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Biological Agents with Potential for Bioterrorism

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Perspective

Biological weapons agents were identified during the Cold War based on the following characteristics: pathogenicity for humans, animals, or plants; ability to cause disability or death; stability and infectivity as small particle aerosols; and ability to be easily and quickly produced and weaponized in munitions or delivery systems. Other properties of biological agents, such as the relative ease of medical prevention or treatment, and the possibility of harm to the perpetrator, have been included [1]. The Centers for Disease Control and Prevention (CDC) in the United States recognised germs, viruses, and poisons that might be used as weapons. They classified them into three classes in 2002: A, B, and C, based on their ease of spread, severity of illness produced, and ability to cause mortality. Infectious and contagious biological agents, infectious but not generally contagious biological agents, and poisons if neither are infectious and contagious biological agents classified as Category A posed the highest threat to public and national security. Tier select agents and poisons, a relatively recent classification, is similar to the category A classification [2]. Other agents, such as naturally occurring pathogens, cause diseases with a medium risk to the general public. They include new and re-emerging infectious diseases and are somewhat easy to distribute. Genetic changes, on the other hand, could make them more virulent, create unusual clinical symptoms, increase their resistance to treatment and vaccinations, and even change their transmissibility or host range. Synthetic biology methods could be used to make genetic alterations; such activities could be considered dual-use research.

The 1918 Spanish influenza pandemic virus, for example, was rebuilt in 2005, and the poliovirus was synthesised over 20 years ago. In 2001, an immuno-modulatory gene was added to the mousepox viral genome, rendering a mousepox vaccination ineffective, and similar technology could be applied to other diseases. the virus that causes smallpox [3]. The recent synthesis of the extinct horsepox virus serves as a reminder that the smallpox virus may be rebuilt, and that the restrictions in place to prevent the misuse of strong, inexpensive, and globally available technologies need to be revisited. This possibility has also raised the question of whether research findings should be restricted or even refused publication when the risk of harm is too great. Although bioterrorist chemicals could be spread in a variety of ways, the aerosol approach would likely provide the most exposure. Depending on the number of persons first exposed, the average number of people who acquire the disease from one sick individual and the disease generation period in humans, contagious agents could result in a large number of second and later generation cases. For example, the R0 of pneumonic plague is thought to be around, while the R0 of smallpox is thought to be around. The number of instances of non-contagious infections, such as inhalational anthrax, is almost entirely determined by the size of the population exposed and the timing of post-exposure antibiotic prophylaxis. Aerosolized agents are still the most dangerous hazard, but safety and security are also important. Food and water supply security are also significant aspects of primary prevention. Antibody-based assays are being developed as new approaches for detecting poisons in food. Rapid diagnoses become even more important in the event of a bioterrorist attack, due to both health and security concerns. Diagnostic capabilities have advanced significantly since the 2001 anthrax letters. The speed and low cost of sequencing capabilities have been some of the most significant breakthroughs in the last decade [4].

Sequencing methods have grown less expensive, more portable, and multiplexed thanks to highly sensitive and selective PCR-based systems combined with contemporary sample preparation procedures. Health-care practitioners around the world may make faster judgments and respond faster for individual care or outbreak detection thanks to fieldable patient-side diagnostics and sequencing outputs that are directly connected via cloud-based networks. A Francisella tularensis fast, cartridge-based assay has been developed for use at the point of care. To diagnose Ebola and Lassa virus infections, a method that combines sensitive microsphere technology to detect both antibodies and antigens is now available.

Although diagnostic ELISA tests for anthrax antibodies are available, a compact approach that combines sample processing and PCR amplification can provide a result in about 90 minutes. A speedy and sensitive approach for detecting smallpox virus has been developed for use at the point of care. It is based on an antibody immuno column for analytical procedures immunofiltration and gives results in around 45 minutes [5]. Diagnostic electron microscopy, on the other hand, is still considered a quick and effective way to identify smallpox and other viral agents.

References

1. Javed F, Aslam M, Rashid N, Shamair Z, Khan AL, et al. (2019) Microalgae - based biofuels, resource recovery and wastewater treatment: a pathway towards sustainable biorefinery. Fuel 255: 115826.
2. Brar A, Kumar M, Vivekanand V, Pareek N (2019) Phycoremediation of textile effluent-contaminated water bodies employing microalgae: nutrient sequestration and biomass production studies. Int J Environ Sci Technol 16(12): 7757-7768.
3. Rashid N, Park WK, Selvaratnam T (2018) Binary culture of microalgae as an integrated approach for enhanced biomass and metabolites productivity, wastewater treatment, and bioflocculation. Chemosphere 194: 67-75.
4. Arif MS, Riaz M, Shahzad SM, Yasmeen T, Buttler A, et al. (2016) Contrasting effects of untreated textile wastewater onto the soil available nitrogen-phosphorus and enzymatic activities in aridisol. Environ Monit Assess 188(2):1-15.
5. Kumar G, Huy M, Bakonyi P, Belafi-Bako K, Kim SH (2018) Evaluation of gradual adaptation of mixed microalgae consortia cultivation using textile wastewater via fed batch operation. Biotechnology Reports 20: e00289.

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