



## Press release

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### **Novel Pestivirus Discovered in Sheep and Goats**

Closely related to classical swine fever virus.

In a cooperative project, scientists from the Institute of Virology at the University of Veterinary Medicine Hannover, Foundation (TiHo) have discovered a novel pestivirus species in small ruminants that is surprisingly closely related to the classical swine fever virus. In the current study, they were able to demonstrate that transmission of these viruses to pigs could have serious consequences for monitoring and control programs for classical swine fever. The scientists published their results in the journal *Emerging Infectious Diseases*.

The pestiviruses include numerous virus species relevant for veterinary medicine. These include, for instance, the border disease virus (BDV), which occurs in sheep and goats, the bovine viral diarrhea virus (BVDV-1, BVDV-2) and the classical swine fever virus (CSFV). Therefore, scientists at the TiHo Institute of Virology have been carrying out intensive research on the biology and evolution of these viruses for decades. As the reference laboratory of the European Union for classical swine fever, the institute has also collected all information on cases of CSFV in the EU since 1980. Each primary outbreak of classical swine fever in an EU member state is confirmed by an independent test at the TiHo Institute of Virology. In addition, along with four other institutions worldwide, the laboratory is a reference center for CSFV of the World Organization for Animal Health (OIE). This networking in the field of swine fever diagnostics and control at the European scale and beyond is an excellent opportunity to promote international cooperation, explains Professor Dr. Paul Becher, head of the institute and director of the EU & OIE reference laboratory.

Such cooperation resulted from a discovery made by scientists at Ankara University: in blood samples from herds of sheep and goats from different Turkish provinces, they found antibodies showing high reactivity with CSF viruses. This discovery worried us and made us curious at the same time, says Becher. This finding pointed to a possible infection of the animals with classical swine fever. Until now, the swine fever virus has been restricted to domestic pigs and wild boars. Pigs and goats infected with the CSF virus would have meant that the virus had spread to another species. However, suggesting an infection with the border disease virus, the clinical symptoms of the infected animals – fertility disorders, abortions, malformations and loss of function in the central nervous system in the offspring – spoke against this theory. Within the framework of their duties as the EU & OIE reference laboratory, TiHo virologists, together with the scientists from Ankara University, the University Hospital Hamburg-Eppendorf and the Heinrich Pette Institute, carried out a study to investigate the basis of this observation. The focus was a detailed characterization of the viruses.

Using molecular biological methods, the scientists decoded the complete genome of two virus isolates from the stocks concerned. By analyses of relationship, Professor Paul Becher and Dr. Alexander Postel of the TiHo Institute of Virology discovered that these viruses are representatives of a novel pestivirus species. The novel species is genetically similar to both the swine fever viruses and to the border disease viruses. Since the EU reference laboratory has an extensive collection of virus strains and defined immune sera, it was also possible to analyze the specificity of the serum antibodies against these viruses in detail. The surprising result: antibodies occurring after infection with the newly discovered pestiviruses are more similar to CSFV-specific antibodies than to antibodies occurring after infection with the border disease virus. For this reason, antibodies against these newly discovered viruses cannot be distinguished from those occurring after CSFV infection using common serological test methods. But precisely such serological tests are indispensable for CSFV monitoring programs and also for scientific monitoring of vaccination campaigns carried out in many countries. Transmission of such pestiviruses to pigs and their spread in domestic pigs and wild

boars would thus be a serious problem for the established CSFV control strategies.

Becher says: Initially, however, an all-clear can be given, since experimental infections of pigs provided no indications of effective virus propagation and excretion and also did not cause disease symptoms. Nevertheless, the TiHo scientists agree that, also because of the high mutation rate of these RNA viruses, these newly discovered viruses are potential candidates for a change of host.

They could then become a big problem, says Becher. Incidentally, it will take some time until the novel virus species has a name: the International Committee on Taxonomy of Viruses is responsible for the official naming of novel virus species and thus also for official recognition. This procedure normally takes one to two years.

## Original publication

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