New antibacterial substance produced by *Escherichia coli* O104:H4

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Small plasmid pHUSEC41-3 (GenBank no. HE603112) (7,930 bp) identified in the enteroaggregative Shiga toxin-producing (stx2/vtx2-positive) serotype *E. coli* O104:H4 str. HUSEC41/01-09591 (isolated from a patient with diarrhoea and haemolytic uraemic syndrome in Germany in 2001) is quite often detected in *E. coli* strains isolated from human extraintestinal infections (8 *E. coli* strains from 100 tested) and from human gut microflora (3 *E. coli* strains from 114 tested) in South Moravia region of the Czech Republic. We have shown that pHUSEC41-3 code for a new, yet not identified, antibacterial substance which inhibits growth of tested indicator *E. coli* strains. Produced antibacterial substance has a narrow spectrum of activity and is not active against tested *Salmonella* and *Shigella* strains. Plasmid pHUSEC41-3 isolated from Czech human gut and extraintestinal *E. coli* strains was sequenced with 454 sequencing technology on GS Junior System and also with dideoxy termination sequencing. 74 nucleotides changes (51 substitutions and 23 indels) were identified in the plasmid backbone sequence. Transposon mutagenesis revealed ABC transporter genes and additional genes of unknown function, suggesting synthesis of novel antibacterial substance.