AFRICAN SWINE FEVER PANDEMIC

Putting African swine fever on ice

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African swine fever (ASF) has a 100% fatality rate. Currently, the only means of containment is by culling infected animals — 30 million pigs were culled worldwide from 2018 to 2019. The virus presents with complex epidemiology, with transmission to domestic pigs via wild boar, ticks, farm workers and contaminated pig feed. The race to develop an antiviral treatment is intensifying, but vaccine development has been hindered by a lack of basic knowledge of the structure and function of the virus. Therefore, Sheng Liu and colleagues set out to characterize the molecular structure of the ASF virus protein shell (capsid), in order to identify potential targets for vaccine generation.

ASF virus was extracted from infected pig tissue and imaged using cryogenic electron microscopy (cryo-EM). Liu and co-authors then constructed a model of the ASF virus capsid, showing that at least three different minor proteins are needed to glue neighbouring capsomers together, thus ensuring that the viral genetic material is protected and entry into host cells is regulated. Just a few weeks before the publication of this study, a similar paper (Wang et al., *Science* **366**, 640–644; 2019) also reported the cryo-EM structure of the ASF virus. While the findings of both studies broadly correlate, data from Liu and colleagues suggest that a distinct minor protein is required in the zipper region of the capsid, which was not identified by Wang et al., that could provide a unique target for vaccine development. With the threat of ASF increasing daily, these findings provide a piece of the jigsaw puzzle to aid the development of a vaccine that would stabilize pork availability worldwide and halt the spread of this lethal virus.

Annisa Chand

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