The aim of the project was to define the function of the African swine fever virus (ASFV)-encoded ubiquitin conjugating enzyme (UBCv1). Two alternative approaches were taken to construct recombinant ASFV in which either (i) a functional UBCv1 was not expressed, or (ii) the UBCv1 gene was controlled by an inducible promoter so that its expression could be regulated. It was anticipated that the regulated gene approach would produce viable recombinant viruses even if the UBCv1 gene was essential for infection. First, a replacement plasmid was made to delete the wild-type gene from the ASFV genome. Then, an inducible ASFV promoter containing the lac operator was cloned upstream of the UBCv1 gene and expression of UBCv1 was shown to be regulated by IPTG when co-transfected in infected cells with another plasmid expressing the lac repressor. Transfer plasmids were constructed to recombine this inducible UBCv1 gene with a second copy into a non-essential locus in the genome. None of these approaches produced viable recombinant viruses, suggesting that UBCv1 is an essential gene whose level and timing of expression are important for the viability of ASFV.

The possible significance of this is discussed.