better crisis management based on recent challenges, and will contribute to increase the civil society resilience in in both countries.



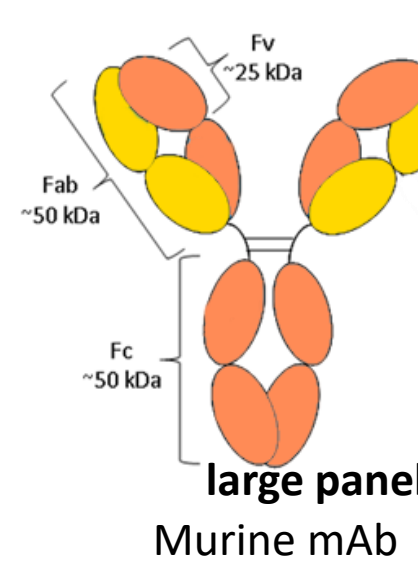
Toxin plants (Ricin and Abrin)



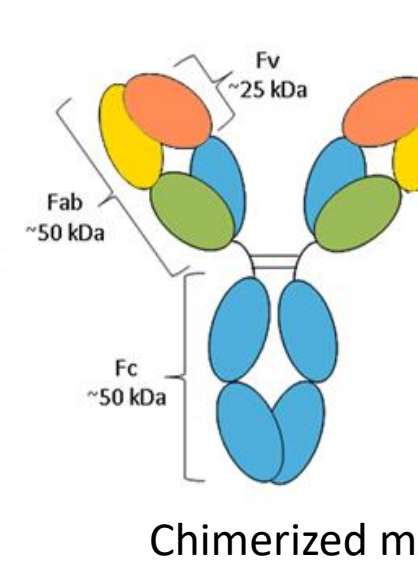
Seeds from ricin and homologies between ricin and abrin toxins



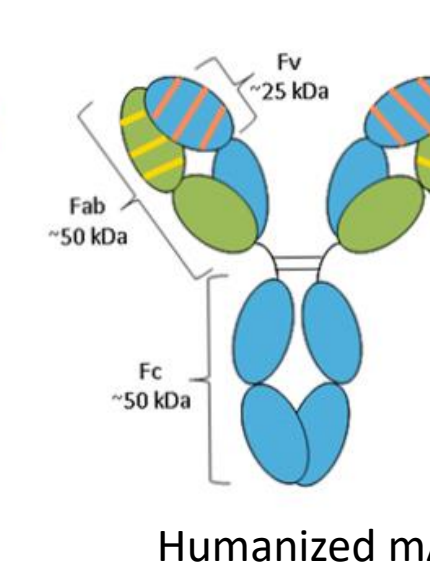
Immunoassay and mass spectrometry (used along with Raman, RMN, PCR..) for detection/forensic/diagnostic



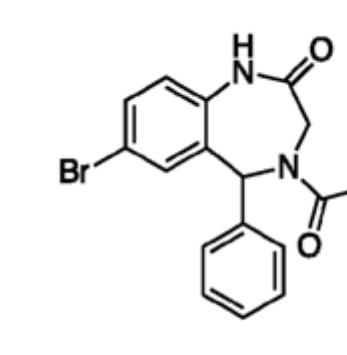
large panel
Murine mAb



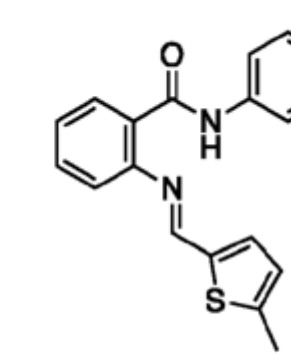
Chimerized mAb



Humanized mAb



Retro-1



Retro-2

Therapeutics solutions : Neutralizing antibodies and combination with chemical drugs

