A molecular clock dates the common ancestor of European-type porcine reproductive and respiratory syndrome virus at more than 10 years before the emergence of disease - DTU Orbit (21/12/2018)

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The disease caused by porcine reproductive and respiratory syndrome virus (PRRSV) emerged independently and almost simultaneously in Europe (1990) and North America (1987). The original reservoir of the virus and the date it entered the pig populations is not known. In this study, we demonstrate an accurate molecular clock for the European PRRSV ORF 3 gene, place the root in the genealogy, estimate the rate of nucleotide substitution, and date the most recent common viral ancestor of the data set to 1979; more than 10 years before the onset of the European epidemic. Based on these findings, we conclude that PRRSV virus most likely entered the pig population some time before the epidemic emergence of the virus, and hence, that emergence of European-type PRRSV is not the result of a recent species transmission event. Together, our results show that ORF3 sequencing is a valuable epidemiologic tool for examining the emergence and spread of PRRSV in Europe. As such, the panel of well-characterized and highly divergent ORF3 sequences described in this study provides a reference point for future molecular epidemiologic studies.