Preparing the Bio/Agro-defense Workforce

Background

Protecting American agriculture — crops, livestock — and food from global biothreats while safeguarding people from zoonotic animal diseases and foodborne pathogens is vital to U.S. homeland security as called out in the 2004 Homeland Security Presidential Directive-9 (HSPD-9). The 2018 National Biodefense Strategy reiterates this crucial mission.

Kansas State University stands ready to deliver tailored education and training programs to prepare and maintain the bio/agro-defense workforce needed for our nation's biodefense strategy, specifically for USDA and the National Bio- and Agro-defense Facility (NBAF) being built in Manhattan, Kansas.

Description

Based on the needs assessment developed during the pre-NBAF OPTIC process led by DHS, expectations for the management and operations of NBAF focused on the necessity for training programs for NBAF employees. Personnel needs of NBAF, however, extend beyond the education and training of Ph.D.-level scientists. Specifically, NBAF needs fully trained, competent staff capable of conducting research with select agents (SAs) and working in BSL-2 through 4 laboratory settings with large livestock models.

The K-State Biosecurity Research Institute (BRI) is one of fewer than six high containment facilities in the U.S. that can conduct research on livestock experimentally infected with a broad range of highly pathogenic organisms. The BRI is the designated facility at K-State for work on organisms classified as SAs, and has been a partner with the Plum Island Animal Disease Center in the transition of science to NBAF. BRI faculty and staff have developed world-renowned hands-on training for students and staff at all levels for operating in and managing very specialized facilities. These programs have trained and approved personnel to ensure accountability, safety and security.

The BRI has over 10,000 square feet dedicated to education, including a tiered classroom seating for 25 that adjoins a fully-equipped biocontainment training laboratory. The lab provides hands-on training activities in a pathogen-free area. Students gain foundational skills in a realistic work environment without the risk of biosafety concerns or biocontainment breaches. The training suite also includes world-class high-definition video capture and streaming technology allowing the training and research areas to serve as filming studios for online distance-education courses.

To date, almost 300 individuals have been trained to work with SA pathogens in biocontainment. The BRI trains or retrains an average of 130 people each year. Based on the anticipated workforce needs for NBAF, DHS, USDA-APHIS and the state of Kansas have invested in training programs at the BRI. DHS has supported 11 doctoral researchers and APHIS has committed to five M.S., Ph.D. and D.V.M. students with guaranteed employment at NBAF.

With investments from USDA, K-State and the BRI will be able to expand current capacities in education and training to deliver a comprehensive program to meet future needs. Specifically, APHIS requires foreign animal disease -related technical education along with training and proficiency testing associated with the NAHLN. The ARS has recognized that the partnership between the Arthropod-Borne Disease Laboratory and the BRI will continue to provide trained personnel to address emerging zoonotic diseases and an integrated animal and microbial genomics program. NBAF success will require training with a focus on relevant pathogens, experience working at a particular biocontainment level, and use of both agricultural and wildlife animal species.

Relevance

The proposed training program is in keeping with the five goals articulated in the 2018 National Biodefense Strategy for strengthening the biodefense enterprise, including to "Strengthen biosafety and biosecurity practices and oversight to mitigate the risk of bio-incidents" and "Ensure a vibrant and innovative national science and technology base to support biodefense."

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