CARBOHYDRATE EPITOPE RECOGNIZED BY K99 FIMBRIAE FROM ENTEROPATHOGENIC *ESCHERICHIA COLI*

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Noninvasive enteropathogenic *Escherichia coli* strains possessing the K99 fimbrial antigen are known to often be isolated from neonatal calves, lambs, and piglets with diarrhea. The fimbriae are involved in the adherence of the bacteria to the host intestinal cells by specifically recognizing the carbohydrate residues of glycolipids and/or glycoproteins. In this report, the receptor carbohydrate structure was examined by the inhibition test (HI) of equine eryterocyte hemagglutination with some glycolipids, glycoproteins, and carbohydrates.

In HI using K99-positive organisms (strain B41) or K99 fimbrial crude fraction isolated from the same organisms, HI activities were detected by substances possessing N-glycolyl neuraminic acid (NeuGc) at the carbohydrate terminal, but no activity was detected in N-acetyl neuraminic acid-containing substances. NeuGcLacCer showed the highest HI activity among all substances used. The order of the inhibitory potency of the active compounds was as follows:

NeuGcLacCer > NeuGcnLc$_4$Cer > Bovine RBC major glycoprotein ≧ NeuGcnLc$_6$Cer > 4-0-Ac-NeuGcLacCer > NeuGcLac > NeuGc.

All compounds inhibited the hemagglutination with the fimbriae more sensitively than that with the bacterial cells. In NeuGcLacCer, it was 253 times more sensitive and in NeuGc monosaccharide, 2 times more sensitive, indicating that the isolated fimbriae recognize more precisely the structure of NeuGcLacCer than the fimbriae located on the bacterial cell wall. Eleven other *E. coli* strains isolated form calves and 2 strains from piglets, which possess the same K99 antigen and various O antigens, were used for HI. NeuGcLacCer, NeuGcnLc$_4$Cer, and the boving glycoprotein inhibited the hemagglutination with each strain, having a potency similar to that of strain B41, indicating that the carbohygrate epitope recognized by K99 fimbriae was not changed during natural mutations from strain to strain.