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Journal of Defense Management

Short Communication

Ways of Science to Improve Biodefense

Bubeck Sampath*

Department of Defense Management, Jamia Millia Islamia University, Jamia Nagar, Okhla, New Delhi, India

DESCRIPTION

Our knowledge of cellular and molecular biology has almost reached the point where it could be possible to suggest the signs and symptoms of a fictitious sickness and then design or produce the pathogen to cause the desired disease complex [1]. Designer diseases may function by suppressing the immune system, by forcing particular cells to multiply and divide quickly (like cancer), or possibly by having the opposite impact, such as starting programmed cell death (apotosis). This cutting-edge biotechnology would blatantly demonstrate an order-of-magnitude improvement in the capability of offensive biological warfare or terrorism.

The six groups of biological breakthroughs that potentially be weaponized, as described by the JASON Group and covered above, share some ideas and techniques. These courses were created with the goal of identifying a range of potential bioterrorist threats based on existing or anticipated biotechnological capabilities. They weren't intended to be exhaustive or to rule out other options [2]. Malcolm Dando, a leading expert in biological warfare, claims that it's possible to genetically modify benign microbes to produce BW poisons, bioregulator substances, or venoms. Moreover, pathogens may be genetically altered to increase their aerosol or environmental stability or to thwart the powers of identification, detection, and diagnosis [3].

Understanding the human genome

The Human Genome Project will have a significant impact on the pace of molecular biology research and aid in the understanding of the most puzzling and challenging aspects of life. The whole sequence of events that take place in a human cell after an infection with a pathogen or the uptake of a toxin molecule should be able to be analysed thanks to new innovation. It will become evident what factors contribute to a person's susceptibility to infectious diseases. Almost 50% of all human genes currently have unknown functions [4, 5]. These unanswered questions should be clarified by functional genomics investigations, which will also make it possible to build new preventative and therapeutic approaches, such as vaccinations and antibiotics [6].

Biological agents that target particular ethnic groups have been reported. Though theoretically possible, "biological ethnic cleansing" is generally doubted by experts. To date, research on the human genome sequence has not turned up any polymorphisms that may be used to definitively classify ethnic groups. There is less genetic diversity in human populations than in those of other species, according to a number of studies, and the majority of diversity is found inside rather than between ethnic groupings [7].

Boosting the immune system

The full sequencing of the human genome also offers a fresh starting point for a deeper comprehension of the human immune system and potential manipulation of it [8]. This offers excellent protection from biological warfare. Dr. Ken Alibek is currently attempting to develop defences against the use of biological weapons after years of work in the FSU to genetically design diseases for biological warfare. He is looking into ways to strengthen the immune system so that it can better protect the body from infectious diseases [9]. He is working on cellular research that could help develop a defence against anthrax as one of his first efforts [10]. In an effort to go beyond the "one bug-one medicine" historical strategy, comparable immunological research being conducted in other labs shows considerable potential in enhancing the whole human immune response to microbial infection.

CONCLUSION

The ability of bacteria to produce pathogen-fighting bioregulators can also be altered. For instance, interferon, a naturally occurring protein with antiviral efficacy against a number of viruses, has been genetically engineered into *E. coli* to be produced in commercial quantities. A Bactericidal/ Permeability-Increasing protein (BPI) developed by Xoma Corporation using recombinant DNA (genes inserted into DNA sequences) technology reverses the resistance of some bacteria to

Correspondence to: Bubeck Sampath, Department of Defense Management, Jamia Millia Islamia University, Jamia Nagar, Okhla, New Delhi, India, E-mail: Sampathbu123@yahoo.com

Received: 09-Feb-2023, Manuscript No. JDFM-23-22332; **Editor assigned:** 14-Feb-2023, PreQC No. JDFM-23-22332 (PQ); **Reviewed:** 07-Mar-2023, QC No. JDFM-23-22332; **Revised:** 14-Mar-2023, Manuscript No. JDFM-23-22332 (R); **Published:** 21-Mar-2023, DOI: 10.35248/2167-0374.23.13.264.

Citation: Sampath B (2023) Ways of Science to Improve Biodefense. J Defense Manag.13:264.

common antibiotics. The hunt is on for additional bioactive proteins that might influence how people react to illnesses.

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