Resistance to phages is an important property of dairy starter cultures. Thus, many different phage resistance systems have been isolated in Lactococci, most of them plasmid encoded. The Abi class of phage resistance leads to abortive infection, killing the infected cell but with no or very little release of new phages. AbiV, a chromosomally located Abi, giving resistance to the phage species 936 and C2, was recently isolated (1).

In the work to be presented Lactococcus lactis phage mutants insensitive to AbiV were isolated and analyzed in an effort to elucidate factors involved in the sensitivity to AbiV. Whole genome sequencing of two phage mutants in phage p2 revealed mutations in an early transcribed orf indicating that this orf was responsible for AbiV sensitivity. Sequencing of the homologous region in the genome of other AbiV insensitive mutants from phage p2 in addition to mutants derived from 6 other lactococcal wild-type phages of the 936 and C2 species, revealed point mutations in the same homologous orf. The orf was named sav (for sensitivity to AbiV) and the encoded polypeptide was named SaV. Overexpression of SaV in Lactococcus lactis and Escherichia coli led to a rapid toxic effect; furthermore, our results also indicate that SaV may be even more toxic in the presence of AbiV. A conserved region in SaV which is evolutionary related among different phage groups is likely responsible for the AbiV-sensitivity phenotype and the toxicity. Purification of a His-tagged SaV polypeptide by gel-filtration suggested that it formed a dimer in its native form.