Investigation of the Relationship between Lactococcal Host Cell Wall Polysaccharide Genotype and 936 Phage Receptor Binding Protein Phylogeny - DTU Orbit (16/01/2019)

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Comparative genomics of 11 lactococcal 936-type phages combined with host range analysis allowed subgrouping of these phage genomes, particularly with respect to their encoded receptor binding proteins. The so-called pellicle or cell wall polysaccharide of Lactococcus lactis, which has been implicated as a host receptor of (certain) 936-type phages, is specified by a large gene cluster, which, among different lactococcal strains, contains highly conserved regions as well as regions of diversity. The regions of diversity within this cluster on the genomes of lactococcal strains MG1363, SK11, IL1403, KF147, CV56, and UC509.9 were used for the development of a multiplex PCR system to identify the pellicle genotype of lactococcal strains used in this study. The resulting comparative analysis revealed an apparent correlation between the pellicle genotype of a given host strain and the host range of tested 936-type phages. Such a correlation would allow prediction of the intrinsic 936-type phage sensitivity of a particular lactococcal strain and substantiates the notion that the lactococcal pellicle polysaccharide represents the receptor for (certain) 936-type phages while also partially explaining the molecular reasons behind the observed narrow host range of such phages.

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