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Biodefense the Challenge for a New Microbial Hunter

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Commentary

The intentional use of biological warfare agents (BWAs) as a threat to public health it must be seriously considered by researchers in microbiology and the drug developers, as well as a challenge for the implementation of new diagnostic methods and devices [1]. Also requires from medical staff design protocols for clinical management of patients likely affected by a situation of this type [2]. Therefore, training in medical schools should be conducted aimed at an optimal emergency response that prevents dissemination and increases the protection of the population, in this way initiatives in diagnostic preparedness have been introduced for improve innovation and attention in outbreaks cases [3]. In this way, public health emergency management protocols must be implemented with international collaboration, multidisciplinarity and standard which include the following items [4]

1. Coordinate the early and effective response among the different actors of the health system.
2. Collect, integrate, analyze and correlate field epidemiology data with laboratory tests; also share information in a multi-trans and interdisciplinary way.
3. Develop and implement guidance documents with recommendations to address affected populations and at potential risk.
4. Coordinate the application of control measures, as well as the distribution of medical supplies.

Therefore, a new class of microbial hunter is required; belonging to a multinational research team, such a team should be integrative, inclusive and able to solve problems from a multivariate analysis of the phenomena. Equally, there are other problems associated with bioterrorism, such as the generated panic that induces an increase in the consumption of antimicrobials that can lead to the appearance of antimicrobial resistance [5]. So it is necessary to improve the number of medicines against *Bacillus anthracis*, *Francisella tularensis*, *Yersinia pestis*, *Brucella spp*, *Burkholderia mallei* and *pseudomallei* which are the bacteria most frequently used to develop this type of attack [6]. Also the new microbial hunters have to detect and investigate the possible motives of the bio crime modality (microorganisms applied to murder, extortion and revenge) [7], which make the scenario more complex by including psychological profiles within microbiological investigations, merging infectious diseases with forensic science.

On the other hand, the possibility of using superbugs as weapons, due to their capacity for transmission and infection it introduces a new pressure factor to the pharmaceutical and diagnostic methods industries [8], as well as the emergence of new methods of synthetic biology (CRISPR Cas9) requires that governments certify the scientific work developed in the different laboratories that use these protocols and belong to Organization for Economic Cooperation and Development (OECD) [9].

In this microbiopolitical environment it is necessary to establish new strategies to detect microorganisms in various fields such as food security, medical diagnosis, water quality and bioterrorism [10]. By establishing this connection, a rational approach will be ensured that seeks security and quality of life for citizens. Equally, in the globalized world there are possibilities that non-native vectors are unidentified reservoirs of microorganisms altering its life cycle and its pathogenicity, which becomes a new threat to the ecosystems and the human beings who live with them [11].

Likewise, treatment for bioterrorism-related cases must be grounds for investment, study and research; wih the end of develop new therapeutic approaches that reduce mortality and dissemination [12]. Thus, a greater arsenal of medicines will be a priority to be prepared against possible threats.

Finally, in this confluence of perfect storms a joint action is necessary, an action from which a new paradigm of microbial hunter emerges willing to address the great public health problems of our time; it able to integrate anti-infective therapy, bioinformatics, nano sensors and bio containment. In addition, this field requires close collaboration between scientists, industry and political decision makers to achieve policies, laws and protocols that improve the protection and health of the population.

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