

Recent advances in host protective immunity and novel disease control strategies against intestinal protozoan infections in commercial poultry

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Poultry meat consumption has increased globally by 50% since 2000, accounting for greater than 100 million tons in 2012. Multiple challenges confront the rising demand for poultry food products, including governmental restrictions on the use of antibiotic growth promoters and novel feedstuffs, high-density production conditions, waste management, and the emergence of infectious pathogens, particularly those that cause intestinal diseases. There is little doubt that in-feed antibiotics has dramatically increased the efficiency of commercial poultry production over the last 50 years. However, antibiotic usage in chickens has raised consumer concerns regarding chemical residues in the poultry products that they consume, and has directly led to the appearance of drug resistance among avian pathogens that has the potential to be transferred to microorganisms that infect humans. Much interest, therefore, has focused on the development of alternative, antibiotic-free methods of commercial poultry production. These newer disease control strategies can be broadly classified into those that are directly cytotoxic against infectious agents, including hyper immune antibodies, antimicrobial peptides, and bacteriophages, and those that augment host immunity, including phytochemicals, adjuvants, and next-generation vaccines. This talk will highlight new approaches which are being developed to protect against avian coccidiosis using passive and active immunization strategies.

Biography:

Dr. Lillehoj received her B.S. degree in Biology from the University of Hartford, M.S. degree in Microbiology from the University of Connecticut, and Ph.D. in Immunology from Wayne State University, School of Medicine. She was a NIH post-doctoral fellow in the Department of Immunology and Microbiology, Wayne State University to conduct research on cancer immunology and immunogenetics of autoimmune diseases. From 1981 to 1984, she was a staff fellow in the Laboratory of Immunology, NIAID, NIH where she studied T-cell immunity. Since 1984, Dr. Lillehoj worked at the Beltsville Agricultural Research Center. She was promoted to the Supergrade (ST) in 2004. Her research career has focused on mucosal immunity, vaccines, immunogenetics and antibiotic alternatives. Dr. Lillehoj developed the first set of commercialized mouse monoclonal antibodies detecting chicken lymphocytes, constructed the first chicken intestinal cDNA microarray which has been of seminal importance in national and international poultry genomics research and developed and commercialized many novel antibiotic alternative strategies. Her research has resulted in more than 404 original papers, 20 book chapters, and 13 national and international patents. She has been awarded more than \$ 20 million in research funding, including 8 CSREES NRI, BARD, IFASA, and Food Safety Initiative grants, and 45 formal collaborations (CRADAs) with private industry. In addition, she has served on numerous editorial boards, national grant panels, award and technical committees, and chaired multiple sessions at national and international meetings. Dr. Lillehoj holds guided the research of 130 junior scientists from 13 different countries. Her accomplishments have been recognized by the BARC Technology Transfer Award (1998), the ARS Technology Transfer Award (1999), the Federal Laboratory Consortium (FLC) Technology Transfer Award (1999), the Helen Cecil Leadership Award (2001), Pharmacia/Upjohn Animal Health Achievement Award (2001), Beltsville Agricultural Research Center Senior Scientist of the Year Award (2003), the ARS Outstanding Scientist of the Year Award (2004), Merck Achievement Award (2006), the Levine P.P Award (2006), the Pfizer Animal Health (Embrex) Fundamental Science Award (2007), Beltsville ARS Technology Transfer Award (2008), and Phibro Animal Health Award (2011). Dr. Lillehoj was selected to receive 2014 Distinguished Veterinary Immunologist by the American Association of Veterinary Immunologist. Dr. Lillehoj was inducted into the ARS Hall of Fame in September 2014 and is the winner of 2015 Presidential Rank Award. In 2015, she has been selected as the winner of the American Service Medal for Career Achievement Award.