Engineering 6 (2020) 1

Contents lists available at ScienceDirect

Engineering

journal homepage: www.elsevier.com/locate/eng

Editorial

Animal Disease Control: Challenges and Perspectives

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Due to more and more frequent long-distance travel and international transactions, outbreaks and spread of animal diseases are significantly increasing around the world, causing enormous losses in animal husbandry and threat to human health, public hygiene, and food safety; sometimes even affecting ecological security.

Viruses, bacteria, and parasites are the three main infectious factors causing animal diseases. Viral diseases such as African Swine Fever, which is still rampant in parts of Europe and Asia, have a catastrophic impact on the pig breeding industry, resulting in numerous pig mortalities, a sharp reduction in hog stock, and a spike in pork prices. Meanwhile, viral pathogens—such as porcine coronavirus, porcine reproductive and respiratory syndrome virus, Newcastle disease virus, hand-foot-and-mouth disease virus, and influenza virus—accumulate genetic mutations frequently. Intensive immune challenges have accelerated the development of new mutant strains that can better evade hosts' immune surveillance, leading to frequent failure of immune protection.

Due to the multiple serotypes of bacterial pathogens such as *Streptococcus suis*, *Haemophilus parasuis*, *Actinobacillus pleuropneumoniae*, *Avian paragallinarum*, and *Escherichia coli*, the prevention of these animal diseases is extremely problematic. Furthermore, with increasing drug resistance of zoonotic bacteria, including *Tubercle bacillus*, *Escherichia coli*, and *Salmonella*, the cure of these animal diseases becomes more difficult.

In terms of parasitic diseases, coccidiosis causes great economic losses to the poultry and rabbit breeding industries. Echinococcosis also acts as a huge threat to cattle and sheep breeding and to the health of herdsmen in pastoral areas. The prevention of parasitic diseases through vaccination is still in its infancy, and very few parasitic vaccines are commercially available. Moreover, drug resistance presents a major hindrance to the cure of parasitic diseases.

To solve the problems described above, fundamental breakthroughs are desperately needed in the intervention of animal diseases. It is necessary to strengthen etiological and epidemiological studies on animal pathogens and the mechanisms of host-pathogen interaction. Efforts should be made to screen new drug targets and develop new products in disease prevention and control, such as novel vaccines, diagnostic agents, and medicines. Ultimately, we need to rely more on environmentally friendly measures, and less on vaccines and medicines.

This special issue on animal diseases aims to enhance international academic communication on the prevention and control of animal diseases through both basic and applied research. We hope that the work reported herein will help to elevate the prophylaxis of animal diseases and promote the sustainable development of husbandry worldwide.

https://doi.org/10.1016/j.eng.2019.11.011
2095-8099/