

INRA Research Topics

On the viruses

The H5N1 virus displays a large genetic plasticity; some strains are highly pathogenic while others are harmless in birds. Research into the interaction of each viral protein with the cytoplasmic and nuclear membranous components of target cells and of the host's immune system seeks to better understand the specificity of the virus and to identify appropriate vaccinal and therapeutic approaches. This research is conducted through a study of structures at the molecular scale to examine, for example, the viral M2 protein, the cellular surface proteins of avian hosts and their contacts with sialic acid receptors, as well as the network organization of hemagglutinin proteins.

On the hosts

If the entry mechanisms of viruses into host cells are beginning to be better understood, the interactions between the virus and the intracellular organelles still are not. In addition to the study of vulnerable bird species, the study of species with a natural immunity also is a source of knowledge : resistance to virus entry, resistance to intracytoplasmic transport, or blocking of virus excretion after replication within the cell.

On the vaccines

One research avenue on vaccines is the transport of influenza antigens by viral nanostructures or by Myxoma viruses, herpes viruses, or by canine adenoviruses. The success of this approach depends on several factors : the immune response to the selected influenza antigens and the effectiveness of the vector without undesirable side effects in the targeted host. Research into Orthomyxoviridae in fish may contribute to an understanding into delicate tissue and cellular immunity mechanisms.

On the dynamics of an epidemic

Within the framework of research undertaken in collaboration with several French organizations (INSERM, CIRAD, the Institut Pasteur and AFSSA), INRA is participating in the surveillance of sentinel species (man, domestic animals, wild animals) in Europe as in Asia and Africa, tackling the latter two continents in cooperation with CIRAD.

In 2006, eight INRA researchers are working full time on joint research units with CNRS, the French vet schools, and AFSSA.