

Nucleotide sequences of 16S rRNA encoding genes from *Capnocytophaga ochracea* ATCC 33596, *Capnocytophaga sputigena* ATCC 33612 and *Capnocytophaga gingivalis* ATCC 33624

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Capnocytophaga (group DF-1) species (*C. ochracea*, *C. sputigena* and *C. gingivalis*) are thought to be associated with periodontal disease (1, 2). The clinically most important infections are seen in cases of localized juvenile periodontitis. Moreover, *Capnocytophaga* spp. are well-documented opportunistic pathogens, causing systemic infections primarily in granulocytopenic cancer patients with oral lesions (3).

Because of limitations of conventional methods for the sensitive detection and specific identification of these species in highly mixed samples such as subgingival plaque, the development of oligodeoxynucleotide probes directed against species-specifically conserved 16S rRNA target sequences may provide a more suitable tool.

For this reason the 16S rRNA encoding genes of *Capnocytophaga ochracea* ATCC 33596, *Capnocytophaga sputigena* ATCC 33612 and *Capnocytophaga gingivalis* ATCC 33624 were sequenced.

Amplification of the 16S rRNA gene was accomplished by PCR using universal primers designed from conserved regions of the 16S rRNA (4, 5). The amplicons were directly sequenced without cloning procedures by the dye terminator cycle-sequencing method using an ABI 373 A DNA-sequencer (Applied Biosystems, Weiterstadt, Germany). The PCR primers served also as sequencing primers. The results are shown in Figure 1 in an aligned form.

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C.o.: AGAGTTTGATCCGGCTCAAGATGACGCTTACGCCAGGGCTAACACATG -10
C.o.: -----A-----C-----*G-----A-----C----- -10
C.o.: -----A-----CC-----*GG-----A-----C----- -98
C.s.: CGTAACGGGTATAACAACTGGCTTACATGGGGATAGCCGAAAGAAATT -150
C.s.: -----A-----T-----*ATA-----C-----C----- -150
C.g.: -----A-----T-----*ATA-----C-----C----- -148
TGGATTAAATCCCGATAGATAATAGGAGGAGCGCATCTTT*TTATATTA -138
C.g.: -----A-----T-----*ATA-----C-----GA----- -138
C.g.: -----A-----T-----*T-----A-----GA----- -136
AGCTCTGGTGTGAAAGATGAGTATGGCTCTATTAGCTAGTGTGAGGAG -248
C.g.: -----AC-----G-----C-----C-----T----- -248
C.g.: -----A-----GC-----C-----C-----T----- -246
TAACGGCTCCCCAGGCTATGATAGATAGATAGGGGTCCTAGAGGGATGTCC -298
C.g.: -----A-----G-----C-----C-----GA----- -298
C.g.: -----A-----G-----C-----C-----GA----- -296
CCACACTGGTACTGAGATACGGACCGAACTCTACGGGGGCCAACATGA -349
C.g.: -----C-----G-----C-----C-----GA----- -349
C.g.: -----C-----G-----C-----C-----GA----- -346
GGAATATTGGACAAATGGTCGGAGACTYATTCAGCCCATGGCGGTGCGAG -398
C.g.: -----T-----A-----T-----A-----T----- -398
C.g.: -----T-----A-----T-----A-----T----- -396
ATAGCTGCCCTATGGGTGTTAAACTGCTTTATAGGGAGAAATAAGG -448
C.g.: -----A-----T-----A-----T----- -448
C.g.: -----A-----T-----A-----T----- -445
CTACCCATTCTTGTGACGACCTTACGAAATACACATTCACCTAACCTGCTCC -498
C.g.: -----G-----T-----CA-----A-----T----- -498
C.g.: -----G-----T-----CA-----A-----T----- -495
GTGCCAGACGGCGGCTTAACGGAGGATGGCGACGCGCTTATCCGAAATCA -548
C.g.: -----T-----A-----T----- -548
C.g.: -----T-----A-----T----- -545
TGGGTTAAAGGGTCCATGGCGGGCTTAATANGTCAGGGGAAAYCCTT -598
C.g.: -----T-----A-----T----- -598
C.g.: -----T-----A-----T----- -595
CACTCTAACACTGACACTCCTTAAACTGCTGCTGATGATGCTG -648
C.g.: -----T-----A-----T----- -648
C.g.: -----T-----A-----T----- -645
AAGTAGTGTGAAATGCTAGTGTAGCGGTGAAATGCTTACGATATACACAG -698
C.g.: -----T-----C-----A-----T----- -698
C.g.: -----T-----C-----A-----T----- -695
AACACCGGATGGCAAGGCAATATCAACATTAATGGCGCTGAYGAGC -748
C.g.: -----T-----A-----T----- -748
C.g.: -----T-----GGG-----G-----C-----A-----GA----- -745
GAAACCTTGGCGAACACAGCTTAACTGATACCCCGGTGACTCCAGCTGTA -798
C.g.: -----T-----A-----T----- -798
C.g.: -----T-----A-----T----- -795
AAGCTGGATGACTACGTCNGTGTGAGTAAATCTAGTGGCTAACCGAAAGTG -848
C.g.: -----C-----A-----T----- -848
C.g.: -----C-----A-----T----- -845
ATAAGTATCCCACCTGGGGATGACOCTTCCGCAAGATGAAACTCAAMGGAA -888
C.g.: -----CA-----T----- -888
C.g.: -----CA-----T----- -895
TTGACGGGGCCCCCACACAGCGCTGCGCATGTTTAAATCGGAGATA -948
C.g.: -----T-----A-----T----- -948
C.g.: -----T-----A-----T----- -945
CGCGAGGAACTTACCAAGGTTAAATGGGGCTGACAGAGGTGAGATA -998
C.g.: -----A-----T----- -998
C.g.: -----A-----T----- -995
TTTTCTTCGGACAGTTTCAAGGTCGTCAGGTTCTGCTAGCTGGT -1048
C.g.: -----CC-----A-----T----- -1048
C.g.: -----CC-----A-----T----- -1045
CCCCGAGGGTACGGTTAGCTTAAACGAGGCGAACCCCTGCCATT -1088
C.g.: -----T-----A-----T----- -1088
C.g.: -----T-----A-----T----- -1095
AGTTGCTTAACTGAGTGTGGCTGAGCCCTTAAATGGGACTCGCGGCGAAC -1148
C.g.: -----C-----A-----T----- -1148
C.g.: -----C-----A-----T----- -1145
CTGAGGAACTGGGAGTACGCTCAATCTACGCGCCCTAACATCTGG -1198
C.g.: -----A-----T----- -1198
C.g.: -----A-----T----- -1195
GCTACACACATGCTTCAATGGCGTACAGAGAGCAAGCCACTGGCTGAGC -1248
C.g.: -----T-----A-----T----- -1248
C.g.: -----T-----A-----T----- -1245
AGGCGGAACTCTATAAGACGCTCACAGTTCGGATCGGATCTGCAACTC -1298
C.g.: -----A-----T----- -1298
C.g.: -----A-----T----- -1295
GACTCCGTAAGGCTGAACTGCTGAACTGGGATATCGGATATCGGATGATCCG -1348
C.g.: -----A-----T----- -1348
C.g.: -----A-----T----- -1345
TGATAACCTCCGGGGCTTGTACACMCCCGCCCTCAACCAATGAGCT -1398
C.g.: -----A-----T----- -1398
C.g.: -----A-----T----- -1395
GGGGTACCTGAGGACCTTACCGCGAGGCTTACGGTAAACCTAG -1448
C.g.: -----C-----A-----T----- -1448
C.g.: -----C-----A-----T----- -1445
TGACTGGGCTAAGTCGTAACAAAGGTGCGTACCGGAAAGT -1490
C.g.: -----A-----T----- -1490
C.g.: -----A-----T----- -1487

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Figure 1. Sequences of 16S rRNA encoding genes from *Capnocytophaga ochracea* ATCC 33596 (C.o.), *Capnocytophaga sputigena* ATCC 33612 (C.s.) and *Capnocytophaga gingivalis* ATCC 33624 (C.g.) in an aligned form. Bars denote identical bases, asterisks indicate missing nucleotides at the given positions.