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박사학위 논문

Tryptic soy-serum-bacitracin-vancomycin 배지에서 배양된
Aggregatibacter actinomycetemcomitans 이외의 세균
동정

조선대학교 대학원

치의학과

조어진

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이 논문을 치의학 박사학위신청 논문으로 제출함

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ABSTRACT

Identification of non-*Aggregatibacter actinomycetemcomitans* bacteria grown on the tryptic soy-serum-bacitracin-vancomycin medium

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The aim of this study was to identify the non-*Aggregatibacter actinomycetemcomitans* bacteria grown on the tryptic soy-serum-bacitracin-vancomycin (TSBV) medium, an *A. actinomycetemcomitans* selective medium. A total of 82 unidentified bacterial isolates from the oral cavities of a Korean population were kindly provided by the Korean Collection for Oral Microbiology. All the clinical isolates were grown on TSBV medium and bacterial DNA purified from each isolate was subjected to PCR with universal primers specific for bacterial 16S rRNA genes (16S rDNAs) sequence. The each bacterial 16S rDNA was amplified by PCR and the nucleotide sequences of it was determined by the dideoxynucleotide chain termination method. They were identified by 16S rDNA sequence comparison method at the specie-level. In this study, we used 98.7% 16S rDNA gene sequence similarity as the threshold for differentiating two species. The data showed that *Neisseria* spp. (42 strains), *Fusobacterium* spp. (10 strains), *Capnocytophaga* spp. (8 strains), *Propionibacterium acnes* (5 strains), *Aggregatibacter aphrophilus* (4 strains), *Campylobacter* spp. (5 strains), *Veillonella dispar* (3 strains), *Streptococcus* sp. (1 strain),

Haemophilus parainfluenzae (1 strain), *Leptotrichia wadei* (1 strain), *Morococcus* sp./*Neisseria* sp. (1 strain), and *Staphylococcus* sp. (1 strain) were identified. These results could be used to develop a new *A. actinomycetemcomitans*-selective medium which is more effective than the TSBV medium in future studies.

I. 서 론

치주질환은 백악질, 치은, 치주인대 및 치조골 등으로 이루어진 치아 지지조직에 발생하는 염증성 질환으로 인류에서 가장 흔한 세균성 질환이다(Pihlstrom *et al.*, 2005). 치주질환은 진행 정도에 따라 치아의 부착조직에 영향을 미치지 않고 치은에 한정된 치은염과 치아 부착조직과 치조골의 파괴를 동반하는 치주염질환으로 분류된다(Armitage, 1999). 치주질환은 임상적으로 구취, 치은출혈, 통증, 부종, 치은퇴축, 치아 동요, 화농 등의 특징을 수반하고(Newman *et al.*, 2011), 치주질환이 지속될 경우 치근표면을 따라 골 파괴로 진행될 가능성이 있기 때문에, 치료되지 않은 채로 방치되면 급성 치주농양이나 치아소실로 이어진다(Darveau *et al.*, 2010). 그러므로 성인에 있어서 구강 내 치아상실을 초래하는 가장 중요한 원인 질환이다(Papapanou *et al.*, 1999).

치주질환의 원인 인자는 전신적 요인과 국소적 요인으로 구별할 수 있다. 전신적 요인으로는 유전, 호르몬, 영양, 흡연, 음주, 스트레스 및 면역기능 장애 등이 있는 것으로 알려져 있다(Amaliya *et al.*, 2007). 치주질환은 아테롬성 동맥경화증, 관상동맥 질환, 심근경색, 죽상동맥경화증, 저체중아 출산, 조산 및 유산, 당뇨병과 같은 대사증후군, 골다공증, 대장암, 알츠하이머 질환 등과 같은 전신질환과 연관성이 보고되고 있다(Offenbacher *et al.*, 2008; Haraszthy *et al.*, 2000; Abbayya *et al.*, 2015). 또한, 연령증가에 따른 유병률의 증가 경향을 보이며(Galgotra *et al.*, 2001; Hajishengallis *et al.*, 2014) 노인의 사망률과도 연관이 있는 것으로 보고되었다(Hamalainen *et al.*, 2005; Ajwani *et al.*, 2003).

국소적 요인으로 치은연하 치면세균막 내에 존재하는 세균들이 가장 큰 원인으로 작용한다(Marsh *et al.*, 1992). 치주질환은 정상인의 구강 안에 공생하는 정상 상재균들의 균형이 무너질 때 발생하는데(Wade *et al.*, 2013), 주로 치주질환 원인균에 존재하는 독성 인자들의 작용으로 인하여 치주조직이 파괴되어 발생한다(Haffajee *et al.*, 1994; Papapanou *et al.*, 1999). 사람의 구강에는 다양한 세균들이 700종 이상 존재하는데(Aas *et al.*, 2005; Paster *et al.*, 2006; Kolenbrander *et al.*, 2000), 치은연하 치면세균막의 경우 그람양성균과

그람음성 구균, 간균, 사상균으로 구성되며 나선균과 다양한 편모를 가진 세균들이 치면세균막의 성장을 이끌어 간다(Schroeder *et al.*, 1970; Listgarten *et al.*, 1976). 치면세균막은 수많은 세균들이 모인 세균의 집합체로(Sbordone *et al.*, 2003) 치주질환의 경우 대부분 치은연하 치면세균막에 서식하는 *Treponema denticola*, *Porphyromonas gingivalis*, *Tannerella forsythia*, *Prevotella intermedia*, *Fusobacterium nucleatum* 및 *Aggregatibacter actinomycetemcomitans* (= *Actinobacillus actinomycetemcomitans*)등의 그람 음성 혐기성세균들이 주요한 원인균으로 보고되고 있다(Paster *et al.*, 2001; Marsh, 1992; Darveau *et al.*, 1997; Haffajee *et al.*, 2000; Slots, 1979).

*A. actinomycetemcomitans*는 그람음성 비운동성 간균으로 미호기성(microaerophilic) 세균으로 알려져 있다(Topley *et al.*, 1929; Newman *et al.*, 1976; Potts *et al.*, 1985; Henderson *et al.*, 2010). *A. actinomycetemcomitans*는 구강에 존재하는 정상 상재균으로 흔히 치주질환의 발생과 관련된 유독성의 치주조직 병원체로 알려져 있다(Asikainen *et al.*, 1999; Fine *et al.*, 2000).

*A. actinomycetemcomitans*는 국소 유년형 치주염(localized juvenile periodontitis, 현재 국소 급진성 치주염, localized aggressive periodontitis)의 주요한 원인균으로 보고되어(Mandell *et al.*, 1984.), 특정 치주질환의 원인균으로 처음 보고된 균종이다. 또한 성인의 재발성 치주염(Zambon *et al.*, 1983) 및 성인의 급성 치주질환(Eisenmann *et al.*, 1983, Ebersole *et al.*, 1982)과의 밀접한 관련성이 보고되었다. *A. actinomycetemcomitans*는 구강질환 외에도 뇌농양(Rahamat *et al.*, 2011; Ahmed *et al.*, 2010), 폐감염(Meyers *et al.*, 1971), 심내막염(Kristinsson *et al.*, 1988; Pierce *et al.*, 1984; Grace *et al.*, 1988), 울혈성 심부전(Van Winkelhoff *et al.*, 1999) 및 방광염, 요도염과 같은 비구강 감염에서도 검출되었다(Townsend *et al.*, 1969).

*A. actinomycetemcomitans*의 대표적인 외독소는 백혈구와 단핵 세포의 세포자살을 유도해서 세포를 사멸시키는 leukotoxin(Johansson *et al.*, 2012, Taichman *et al.*, 1981, Narayanan *et al.*, 2002)이 있으며, leukotoxin의 농도

는 국소적 급진성 치주염의 정도와 연관이 있는 것으로 보고되었다(Dirienzo *et al.*, 1994). 내독소인 지질다당류(Yamaguchi *et al.*, 2007)는 숙주 세포 주기(host-cell cycle)의 진행을 방해하는 이열성 치사 팽창 독소(Cytolytic distending toxin; CDT)를 생산하여 파골세포를 형성함으로써 뼈 흡수를 야기하므로 병원성이 높은 것으로 보고되었다(Tanaka *et al.*, 2007; Bendre *et al.*, 2003).

*A. actinomycetemcomitans*의 세균-숙주 상호작용 연구 등의 병인론 연구를 위해서는 사람의 구강에서 분리 및 동정하는 것이 필요하다. 이를 위해 *A. actinomycetemcomitans*를 선택적으로 분리하기 위한 배지로 malachite green-bacitracin (MGB) 배지(Mandell *et al.*, 1981), TSBV (tryptic soy-serum-bacitracin-vancomycin) 배지(Slots, 1982), Dentaid-1 배지(brain-heart infusion agar에 0.5% yeast extract, 0.15% sodium fumarate, 0.1% sodium formate 및 9 µg/ml vancomycin 첨가)(Alsina *et al.*, 2001) 및 *A. actinomycetemcomitans* selective medium (AASM)(Tsuzukibashi *et al.*, 2008) 등이 개발되어 알려져 있다. 그 중에서도 tryptic soy agar elective 배지에 horse serum, yeast, bacitracin 그리고 vancomycin이 추가된 TSBV 배지가 *A. actinomycetemcomitans*의 성장과 분리를 위한 선택배지로 두 번째로 보고되었지만(Slots, 1982), TSBV 배지는 새로운 *A. actinomycetemcomitans* 선택배지 개발에 있어서 대조군으로 가장 많이 사용되었다(Alsina *et al.*, 2001; Tsuzukibashi *et al.*, 2008). 또한, TSBV 배지에는 말 혈청 성분이 포함되어 있고, 이 배지에서 성장하는 *A. actinomycetemcomitans* 콜로니 중심부에는 특징적인 별모양이 있어 쉽게 구별할 수 있는 장점이 있다(Henderson *et al.*, 2010; Tsuzukibashi *et al.*, 2008). 하지만 본 실험에서와 같이 TSBV 배지에서도 *A. actinomycetemcomitans* 이외의 여러 균종들이 자라나고, *A. actinomycetemcomitans*의 분리율은 매우 작았으며, 어떤 균종들이 자라는 지에 대한 연구는 미미하다. 그러므로 본 연구는 TSBV 배지에서 자라나는 *A. actinomycetemcomitans* 이외의 균주들을 16S rRNA 유전자(16S rDNA) 핵산염기서열 비교분석법을 이용하여 종 수준에서 동정하기 위해 시행하였다.

II. 연구재료 및 방법

1. 세균 및 세균배양

본 연구에 이용된 균주들은 TSBV 배지에서 분리되었지만, 종 수준으로 동정이 되지 않은 것으로 한국구강미생물자원은행(KCOM, Korean Collection for Oral Microbiology, Gwangju, Korea)에서 분양받아 사용하였다(Table 1). 이들 균주들은 한국인의 치은염 부위, 치주염 부위 그리고 임플란트 주위염의 치은연하 치면세균막을 비롯해 치주질환이 발생하지 않은 사람의 치은연하 치면세균막과 혀 부위에서 분리된 것들 이었다.

모든 균주들은 TSBV (tryptic soy-serum-bacitracin-vancomycin) 한천배지 (40% tryptic soy agar, 1% yeast extract, 10% horse serum, 75 µg/ml bacitracin 및 5 µg/ml vancomycin)에 도말하여 혼기성 (N_2 , 5% CO_2 , 5% H_2) 조건이 제공된 37°C 혼기성 세균배양기(Bactron I, Sheldon Manufacturing Inc., Cornelius, OR, USA)에서 24-48시간 동안 배양하여 사용하였다. 최적 성장 조건을 조사하는 실험에서는 tryptic soy broth (TSB, BD Difco Laboratories, Spark, MD, USA)에 0.5% yeast extract, 0.05% cysteine HCl-H₂O, 0.5 mg/ml of hemin 및 2 mg/ml of vitamin K₁가 함유된 TSB-YCHV_K 배지 또는 2.0% Trypticase peptone (BD Difco Laboratories), 0.25% K₂HPO₄, 0.25% dextrose, 0.5% yeast extract, 5 µg/ml of hemin, 0.05% cysteine HCl-H₂O, 및 2 µg/ml of vitamin K₁로 구성된 TP-YCHV_K 배지를 사용하였다.

2. 16S rDNA 클로닝

본 연구에 사용된 균주들의 종 수준에서 동정은 16S rRNA 유전자(16S rDNA) 핵산염기서열 비교분석법을 이용하여 시행하였다. 균주들의 16S rDNA를 중합효소연쇄반응 증폭을 위해서 27F (5'-AGA GTT TGA TCM TGG CTC AG-3')와 1492R (5'-TAC GGY TAC CTT GTT ACG ACT T-3') 프라이머들(Lane *et al.*, 1985)을 사용하였다. 중합효소연쇄반응은 94°C에서 2분간 전변성(predenaturation)을 실시하고 94°C에서 1분간 변성(denaturation), 55°C에서 30초간 결합(annealing), 7

2°C에서 1분간 중합(extension) 과정을 30회 반복하여 시행하고, 마지막 중합과정은 72°C에서 10분간 시행하였다. 최종 중합효소연쇄반응 용액 중 2㎕씩을 채취하여 1.5% 아가로스 젤에서 전기영동을 실시하여 중합효소연쇄반응 산물의 증폭 여부를 확인하였다. 중합효소연쇄반응 증폭물은 AccuPrep® PCR Purification Kit (Bioneer Co., Daejeon, Korea)를 이용하여 정제하였고, pGEM-T easy vector (Promega Co., Madison, WI, USA)에 제조회사의 지시에 따라 결합(ligation)시키고, 이를 *E. coli* DH5 α 에 형질전환 하여 16S rDNA를 함유한 재조합 플라스미드로 형질전환된 균주를 얻었다. 재조합 플라스미드는 AccuPrep® Plasmid Extraction Kit (Bioneer Co.)를 이용하여 제조회사의 지시대로 추출하였다.

3. 16S rDNA 핵산염기서열 결정 및 상동성 검색

재조합 플라스미드에 함유된 각 균주에서 클로닝한 16S rDNA의 핵산염기서열의 결정은 ChDC-GEM-F (5'-TTC CCA GTC ACG ACG TTG TAA AA-3')와 ChDC-GEM-R (5'-GTG TGG AAT TGT GAG CGG ATA AC-3') 프라이머들을 이용하여 dideoxynucleotide chain termination 법을 이용하여 바이오니아 사(Korea)에 의뢰하여 시행하였다.

각 균주들의 16S rDNA 핵산염기서열들은 EzTaxon 프로그램(<http://www.ezbiocloud.net/eztaxon>)을 이용하여 상동성 검색을 하였고, 그 결과 98.7% 이상의 상동성을 보이는 표준균주와 같은 종으로 판정하였다. 각 균주의 16S rDNA 핵산염기서열과 98.7% 이상의 상동성을 보이는 세균 종이 2개 이상인 경우 종-수준으로의 판정은 보류하였다. 16S rDNA 핵산염기서열과 상동성이 기준의 세균 종들의 표준균주의 것과 98% 이하인 균주들은 신균종이라 판정하였다.

4. 계통발생 분석

새로운 균종이라 생각되는 균주들 및 그들과 가장 가까운 속(genus)에 속하는 균종 표준균주들의 16S rDNA 핵산염기서열을 MEGA version 6 (Tamura *et al.*, 2011) 프로그램을 이용하여 Clustal W 법으로 정렬(alignment)하였으며, neighbor-joining methods (Saitou and Nei, 1987)을 이용하여 계통도

(phylogenetic tree)를 작성하였다. 이때 계통도의 신뢰도를 확인할 수 있는 bootstrap 값은 1,000회의 resampled data로부터 계산하였다. 이를 균주들의 진화적 거리(% distance로 표현함)는 Kimura 2-parameter model을 이용하여 계산하였다.

5. 신종 가능성 균주들의 최적성장조건 결정

본 연구에서 새로운 균종이라 생각되는 균주들의 특성을 밝히기 위한 실험의 일환으로 온도, 수소이온농도(pH) 및 염화나트륨(NaCl) 농도에 따른 최적 성장 조건을 결정하였다.

최적 성장 온도를 조사하기 위해 5–60°C (5°C 간격) 조건에서 24 hr, 48 hr 및 72 hr 동안 배양하여 Epoch Microplate Spectrophotometer (Biotek, Winooski, VT, USA)와 Gen5™ Program (Biotek)을 이용하여 각각 UV 600 nm 파장에서 OD 값(Optical Density)을 측정하였다. 이때 TSB-YCHVk 배지(pH 7.0)를 사용하여 배양하였다.

수소이온농도는 pH 3.5–9 (pH 0.5 간격) 조건에서 24 hr, 48 hr 및 72 hr 동안 배양하여 측정하였고, 이때 TSB-YCHVk 배지를 HCl 또는 NaOH를 이용하여 pH를 적정하여 사용하였다.

NaCl 농도의 경우는 0, 1, 2, 3, 4, 6, 8, 10, 12% 농도에서 24 hr, 48 hr 및 72 hr 동안 배양하여 측정하였다. 이 때 TP-YCHVk 배지에 각각의 조건에 맞게 NaCl을 첨가하여 세균 배양을 하였다.

위의 3가지 조건에 맞는 최적 성장 조건 실험은 2번 반복 실험하였다.

Table 1. Bacterial strains isolated from patients

Patients' No.	Source	Strains
PD 1	Subgingival dental plaque (normal)	KCOM 2171 (ChDC A1)
YB 1	Subgingival dental plaque (gingivitis)	KCOM 2172 (ChDC A2), KCOM 2647 (ChDC PV-A89), KCOM 2659 (ChDC PV-A101)
YB 2	Periimplantitis	KCOM 2668 (ChDC PV-A122)
		KCOM 2177 (ChDC A7), KCOM 2178 (ChDC A8),
	Subgingival dental plaque (gingivitis)	KCOM 2179 (ChDC A9), KCOM 2186 (ChDC A16), KCOM 2187 (ChDC A17), KCOM 2188 (ChDC A18)
YB 4		KCOM 2191 (ChDC A21), KCOM 2915 (ChDC A7-2)
	Tongue	KCOM 2651 (ChDC PV-A93), KCOM 2652 (ChDC PV-A94), KCOM 2653 (ChDC PV-A95), KCOM 2660 (ChDC PV-A102), KCOM 2661 (ChDC PV-A103)
YB 5	Tongue	KCOM 2600 (ChDC PV-A42), KCOM 2601 (ChDC PV-A43), KCOM 2602 (ChDC PV-A44)
YB 10	Subgingival dental plaque (gingivitis)	KCOM 2663 (ChDC PV-A105), KCOM 2664 (ChDC PV-A106)
YB 13	Tongue	KCOM 2604 (ChDC PV-A46), KCOM 2605 (ChDC PV-A47)
YB 14	Tongue	KCOM 2606 (ChDC PV-A48), KCOM 2607 (ChDC PV-A49)
YB 15	Tongue	KCOM 2609 (ChDC PV-A51), KCOM 2610 (ChDC PV-A52), KCOM 2639 (ChDC PV-A81), KCOM 2655 (ChDC PV-A97), KCOM 2656 (ChDC PV-A98)
YB 16	Subgingival plaque (gingivitis)	KCOM 2611 (ChDC PV-A53), KCOM 2612 (ChDC PV-A54)
YB 17	Tongue	KCOM 2618 (ChDC PV-A60)
YB 18	Tongue	KCOM 2620 (ChDC PV-A62)

KCOM, Korean Collection for Oral Microbiology

ChDC, Department of Oral Biochemistry, College of Dentistry, Chosun University
(continued on next page)

Table 1. (continued)

Patients' No.	Source	Strains
YB 19	Subgingival dental plaque (gingivitis)	KCOM 2566 (ChDC PV-A8), KCOM 2642 (ChDC PV-A84), KCOM 2657 (ChDC PV-A99)
	Tongue	KCOM 2623 (ChDC PV-A65), KCOM 2624 (ChDC PV-A66), KCOM 2625 (ChDC PV-A67)
YB 20	Subgingival plaque (gingivitis)	KCOM 2567 (ChDC PV-A9), KCOM 2568 (ChDC PV-A10) KCOM 2569 (ChDC PV-A11), KCOM 2570 (ChDC PV-A12) KCOM 2571 (ChDC PV-A13), KCOM 2626 (ChDC PV-A68), KCOM 2627 (ChDC PV-A69), KCOM 2628 (ChDC PV-A70)
	Subgingival dental plaque (gingivitis)	KCOM 2572 (ChDC PV-A14), KCOM 2573 (ChDC PV-A15), KCOM 2574 (ChDC PV-A16), KCOM 2575 (ChDC PV-A17), KCOM 2576 (ChDC PV-A18), KCOM 2577 (ChDC PV-A19), KCOM 2578 (ChDC PV-A20), KCOM 2579 (ChDC PV-A21), KCOM 2580 (ChDC PV-A22), KCOM 2581 (ChDC PV-A23), KCOM 2582 (ChDC PV-A24), KCOM 2583 (ChDC PV-A25), KCOM 2584 (ChDC PV-A26), KCOM 2585 (ChDC PV-A27), KCOM 2586 (ChDC PV-A28)
YB 21	Subgingival dental plaque (periodontitis)	KCOM 2587 (ChDC PV-A29), KCOM 2588 (ChDC PV-A30), KCOM 2589 (ChDC PV-A31)
	Tongue	KCOM 2629 (ChDC PV-A71), KCOM 2645 (ChDC PV-A87)
YB 22	Subgingival dental plaque (gingivitis)	KCOM 2590 (ChDC PV-A32), KCOM 2591 (ChDC PV-A33), KCOM 2594 (ChDC PV-A36), KCOM 2595 (ChDC PV-A37), KCOM 2596 (ChDC PV-A38), KCOM 2597 (ChDC PV-A39), KCOM 2598 (ChDC PV-A40), KCOM 2630 (ChDC PV-A72) KCOM 2646 (ChDC PV-A88)
	Tongue	KCOM 2635 (ChDC PV-A77), KCOM 2636 (ChDC PV-A78), KCOM 2637 (ChDC PV-A79)

KCOM, Korean Collection for Oral Microbiology

ChDC, Department of Oral Biochemistry, College of Dentistry, Chosun University

III. 연구 결과

1. 구강 병소에서 분리된 세균 동정

본 연구에서 사용된 균주들의 16S rDNA 핵산염기서열을 결정하기 위하여 (Supplementary Table 1~82) EzTaxon 프로그램 (<http://www.ezbiocloud.net/eztaxon>)을 이용하여 상동성을 검색한 결과 가장 높은 상동성을 보이는 세균 종의 표준균주와의 상동성을 Table 2에 정리하였다. 본 연구에서 사용된 균주들의 16S rDNA 핵산염기서열과 98.7% 이상의 상동성을 보이는 표준균주가 2개 이상일 경우 종-수준으로의 동정은 보류하고, 속(genus) 수준으로만 동정을 하였다(Table 3). 그 결과 13개 세균 종(*Aggregatibacter aphrophilus*, *Campylobacter gracilis*, *Campylobacter rectus*, *Campylobacter showae*, *Capnocytophaga ochracea*, *Fusobacterium nucleatum*, *Fusobacterium periodonticum*, *Haemophilus parainfluenzae*, *Leptotrichia wadei*, *Neisseria flava*, *Neisseria subflava*, *Propionibacterium acnes*, *Veillonella dispar*)과 종-수준으로 동정이 안 된 4~5개 속(*Capnocytophaga* sp., *Neisseria* sp., *Neisseria* sp./*Morococcus* sp., *Staphylococcus* sp., *Streptococcus* sp.)에 속하는 균주들이 TSBV 배지에서 자라는 것으로 확인하였다.

기존의 표준균주들과 16S rDNA 핵산염기서열 상동성이 98.7% 이하인 균주들 중에는 *Capnocytophaga* spp. 7 균주와 *Neisseria* sp. 1 균주가 존재하였다 (Table 3).

같은 환자에서 분리된 세균 중 같은 종에 속하는 균주들은 Table 4에 정리하였다. 그 결과 11명의 환자에서 분리된 균주들 중에는 같은 종에 속하는 균주들이 2개 이상 존재하였다. 이들 균주들은 대부분 *Neisseria* spp.에 속하였다.

2. 동정된 세균들의 계통발생 분석

본 연구에서 82개 균주를 동정한 결과 표준균주와의 상동성이 98.7% 이하인 균주들의 종 수준으로의 동정을 위하여 계통발생 분석(Phylogenetic analysis)을 시행하였다. 신균종 가능성이 있을 것으로 예상되는 균주는 *Capnocytophaga*

속으로 분류된 KCOM 2191, KCOM 2575, KCOM 2583, KCOM 2589, KCOM 2590, KCOM 2595, KCOM 2668의 7개 균주였다(Table 2 및 Fig. 1) 이들 중 한 환자에서 분리된 KCOM 2595와 KCOM 2590는 상동성이 99.7%여서 같은 균주라 생각된다(data not shown). 또한, 같은 환자에서 분리된 KCOM 2583, KCOM 2575, KCOM 2589 및 KCOM 2577 중에서 KCOM 2583과 KCOM 2575도 99.7% 상동성을 보여 같은 균주라 생각되고, 이들과 두 균주들인 KCOM 2589과 KCOM 2577 (*C. orhracea*)들과 각각 약 98.7% 상동성을 보여 다른 *Capnocytophaga* 종일 가능성이 높은 것으로 생각된다.

3. 신종가능성 균주들의 최적성장조건 결정

본 연구에서 신균종 가능성이 있는 7개 균주 중에서 검출 대상이 중복되지 않도록 한 명의 환자에서 한 균주만을 선별하고, 그 가능성이 애매한 균주를 제외하여 최종적으로 KCOM 2191, KCOM 2595 및 KCOM 2668 3균주를 신종 가능성이 있는 균주로 선정하였다. 이들 균주들의 신종으로 확립하기 위한 실험 중 하나인 최적성장조건(온도, pH 및 NaCl 농도)을 3일 동안(24hr, 48hr, 72hr) 2회 반복하여 배양 및 측정하였다. 그 결과 세 균주들은 30~40°C의 범위 내에서 최적의 성장을 보였다(Fig. 2-4 및 Table 5). NaCl 농도에 따른 성장 결과 세 균주 모두 NaCl이 없는 조건에서 잘 자랐으며, KCOM 2191은 NaCl 1% 농도에서도 최상의 성장을 하였다(Fig. 2-4 및 Table 5). KCOM 2191과 KCOM 2595 균주들이 pH 6.5~9.0의 범위에서 최적의 성장을 보인 반면, KCOM 2668은 pH 4.5~6.0 사이에서 최적의 성장을 보였다(Fig. 2-4 및 Table 5).

Table 2. Identification of clinical isolates by nucleotide sequence of 16S rDNA

KCOM No.	Genus or species match [GenBank Accession No.]	Similarity (%)
KCOM 2171	<i>Aggregatibacter aphrophilus</i> ATCC 33389 ^T [AEWB01000034]	98.97
	<i>Neisseria flava</i> U40 [AJ239301]	99.7
KCOM 2172	<i>Nesseeeria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.66
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.96
KCOM 2647	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.63
	<i>Neisseria flava</i> U40 [AJ239301]	99.7
KCOM 2659	<i>Nesseeeria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.66
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.59
KCOM 2668	<i>Capnocytophaga ochracea</i> DSM 7271 ^T	96.72
	<i>Streptococcus salivarius</i> subsp. <i>salivarius</i> NCTC 8618 ^T [CP009913]	99.8
KCOM 2177	<i>Streptococcus vestibularis</i> ATCC49124 ^T [GL831116]	99.66
	<i>Streptococcus salivarius</i> subsp. <i>thermophilus</i> ATCC19258 ^T [AY188354]	99.52
	<i>Neisseria flava</i> U40 [AJ239301]	99.85
KCOM 2178	<i>Neisseria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.79
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.73
	<i>Neisseria flava</i> U40 [AJ239301]	99.85
KCOM 2179	<i>Neisseria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.79
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.73
	<i>Morococcus cerebrosus</i> CIP 81.93 ^T [JUFZ01000072]	99.79
KCOM 2186	<i>Neisseria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.66
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.66
	<i>Neisseria flava</i> U40 [AJ239301] [AJ239301]	99.63
	<i>Neisseria flava</i> U40 [AJ239301] [AJ239301]	99.7
KCOM 2187	<i>Neisseria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.66
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.59

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Table 2. (continued)

KCOM No.	Genus or species match [GenBank Accession No.]	Similarity(%)
	<i>Neisseria flava</i> U40 [AJ239301] [AJ239301]	99.78
KCOM 2188	<i>Neisseria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.73
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.66
KCOM 2191	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	97.57
KCOM 2915	<i>Staphylococcus warneri</i> ATCC 27836 ^T [L37603]	99.86
	<i>Staphylococcus pasteuri</i> ATCC 51129 ^T [AF041361]	99.36
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.78
KCOM 2651	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.7
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.59
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.11
	<i>Veillonella dispar</i> ATCC 17748 ^T [ACIK02000021]	99.8
KCOM 2652	<i>Veillonella parvula</i> DSM 2008 ^T [CP001820]	98.99
	<i>Veillonella tobetsuensis</i> B16 ^T [AB679109]	98.92
	<i>Veillonella dentifaricosa</i> RBV106 ^T [EF185167]	98.92
KCOM 2653	<i>Fusobacterium periodonticum</i> ATCC 33693 ^T [ACJY01000002]	99.93
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.63
KCOM 2660	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.56
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.45
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	98.97
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.7
KCOM 2661	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.63
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.52
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.04
KCOM 2600	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.85
	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	98.82
KCOM 2601	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.93
KCOM 2602	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.85
KCOM 2663	<i>Neisseria flava</i> U40 [AJ239301]	99.85
KCOM 2664	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2604	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.63

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Table 2. (continued)

KCOM No.	Genus or species match [GenBank Accession No.]	Similarity(%)
KCOM 2605	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.78
KCOM 2606	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.7
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.52
KCOM 2607	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.11
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.63
KCOM 2608	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.56
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.45
KCOM 2609	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.56
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2639	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.56
KCOM 2655	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2656	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2611	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.63
KCOM 2612	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2618	<i>Veillonella dispar</i> ATCC 17748 ^T [ACIK02000021]	99.8
KCOM 2620	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.93
KCOM 2566	<i>Neisseria sicca</i> ATCC 29256 ^T [ACK002000016]	99
	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99
KCOM 2642	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.85
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.63
KCOM 2657	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.24
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	98.97
KCOM 2623	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.93
	<i>Neisseria perflava</i> U15 ^T [AJ239295]	99.7
KCOM 2623	<i>Neisseria mucosa</i> M5 ^T [AJ239279]	99.63
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.52

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Table 2. (continued)

KCOM No.	Genus or species match [GenBank Accession No.]	Similarity(%)
KCOM 2624	<i>Nesseria mucosa</i> M5 ^T [AJ239279]	99.7
	<i>Nesseria perflava</i> U15 ^T [AJ239295]	99.48
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.03
KCOM 2625	<i>Neisseria subflava</i> U37 ^T [AJ239291]	98.82
	<i>Nesseria mucosa</i> M5 ^T [AJ239279]	99.93
	<i>Nesseria perflava</i> U15 ^T [AJ239295]	99.7
	<i>Neisseria flavescens</i> ATCC 13120 ^T [L06168]	99.31
	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.04
KCOM 2567	<i>Aggregatibacter aphrophilus</i> ATCC 33389 ^T [AEWB01000034]	99.79
KCOM 2568	<i>Aggregatibacter aphrophilus</i> ATCC 33389 ^T [AEWB01000034]	100
KCOM 2569	<i>Campylobacter gracilis</i> ATCC 33236 ^T [DQ174168]	99.55
KCOM 2570	<i>Aggregatibacter aphrophilus</i> ATCC 33389 ^T [AEWB01000034]	99.93
KCOM 2571	<i>Campylobacter rectus</i> ATCC 33238 ^T [L04317]	99.57
KCOM 2626	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2627	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.78
	<i>Neisseria flava</i> U40 [AJ239301]	99.93
KCOM 2628	<i>Nesseeeria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.79
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.73
KCOM 2572	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.32
KCOM 2573	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.47
	<i>Neisseria flava</i> U40 [AJ239301]	99.93
KCOM 2574	<i>Nesseeeria macacae</i> ATCC 33926 ^T [AFQE01000146]	99.86
	<i>Nesseeeria sicca</i> ATCC 29256 ^T [ACK002000016]	99.79
KCOM 2575	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	97.5
KCOM 2576	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.16
KCOM 2577	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	98.82
KCOM 2578	<i>Propionibacterium acnes</i> DSM 1897 ^T [AWZZ01000008]	99.93
KCOM 2579	<i>Campylobacter gracilis</i> ATCC 33236 ^T [DQ174168]	99.55

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Table 2. (continued)

KCOM No.	Genus or species match [GenBank Accession No.]	Similarity(%)
KCOM 2580	<i>Propionibacterium acnes</i> DSM 1897 ^T [AWZZ01000008]	99.79
KCOM 2581	<i>Campylobacter rectus</i> ATCC 33238 ^T [L04317]	99
KCOM 2582	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.39
KCOM 2583	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	97.61
KCOM 2584	<i>Propionibacterium acnes</i> DSM 1897 ^T [AWZZ01000008]	99.86
KCOM 2585	<i>Leptotrichia wadiei</i> LB16 ^T [AY029802]	99.09
KCOM 2586	<i>Propionibacterium acnes</i> DSM 1897 ^T [AWZZ01000008]	99.86
KCOM 2587	<i>Campylobacter showae</i> CCUG 30254 ^T [DQ174155]	99.78
KCOM 2588	<i>Propionibacterium acnes</i> DSM 1897 ^T [AWZZ01000008]	99.79
KCOM 2589	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	98.12
KCOM 2629	<i>Haemophilus parainfluenzae</i> ATCC 33392 ^T [GL872342]	99.25
KCOM 2645	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.56
KCOM 2590	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	97.22
KCOM 2591	<i>Fusobacterium nucleatum</i> subsp. <i>vincentii</i> ATCC 49256 ^T [AABF01000026]	98.67
KCOM 2594	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.47
KCOM 2595	<i>Capnocytophaga ochracea</i> DSM 7271 ^T [ABTH01000001]	97.15
KCOM 2596	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.47
KCOM 2597	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.24
KCOM 2598	<i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> ATCC 10953 ^T [X55402]	99.24
KCOM 2630	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.63
KCOM 2646	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.63
KCOM 2635	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7
KCOM 2636	<i>Veillonella dispar</i> ATCC 17748 ^T [ACIK02000021]	99.87
KCOM 2637	<i>Neisseria subflava</i> U37 ^T [AJ239291]	99.7

KCOM, Korean Collection for Oral Microbiology.

Table 3. The summary of the identification of the bacteria which were isolated from TSBV medium in this study

Genus and species	No.	strains
<i>Aggregatibacter aphrophilus</i>	4	KCOM 2171, KCOM 2567, KCOM 2568, KCOM 2570
<i>Campylobacter gracilis</i>	2	KCOM 2569, KCOM 2579
<i>Campylobacter rectus</i>	2	KCOM 2571, KCOM 2581
<i>Campylobacter showae</i>	1	KCOM 2587
<i>Capnocytophaga ochracea</i>	1	KCOM 2577
<i>Capnocytophaga</i> sp.	7	KCOM 2191*, KCOM 2668*, KCOM 2575*, KCOM 2583*, KCOM 2589*, KCOM 2590*, KCOM 2595*
<i>Fusobacterium nucleatum</i>	9	KCOM 2576, KCOM 2597, KCOM 2598, KCOM 2572, KCOM 2573, KCOM 2582, KCOM 2591, KCOM 2594, KCOM 2596
<i>Fusobacterium periodonticum</i>	1	KCOM 2653
<i>Haemophilus parainfluenzae</i>	1	KCOM 2629
<i>Leptotrichia wadiei</i>	1	KCOM 2585
<i>Neisseria flava</i>	1	KCOM 2663
<i>Neisseria</i> sp.	19	KCOM 2178, KCOM 2179, KCOM 2187, KCOM 2188, KCOM 2651, KCOM 2660, KCOM 2661, KCOM 2606, KCOM 2607, KCOM 2624, KCOM 2625, KCOM 2628, KCOM 2574, KCOM 2172, KCOM 2659
<i>Neisseria</i> sp. / <i>Morococcus</i> sp.	1	KCOM 2186
<i>Neisseria subflava</i>	22	KCOM 2600, KCOM 2601, KCOM 2602, KCOM 2664, KCOM 2604, KCOM 2605, KCOM 2609, KCOM 2610, KCOM 2639, KCOM 2655, KCOM 2656, KCOM 2611, KCOM 2612, KCOM 2620, KCOM 2626, KCOM 2627, KCOM 2645, KCOM 2630, KCOM 2646, KCOM 2635, KCOM 2637, KCOM 2647
<i>Propionibacterium acnes</i>	5	KCOM 2578, KCOM 2580, KCOM 2584, KCOM 2586, KCOM 2588
<i>Staphylococcus</i> sp.	1	KCOM 2915
<i>Streptococcus</i> sp.	1	KCOM 2177
<i>Veillonella dispar</i>	3	KCOM 2652, KCOM 2618, KCOM 2636
Total	82	

KCOM, Korean Collection for Oral Microbiology.

*, Candidate of new species.

Table 4. The summary of the bacterial strains of same species isolated from same patients

Patients' No.	Species (strains)
YB 1	<i>Neisseria</i> sp. (KCOM 2172, KCOM 2659)
YB 4	<i>Neisseria</i> sp. (KCOM 2178, KCOM 2179, KCOM 2187, KCOM 2188, KCOM 2651, KCOM 2660, KCOM 2661)
YB 5	<i>Neisseria</i> sp. (KCOM 2600, KCOM 2601, KCOM 2602)
YB 13	<i>Neisseria subflava</i> (KCOM 2604, KCOM 2605)
YB 14	<i>Neisseria</i> sp. (KCOM 2606, KCOM 2607)
YB 15	<i>Neisseria subflava</i> (KCOM 2609, KCOM 2610, KCOM 2639, KCOM 2655, KCOM 2656)
YB 16	<i>Neisseria subflava</i> (KCOM 2611, KCOM 2612)
YB 19	<i>Neisseria</i> sp. (KCOM 2566, KCOM 2642, KCOM 2657, KCOM 2623, KCOM 2624, KCOM 2625)
YB 20	<i>Aggregatibacter aphrophilus</i> (KCOM 2567, KCOM 2568, KCOM 2570) <i>Neisseria</i> sp. (KCOM 2626, KCOM 2627, KCOM 2628)
YB 21	<i>Fusobacterium nucleatum</i> (KCOM 2572, KCOM 2573, KCOM 2582, KCOM 2576) <i>Capnocytophaga</i> sp. (KCOM 2575, KCOM 2577, KCOM 2583, KCOM 2589) <i>Propionibacterium acnes</i> (KCOM 2578, KCOM 2580, KCOM 2584, KCOM 2586, KCOM 2588)
YB 22	<i>Capnocytophaga</i> sp. (KCOM 2590, KCOM 2595) <i>Fusobacterium nucleatum</i> (KCOM 2591, KCOM 2594, KCOM 2596, KCOM 2597, KCOM 2598) <i>Neisseria subflava</i> (KCOM 2630, KCOM 2646, KCOM 2635, KCOM 2637)

KCOM, Korean Collection for Oral Microbiology.

Table 5. The summary of the optimal growth condition of the three *Capnocytophaga* strains which are candidates of new species

Strains	Range of optimal growth condition		
	Temperature, °C (best)	pH (best)	NaCl, % (best)
<i>Capnocytophaga</i> sp. KCOM 2191	35~40 (35)	6.5~9.0 (8.0)	0~1 (1)
<i>Capnocytophaga</i> sp. KCOM 2595	35~40 (40)	6.5~9.0 (8.0)	0 (0)
<i>Capnocytophaga</i> sp. KCOM 2668	30~35 (35)	4.5~6.0 (5.5)	0 (0)

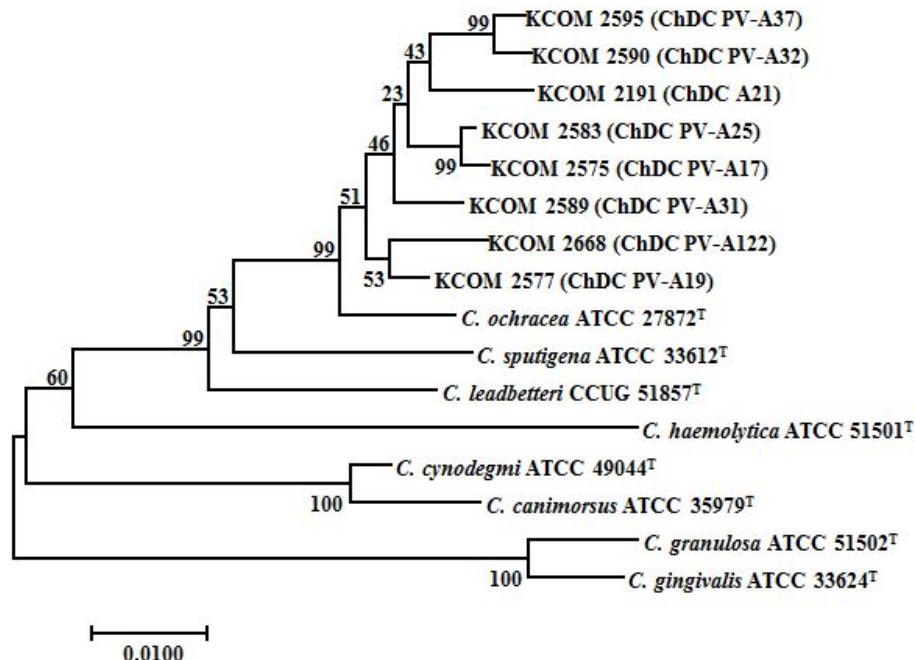


Fig. 1. Phylogenetic trees base on the partial nucleotide sequence of 16S rDNA of type strains and clinical isolate of genus *Capnocytophaga*. The resulting tree topology was evaluated by bootstrap analyses of the neighbor-joining tree based on 1,000 resamplings. The scale bar (neighbor-joining distance) represents a 5% difference in nucleotide sequence.

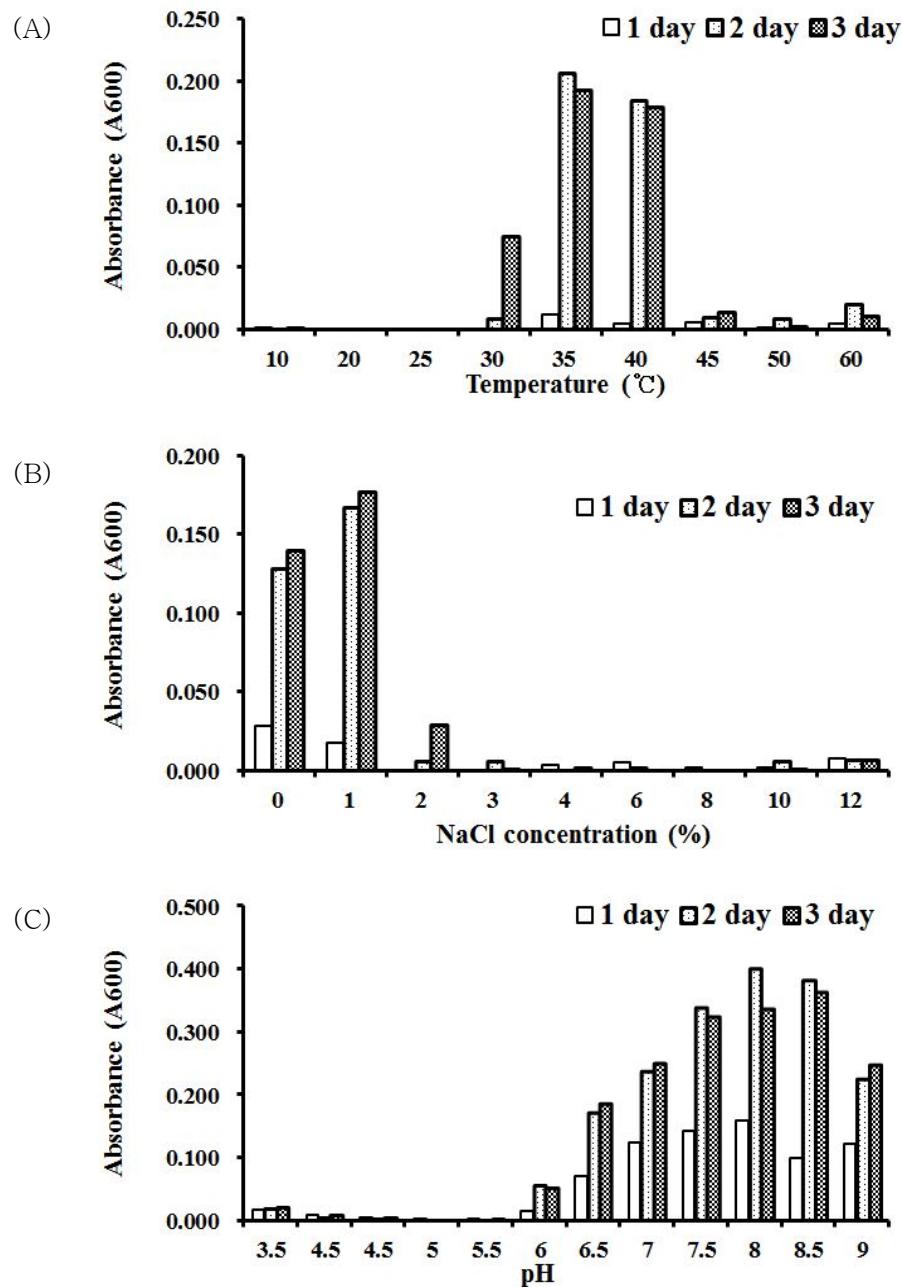


Fig. 2. Optimal growth condition of *Capnocytophaga* sp. KCOM 2191 for (A) temperature, (B) NaCl concentration, and (C) pH.

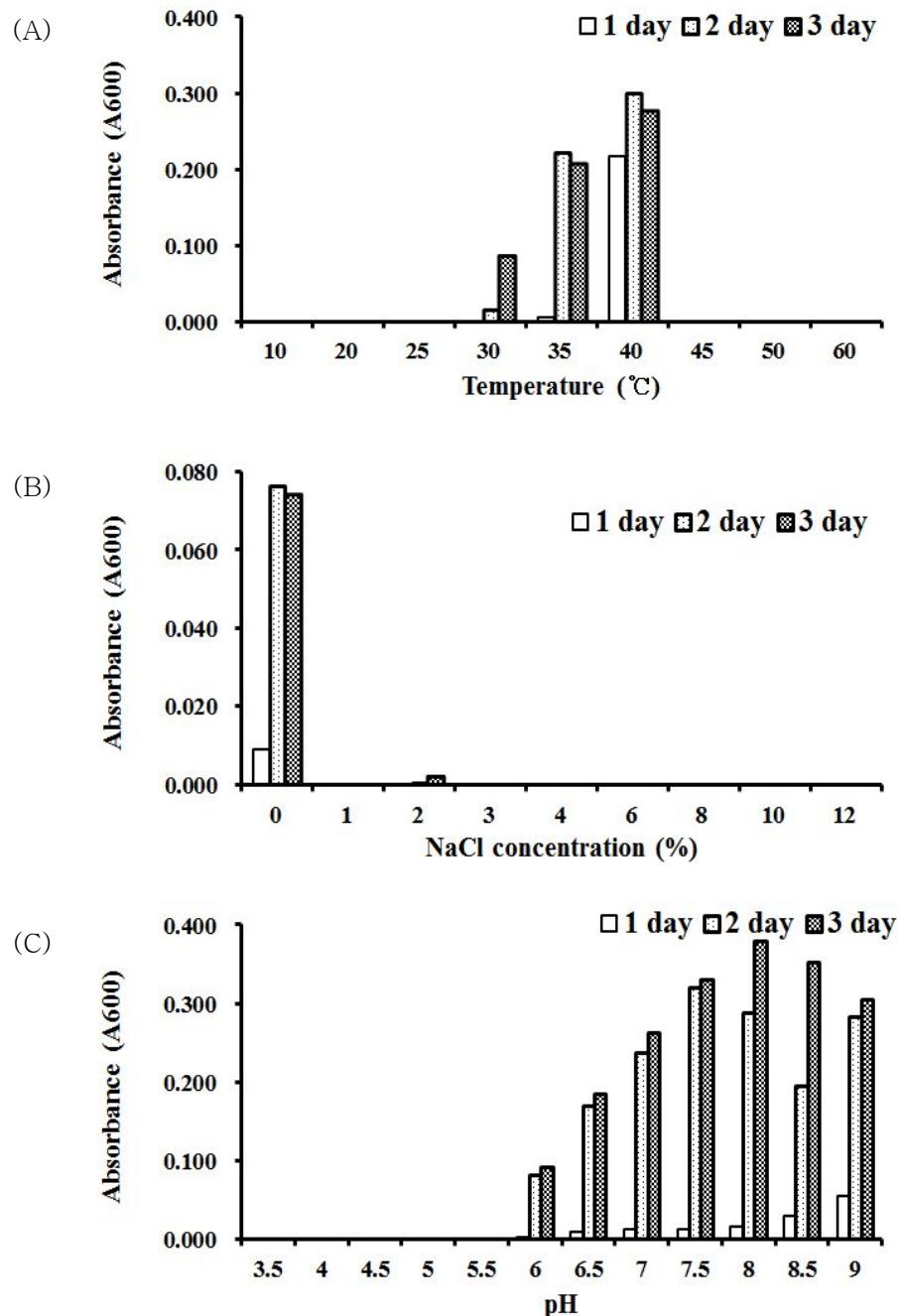


Fig. 3. Optimal growth condition of *Capnocytophaga* sp. KCOM 2595 for (A) temperature, (B) NaCl concentration, and (C) pH.

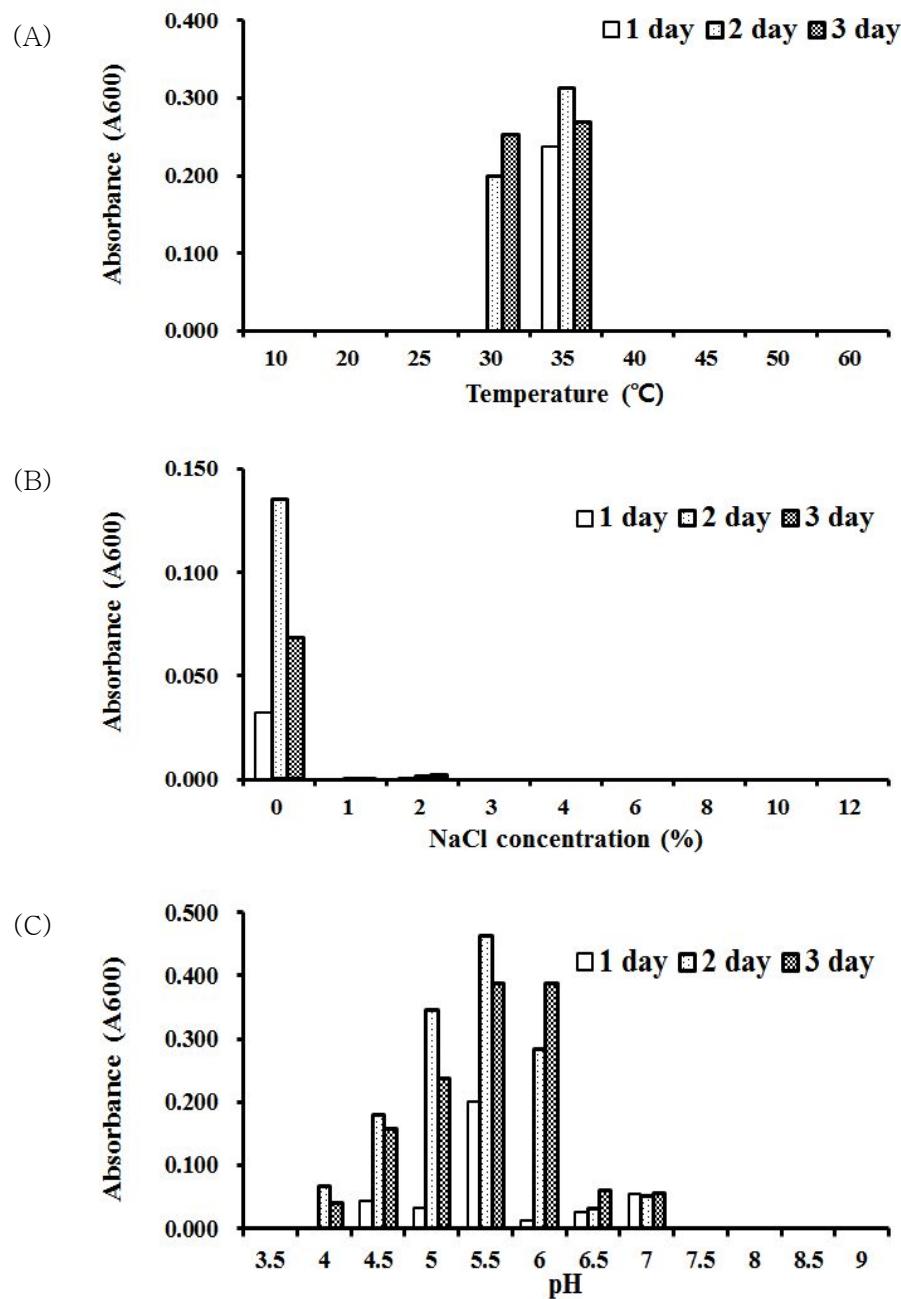


Fig. 4. Optimal growth condition of *Capnocytophaga* sp. KCOM 2668 for (A) temperature, (B) NaCl concentration, and (C) pH.

IV. 종괄 및 고안

본 연구에서 *A. actinomycetemcomitans* 선택배지인 TSBV 배지를 이용하여 한 국인의 치면세균막 및 타액으로 분리된 82 균주를 16S rDNA 핵산염기서열 비교 분석법에 의해 종 수준으로 동정한 결과 이들 균주들은 13개 종 및 종 수준에서 동정이 되지 않은 4-5개 속에 속하는 것임을 알 수 있었다. 본 연구에서 사용된 82 균주들 중 *Capnocytophaga* spp., *Neisseria* spp., *Fusobacterium* spp. 및 *A. aphrophilus*들이 각각 8, 42, 10 및 4 균주들이었다. 이러한 연구 결과는 기존의 TSBV 배지에서 자라는 *A. actinomycetemcomitans* 이외의 세균 종에는 *Capnocytophaga* spp., 와 *Neisseria* spp., 및 일부 *Aggregatibacter* spp. (*A. aphrophilus* 및 *A. segnis*)가 있다는 보고와 유사한 것이었다(Slots, 1982). 선택배지에는 일반적으로 표적 세균 종이 잘 자라기 하기 위한 기본 배지 성분과 다른 세균 종의 성장을 억제하는 성분으로 구성되어 있다. 즉, TSBV 배지에는 *A. actinomycetemcomitans* 성장을 위한 기본 배지인 tryptic soy agar와 그람 연쇄구균, 포도구균 및 *actinomyces* 등의 양성 세균의 성장을 억제시키기 위해 bacitracin과 vancomycin이 첨가되어 있고, hemin을 성장에 필요로 하는 *Haemophilus* spp.의 성장을 억제하기 위해 양 피(sheep blood)를 사용하는 대신 말 혈청(horse serum)을 사용하였다(Slots, 1982). 하지만, 본 연구 결과 연쇄 구균 및 포도구균들이 각각 1 균주씩 동정되었다. 이러한 결과는 연쇄구균 및 포도구균 균주들은 bacitracin과 vancomycin에 대한 내성을 갖는 균주들이기 때문인 것으로 생각된다. 또한, 본 연구에서 동정된 *Haemophilus parainfluenzae* 종은 일반적으로 hemin이 성장에 필수적이지 않기 때문에 본 연구에서 1 균주가 동정된 것이라 생각된다. 본 연구에서 동정된 TSBV 배지에서 자라는 *A. actinomycetemcomitans* 이외의 균주들을 이용하면, 새로운 *A. actinomycetemcomitans* 선택배지 개발이 용이할 수 있을 것이라 생각된다.

본 연구 결과 16S rDNA 핵산염기서열 비교분석법에 의해서 종-수준으로 동정이 되지 않은 7개의 *Capnocytophaga* spp. 균주들이 분리되었고, 이들 균주들은 기존의 표준균주들의 16S rDNA 핵산염기서열과 98.7% 이하의 상동성을 보여 새로운 균종이라 판단되었다. 세균을 종-수준으로 동정하는 황금 기준(golden

standard)은 16S rDNA 핵산염기서열 결정법과 DNA-DNA hybridization 법으로 알려져 있다(Stackebrandt and Goebel, 1994). 16S rDNA 핵산염기서열의 상동성을 기준으로 종-수준으로 구별할 때, 사용하는 가장 높은 상동성은 연구 결과에 따라 97% 또는 98.7–99%까지 다양하게 제시되었다(Stackebrandt and Goebel, 1994; Tindall *et al.*, 2010). 그려므로 본 연구에는 이들 기준 중 98.7%를 선택하였다. 하지만, 세균 종에 따라서는 16S rDNA 핵산염기서열이 서로 99% 이상인 경우가 많기 때문에 16S rDNA 핵산염기서열 비교 결정법으로는 완벽한 세균 종-수준에서의 동정이라고 할 수는 없기 때문에 DNA-DNA hybridization 법을 시행해야 하는 경우가 있다(Cho *et al.*, 2015). 하지만, DNA-DNA hybridization 법은 연구자에 따라 매우 다양한 값을 얻을 수 있고, 편차가 크다는 단점이 있다. 최근 차세대 핵산염기서열 결정법의 눈부신 발전에 의해, 까다로운 DNA-DNA hybridization 법을 대체할 수 있는 세균 지놈 ANI (average nucleotide identity) 법이 소개되었다(Goris *et al.*, 2007; Richter and Rossello, 2009). 이들의 연구에 의하면, 두 세균을 다른 세균 종으로 분류할 수 있는 DNA-DNA hybridization 법의 기준이 70%에 해당하는 것이, ANI 분석에 의한 두 균주간의 상동성이 94% 또는 95–96%라고 보고하였다(Goris *et al.*, 2007; Richter and Rossello, 2009). 아직까지는 모든 세균 종들에 대한 ANI 분석에 의한 데이터가 없고, DNA-DNA hybridization 법에 비해 경제적인 측면에서 단점을 있지만, 가까운 장래에는 DNA-DNA hybridization 법을 대신하여 세균 종-수준에서의 분류에 황금기준이 될 것이라 생각된다. 향후 연구에서 신균종이라 생각되는 *Capnocytophaga* spp. 균주들의 지놈 핵산염기서열을 결정하여 ANI 분석에 의한 신균종 확립을 시도하고자 한다.

신균 종의 확립에 있어서 16S rDNA 핵산염기서열 비교분석 및 DNA-DNA hybridization 결과 이외에도 균주의 지방산 분석, 생화학검사 결과, 최적 성장 조건(온도, pH 및 NaCl 농도) 등의 데이터도 필요로 한다. 본 연구에서 신균종이라 생각되는 3균주의 *Capnocytophaga* sp.에 해당하는 균주들의 최적의 성장조건을 측정한 결과 세 균주들은 30–40°C의 범위 내에서 최적의 성장을 보였다 (Fig. 2–4 및 Table 5). 온도에 따른 세 균주의 성장률을 보여주는 흡광도 값과 각 세균들의 pH에 따른 성장도를 보는 흡광도 값을 비교할 때, 본 연구에서 사

용된 35°C 및 40°C에서의 흡광도 값이 최적 pH 때의 흡광도 값보다 낮았다. 이는 최적 pH 값을 구할 때의 온도가 37°C이었음을 감안할 때, 실제 최적의 성장률을 보이는 온도는 37°C임을 암시한다고 할 수 있다. 또한, NaCl 농도에 따른 세균주들의 성장률을 나타내는 흡광도 값과, pH에 따른 성장률을 나타내는 흡광도 값을 비교할 때도 본 연구에서 사용된 0% 및 1%의 NaCl 농도의 흡광도가 매우 낮았다. 이러한 결과도 최적 pH를 측정할 때 및 세균주를 처음 분리했을 때 사용한 배지에 0.5%의 NaCl이 첨가되었던 것을 참고하면, 이들 세균주들의 최적 성장을 위한 NaCl 농도는 0.5%일 것이라 생각된다. 차후에 이러한 차이점을 증명할 수 있는 연구를 시행하여, 최적의 성장 조건을 찾을 예정이다. KCOM 2191와 KCOM 2595 균주들이 pH 8.0에서 최적의 성장을 한 반면, KCOM 2668은 특이하게 산성인 조건(pH 4.5~6.0)에서 최적의 성장을 보였다. KCOM 2668을 처음 분리할 때 사용하였던 TSBV 배지가 pH 7.0이었고, 이 때 이 균주의 성장이 다른 균주들보다 늦었던 점을 감안할 때, KCOM 2668는 다른 *Capnocytophaga* spp. 균주들 보다는 산성인 조건에서 더 잘 자라는 특이한 균주라 생각된다. 이들 세균주들의 신균종으로 확립하기 위해, 향후 연구에서 전술한 ANI 분석을 포함한, 지방산 조성, G+C 함량 분석, 생화학 검사, 항생제 내성 검사 등을 실시하여 이들 균주들의 신균종 확립하는 연구를 진행할 예정이다.

본 연구에서 사용된 균주들은 혐기성 조건에서 분리된 균주들이었다. 이러한 이유로 본 연구에서도 혐기성 조건에서 배양을 하여 본 실험에 사용하였다. 하지만, TSBV 배지를 이용하여 *A. actinomycetemcomitans* 균주를 배양할 경우 혐기성 조건보다는 5% CO₂가 공급되는 공기 상태에서 더 잘 자란다는 보고가 있다 (Martijn et al., 1986). 그러므로 향후 연구에서 *A. actinomycetemcomitans* 균주를 선택적으로 배양하기 위해 TSBV 배지를 사용할 경우에는 5% CO₂가 공급되는 공기 상태에서 배양을 하고자 한다.

최근의 연구에 의하면, TSBV 배지를 이용하는 것보다 Dentaid-1 배지를 이용할 경우 더 많은 수의 *A. actinomycetemcomitans*를 분리할 수 있으며, 배지를 만드는 가격도 더 저렴하다는 것이 보고되었다(Rurenga et al., 2013). 그러므로 현재까지 개발된 *A. actinomycetemcomitans* 선택배지 중에서는 Dentaid-1 배지를 사용하는 것을 권장할 수 있다.

이상의 연구 결과를 종합하면, TSBV 배지에는 *A. actinomycetemcomitans* 이외에도 *Aggregatibacter aphrophilus*, *Campylobacter* sp., *Capnocytophaga* sp., *Fusobacterium nucleatum*, *Fusobacterium* sp., *Neisseria* sp., *P. acnes*, *H. parainfluenzae*, *Leptotrichia wadiei*, *V. dispar* 및 bacitracin과 vancomycin에 내성을 갖는 연쇄구균과 포도구균이 자랄 수 있음을 알 수 있었다. 향후 연구에서 본 연구 결과에서 얻은 균주들을 이용하면, 효율성이 높은 *A. actinomycetemcomitans* 선택배지 개발이 용이할 것으로 생각된다.

V. 결 론

본 연구는 TSBV 배지에서 분리되었지만, 종 수준으로 동정이 되지 않은 82균주를 한국구강미생물자원은행(KCOM, Korean Collection for Oral Microbiology, Gwangju, Korea)에서 분양받아 16S rDNA 핵산염기서열 비교 결정법으로 동정하여 TSBV에서 성장하는 타 균주들의 종류에 대해 알아보기 위해 시행하였으며, 다음과 같은 결과를 얻었다.

1. 본 연구에서 사용된 균주들의 16S rDNA 핵산염기서열을 결정하여 EzTaxon 프로그램(<http://www.ezbiocloud.net/eztaxon>)을 이용하여 상동성을 검색한 결과 13개 세균 종(*Aggregatibacter aphrophilus*, *Campylobacter gracilis*, *Campylobacter rectus*, *Campylobacter showae*, *Capnocytophaga ochracea*, *Fusobacterium nucleatum*, *Fusobacterium periodonticum*, *Haemophilus parainfluenzae*, *Leptotrichia wadei*, *Neisseria flava*, *Neisseria subflava*, *Propionibacterium acnes*, *Veillonella dispar*)과 종-수준으로 동정이 안 된 4-5개 속(*Capnocytophaga* sp., *Neisseria* sp., *Neisseria* sp./*Morococcus* sp., *Staphylococcus* sp., *Streptococcus* sp.)에 속하는 균주들이 TSBV 배지에서 자라는 것으로 확인하였다.
2. 본 연구 결과 신균종 가능성이 있을 것으로 예상되는 *Capnocytophaga* 속으로 분류된 KCOM 2191, KCOM 2575, KCOM 2583, KCOM 2589, KCOM 2590, KCOM 2595, KCOM 2668의 7개 균주를 얻었다.
3. 본 연구에서 신균종 가능성이 있는 7개 균주 중에서 검출 대상이 중복되지 않도록 한 명의 환자에서 한 균주만을 선별하여 KCOM 2191, KCOM 2595 및 KCOM 2668 3균주를 신종 가능성이 있는 균주로 선정하였다. 이들 균주들의 신종으로 확립하기 위한 실험 중 하나인 최적성장조건을 조사한 결과 세 균주들은 30-40°C의 범위 내에서 최적의 성장을 보였다. NaCl 농도에 따른 성

장 결과 세균 모두 NaCl이 없는 조건에서 잘 자랐으며, KCOM 2191은 NaCl 1% 농도에서도 최상의 성장을 하였다(Fig. 및 Table 5). KCOM 2191와 KCOM 2595 균주들이 pH 6.5~9.0의 범위에서 최적의 성장을 보인 반면, KCOM 2668(PV-A122)은 pH 4.5~6.0 사이에서 최적의 성장을 보였다.

이상의 연구 결과를 종합하면, TSBV 배지에는 *A. actinomycetemcomitans* 이외에도 9개 속에 속하는 그람 음성 세균 종들 및 bacitracin과 vancomycin에 내성을 갖는 그람 양성 세균들도 자랄 수 있음을 알 수 있었다. 또한, 신균종이라 생각되는 *Campylobacter* sp. 7균주도 동정되었다. 본 연구의 결과를 바탕으로 향후 연구에서 새로운 *A. actinomycetemcomitans* 선택배지 개발이 가능할 것으로 생각된다.

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Supplementary Table 1. 16S rDNA sequences (1,462 bp) of Capnocytopha sp. KCOM 2171

Sequences (5' > 3')
ATTGACGCTGGCGCAGGGTTAACACATGCAAGTCGAACGGTAGCAGGTAACTGTACTTATGCTGACGAGTGGCG GACGGGTGAGTAATGCTGGGATCTGGCTTATGGAGGGGATAACGACGGAAACTGTCGCTAACCGCGTAGAATCG AGAGATGAAAGTGTTGGACCTTCGGGCCACATGCCATAGGATGAGCCAACTGTCGCTAACCGCGTAGAATCG CTACCAAGCCGACGATCTCTAGCTGGCTGAGAGGTGACCAGCCACACCGGACTGAGACACGGCCGACTCTACGG GAGGCAGCAGTGGGAATATTGCGCAATGGGGCAACCTGACGCAGCCATGCCGCTGAATGAAGAAGGCCTTGGGTT GTAAAGTTCTCGGTGACGAGGAAGGCGTGTAGTTAATAGGCATCACGATTGACGTTAACAGAAGAACCGGC TAACCTCGTGCAGCAGCCGGTAATACGGAGGTCGAGCTTAATCGGAAACTGGCGTAAGGGCACGCAGGCG ACTTTAACGTGAGGTGTAAATCCCCGGCTTAACCTGGGAAATTGCACTTCAGACTGGGGCTAGAGTACTTTAGGGAG GGGTAGAATTCACGTGTAGCGTGAATGCGTAGAGATGTGGAGGAATCGAAGGCGAAGGCAGCCCTGGGAAATGT ACTGACGCTCATGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATAACCTGGTAGTCCACGCTGTAAACGCTGTGATT GGGGATTGGGCTTAAGCTGGTGCCTAGCTAACGTGATAAATCGACCCGCTGGGAGTACGGCGCAAGGTAAAA CTCAATGAATTGACGGGGCCCGACAAGCGGTGGAGCATGTGGTTAACCGATGCAACGCGAAGAACCTTACACT CTTGACATCCATGGAATCTGTAGAGATGTAGGTGCTTCGGGAAACCATGAGACAGGTGCTGATGGCTGTGTCAGC TCGTGTTGTGAAATGTTGGGTTAGTCCCACAGAGGCGACGAAGCGCGAGGTGGAGTGAATCTACAAAGTACGCTAACG AAAGGAGACTGCCGTGATAAACCGGAGGAAGGTGGGATGACGTCAAGTCATCATGCCCTACGAGTAGGGCTACACA CGTGTACAATGGCGTACAGAGGGCGACGAAGCGCGAGGTGGAGTGAATCTACAAAGTACGCTAACG GAGTGTGCAACTCGACTCCATGAGTCGAATCGTAGTAATCGCAATCAGAATGTCGCGGTGAATACGTTCCGGGATT TTGTACACACCGCCGTACACCATGGAGTGGGTGTACCGAAGTAGATAGCTAACCTCGGGAGGGCTTACAC GGTATGATTGACTGGGTG

Supplementary Table 2. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2172

Sequences (5' > 3')
ATTGACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGATAACTAATCGAAAGATTAGCTAACCGCATATCTCT GAGGAAGAAAGCAGGGACCATTTGGCCTGCGCTGTTGAGCGGCCATATCTGATTAGCTAGTTGGTGGGGAAAGGC CTACCAAGCCGACGATCAGTAGCGGTCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCCTGATCCAGCCATACCGCGTCTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTAGGGAGAAAAGGGCGGGTTAACCTCGTGTAGCGTACCTGAAGAATAAGCAGCG TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGTAGCGTTAACCGAATTACTGGCGTAAGCGGGCGAGACG GTTACTTAAGCAGGATGTGAAATCCCCGGCTAACCTGGAACTCGCTCTGAACCTGGTACTAGAGTGTGAGG GAGGTAGAATTCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAATCCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTCATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAAACGATGTCGATT AGCTGTTGGGAGCATGACTGCTTAGTACGCAAGCTAACCGTGTAAATCGACCCGCTGGGAGTACGGTCGCAAGATTAA AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACGCGAAGAACCTTACCTG GTCTTGACATGACGAATCTCAGAGACGGAGGGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTGTC GCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGCAACCCCTGTGATTAGTGTGCTCATTAAGTGGGACT CTAATGAGACTGCCGTGACAAGCCGGAGGAAGGTGGGAGTACGTCAGTCAGTCCTCATGCCCTATGACCAGGGCTTAC ACGTCAACATGGCGTACAGAGGGTAGCCAAGCCCGAGGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT GCACTCGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTAGTACGTTCCGGGT CTTGTACACACCGCCGTACACCATGGAGTGGGGATACCGAAGTAGTAGGTAGGGTAACCGCAAGGAGCCCCTACCA CGGTATGCTTACATGTCTGGGTG

Supplementary Table 3. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2647

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTTGGGCTTGCCTGTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCTGTTGAGACAGGCTTGGGTAAAGCAGCAGC GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCGGTGGGACTGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACT GAGGTTAGAATTCCACGTGTAGCAGTGAATGGGAGGATACCGATGGCGAAGGCCTTGGGAGTACGGTCSAAGGTTAA AACTCAAAGGAATTGACGGGACCCGCMCAASCCTGGGATGATGTGAGGTTAACCTGATGCAACCGCAAGAACCTTACCTG GTCTGGCATGCGGAATCTCAGAGACGGAGGAGTGCCTGGGAGCGTAACACGGTGTGATGGCTGTGCGTCA GCTCGTGTGAGATGTTGGGTTAACCGCGCAACGGCGAACCCCTGTGATTAGTTGCCATCTAGTTGGGACT CTAATGAGACTGCCGGTGAACAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAAGGGCTTCAC ACGTATACAATGGTGGTACAGAGGTAGCCAAGCCGGAGGTTAACCGATCTCACAAAACCGATCGTAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGCTTACCA CGGTATGCTTACGACTGGGTG

Supplementary Table 4. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2659

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTTGGGCTTGCCTGTTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGCGGGGTTAACCTCTGTTGAGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCTGGGACTGCTGTTGAGACAGGCTTGGGAGTACGGTCA GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGCTGTTGAGACAGGCTTGGGAGTACGGTCA GAGGTTAGAATTCCACGTGTAGCAGTGAATGGGAGGATACCGATGGCGAAGGCCTTGGGAGTACGGTCA CACTGACGTTCATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACCGATGTCGATT AGCTGTTGGGAGCATGACTGCTTAGCTAGCGAAGCTAACCGTGAATGACCCGCTGGGAGTACGGTCA AACTCAAAGGAATTGACGGGACCCGCAACGGGTGGATGATGTGAGGTTAACCTGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGCGAACCTCCAGAGACGGAGGGTGCCTGGGAGCGTAACACGGTGTGATGGCTGTGCGTCA GCTCGTGTGAGATGTTGGGTTAACCGCGAACAGCGCAACCCCTGTGATTAGTTGCCATCTAGTTGGGACT CTAATGAGACTGCCGGTGAACAGCCGGAGGAAGGTGGGAGTACGTCAAGTCCTCATGGCCTTATGACCAAGGGCTTCAC ACGTATACAATGGTGGTACAGAGGTAGCCAAGCCGGAGGTTAACCGATCTCACAAAACCGATCGTAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGCTTACCA CGGTATGCTTACGACTGGGTG

Supplementary Table 5. 16S rDNA sequences (1,439 bp) of Capnocytopha sp. KCOM 2668

Sequences (5' > 3')
GATGAACGCTAGCGCAGGCCAACACATGCAAGTCGAGGGGGAGGTACTTCGGTAACTGAGACCGCGTACGGGT CGTAAACCGTATAACATCTGCCCTCACTGGGGATAGCCGAAGAATTGGATTAAACCCCAGTATAGTAGTGTG GCATCACACAACATTAAAGCTAGGTGAAAGATGAGTATGCCCTATTAGCTAGTTGGAGAGGTACGGCTCCCC AAGGCTACGATAGATAGGGGCTGAGAGGGATGCCCAACTGGTACTGAGATACGGACAGACTCCTACGGGAGGC AGCAGTGAGGAATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCCGTGCAGGATGAAGGCTTATGGATTGAA ACTGCTTTGTAAGGGAAGAATAAGAGCTACGTGAGTTGATGACGGTACCTTACGAAATAAGCATCGGCTAACCCGT CCAGCAGCCCGGTAATACGGGATGCGAGCGTATCCGAATCA TGGGTTAAAGGGCTGTAGGCGGGCTGGTAAG TCAGAGGTAAAGCGCTAGCTCAACTAACGAACTGCCCTGAAGACTGTTGTTGAATGGTTGAAAGTAGTTGAAT GTGTAGTGTAGCGGTAAATGCTAGTATTAACAGAACCGATAGCGAAGGCATATTACCAAAATTGACGT GATGGACGAAAGCGTGGGGAGCAACAGGATTAGATACCGTGTAGTCACGCTGTAACGATGGATACTAGCTGTTGG TTAAGGATTGAGTGGCTAACGCAAAGTGTAAAGTCCACCTGGGAGTACGTTGCAAGAATGAAACTCAAAGAATT GACGGGGGCCGACAAGCGGTGGAGCATGTTAATTCGATGATACGCGAGGAACCTTACCAAGGTTAAATGGGA CTGACAGGGGTAGAGATACCTTTCTCGGACGTTCAAGGTGCTGCATGGTTCGTCAGCTGCGTGGAGGT TCAGGTTAAGTCTATAACGAGCGCAACCCCTGCCATTAGTGTGCAACGAGTTGAGTCGAGCCTCTAATGGACTGCG GTGCAAACCGTGGAGGAAGGTGGGATGACGTAAATCATCACGGCCCTACATCTGGGCTACACACGTGCTACAATGCC CGTTACAGAGAGCAGCACTCGTGTAGCAGGCGGAACATCTAAAGACGGTCACAGTCGGATGGAGTCTGCAACTCGA CTCCGTGAAGCTGGATCGTAGTAACTCGATACGCCATGATCCGGTAACGTTCCGGGCTTGTACACACCGCC CGTCAAGCCATGGAAGCTGGGAGTACCTGAAGACGGTCACCGCAAGGAGCTGGTAAAGTAGTGAETGGG

Supplementary Table 6. 16S rDNA sequences (1,470 bp) of Capnocytopha sp. KCOM 2177

Sequences (5' > 3')
GACGAACGCTGGGGCGTGCATAACATGCAAGTAGAACGCTGAAGAGAGGAGCTGGCTCTTGGATGAGTTGCGAA CGGGTGAGTAACCGTAGGTAACTGCCCTGTAGCGGGGATAACTATTGAAACGATAGCTAAACCGCATAACATGG ATGACACATGTCATTATTTGAAAGGGCAATTGCTCCACTACAAGATGGACCTGCGTTGATTAGCTAGTAGGTGAGGT AACGGCTCACCTAGGCAGCAGATACTAGCCGACCTGAGAGGGTGTACGGGACACTGGGACTGAGACACGGCCAGACTC CTACGGGAGGCAGCAGTAGGGAATCTCGCAATGGGCAACCCCTGACCGAGCAACGCCCGTGAAGAAGGTTT CGGATCGTAAAGCTCTGTTGTAAGTCAGAACGAGTGTGAGAGTGGAAAGTTCACACTGTGACGGTAGCTTACAGAAAG GGACGGCTAACTACGTGCCAGCAGCGCGTAATACGTAGGTCGAGCGTTGTCGGGATTATTGGCGTAAGCAAGC GCAGGGGTTGATACGTCAGGTTGAAATCCATGTGAGCGTGAATGCTAACCATAGTCGCTTGGAAACTGTCAAACTGAGTCAG AAGGGAGAGTGGAAATTCCATGTGAGCGTGAATGCTAGGATATGGAGGAACACGGTGGCGAAAGCGGCTCTGT GTCTGTAACTGACGCTGAGGCTGAAAGCGTGGGAGCGAACAGGATTAGATACCCCTGGTAGTCCACGCCGTAACGATG AGTGTAGGTGTTGGATCTTCCGGATTCACTGCGCAGCTAACGCTTAAGCAGTCCGCTGGGAGTACGACCGCA AGGTTGAAACTCAAAGGAATTGACGGGGCCGACAAGCGTGGAGCATGTTAATTCGAAGCAACGCGAAGAAC TTACCAAGGTCTGACATCCGAWRcTAKTCTAGAGATAGAAAGTTACTCGGTACATCGGTGACAGGTGGTCATGGTT GTCGTAGCTCGTGTGAGATGTTGGGTAAGTCCCGCAACGAGCGAACCCCTATTGTTAGTGGCCATATTAGTT GGGCACTCTAGCGAGACTGCCGTAATAAACCGGAGGAAGGTGGGAGTACGTCAGTAAACATCATGCCCTATGACCTGG GCTACACACGTGCTACAATGGTGGTACAACGAGGTTGCGAGTCGGTGACGCCAGCTAATCTCTAAAGCCAATCTCAGT TCGGATTGTAAGGTCGAACTGCCCTACATGAAGTCGGATCGTAGTAACTCGGGATCAGCACGCCGGTGAATACGTT CCCGGGCTTGTACACACGCCGTCACACCACGAGAGTTGTAACACCCGAAGTCGGTGAGGTAACCTGTTGGAGCCAG CGGCCCTAAGGTGGGATAGATGATTGGGTG

Supplementary Table 7. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2178

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT GAGGAAGAAAGCAGGGGACCTTGGGCTTCGCGTGTGAGCGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCAGGGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCGTGGGACTGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACT GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGATACCGATGGGACTGAGGAGGATACCGATGGCAGGCGAGCCTGGGATAA CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCGATT AGCTGTTGGGAGCATGACTGCTTAGTACCGTGGGACTGAGGATGATGGGACTGAGGAGGATACCGATGGCTGGGATAA AACTCAAAGGAATTGACGGGACCCGCACAGCGGTGGATGATGGGATTAATTCGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGACGGGACCCCTCAGARACGGAGGGGTCGCTCGGAGCGTAACACAGGTGTCGATGGCTGCGTA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACCGAGCGCAACCCCTGTCATTAGTTGCCATCATTAAGTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC ACGTATACAATGGTGGTAGCAGAGGTTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGTCCCGGATT CTTGTACACACCGCCCGTACACCATGGAGTGGGGATACCGAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA CGGTATGCTTATGACTGGGTG

Supplementary Table 8. 16S rDNA sequences (1,465 bp) of Capnocytopha sp. KCOM 2179

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT GAGGAAGAAAGCAGGGGACCTTGGGCTTCGCGTGTGAGCGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCAGGGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGAGGATGATGGGACTGAGGAGGATACCGATGGCAGGCGAGCCTGGGATAA CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCGATT AGCTGTTGGGAGCATGACTGCTTAGTACCGAAGCTAACCGTGGGACTGAGGAGGATACCGATGGCTGGGAGTACGGTGCAGGATTA AACTCAAAGGAATTGACGGGACCCGCACAGCGGTGGATGATGGGATTAATTCGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGACGGGACCCCTCAAGACGGGAGGGTGCCTTCAGGGAGCGTAACACAGGTGTCGATGGCTGCGT CAGCTCGTGTGAGATGTTGGGKTAAGTCCCGCAACAGCGCAACCCCTGTCATTAGTTGCCATCATTAAGTGGGCA CTCTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTC ACACGTATACAATGGTGGTAGCAGAGGTTAGCCAAGCCGGAGGTGGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTC TTGCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGTCCCGA GTCTTGACACACCGCCCGTACACCATGGAGTGGGGATACCGAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTAC CACGGTATGCTTATGACTGGGTG

Supplementary Table 9. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2186

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT GAGGAAGAAAGCAGGGGACCTTGGCCTGCGTGTGAGCGGCCATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCAGCATCAGTAGCGGGTCTGAGAGGATGATCCGCACACTGGGACTGAGACACGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAC TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCAGGCGACAGC GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCGGTGGGACTGAGGATGATCCAGGCCATGGGACTGAGGTGACTAGAGTGTGTCAGAGG GAGGTAGAATTCCACGTGTAGCAGTGAATGGGAGGATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCGATT AGCTGTTGGCAGCATGACTGCTTAGTACCGGTGGGACTGAGGATGATCCAGGCCATGGGACTGAGGTGACTAGAGTGTGTCAGAGG AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGGATTAAATCGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGTACCGAATCTCAGAGACGGAGGATGCGCTTGGGAGCGTAACACAGGTGCTGATGGCTGTCGTA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACCGAGCGCAACCCCTGTCTGATTAGTTGCCATCATTAAGTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC ACGTATACAATGGTGGTAGCAGAGGTTAGCCAACCGCGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTGGTAGCTAGTAATCGCAGGTAGCATACTGGGTGATACTGTCGGGTT CTTGTACACACCGCCCGTACACCATGGAGTGGGGATACCGAGAAGTAGGTAGGGTAACCGCAAGGAGCCCCTACCA CGGTATGCTTACGACTGGGTG

Supplementary Table 10. 16S rDNA sequences (1,464 bp) of Capnocytopha sp. KCOM 2187

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT GAGGAAGAAAGCAGGGGACCTTGGCCTGCGTGTGAGCGGCCATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCAGCATCAGTAGCGGGTCTGAGAGGATGATCCGCACACTGGGACTGAGACATGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCAGGCG TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCAGGCGACAGC GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGAACTGCGTCTGAACTGGGACTGAGGTGACTAGAGTGTGTCAGAGG GAGGTAGAATTCCACGTGTAGCAGTGAACCGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCGATT AGCTGTTGGCAGCATGACTGCTTAGTACCGAAGCTAACCGGTGGGACTGAGGATGATCCAGGCCATGGGAGGAGTACGGTCGCAAGATTA AAACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAAATCGATGCAACCGCAAGAACCTTACCT GGTCTTGACATGTACCGAACCCCTCCAGAGACGGAGGGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTC AGCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACCGAGCGAACCCCTGTCTGATTAGTTGCCATCATTAAGTGGGAC TCAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC CACGTATACAATGGTGGTAGCAGAGGTTAGCCAAGGCCGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGAT TGCACCTGCAACTCGAGTGCATGAAGTGGGAATCGCTAGTAATCGCAGGTAGCATACTGGGTGATACTGTCGGGTT CTTGTACACACCGCCCGTACACCATGGAGTGGGGATACCGAGAAGTAGGTAGGGTAACCGCAAGGAGCCCCTACCA ACGGTATGCTTACGACTGGGTG

Supplementary Table 11. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2188

Sequences (5' > 3')

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ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT
GAGGAAGAAAAGCAGGGGACCTTGGGCTTCGCTTGGAGGGCCATATCTGATTTGGTAGCTAGTGGTGGGTAAGGC
CTACCAAGGCAGCAGCAGTAGCAGGGCTGAGAGGATGATCCGCACACTGGACTGAGACACGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCTGATCCAGGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTCCCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACGAAATTACTGGGCTAAAGCAGGGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTCGCTCTGAACGGTACTGGTAGACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCAGAGCAGCCTCTGGATAA
CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCGATT
AGCTGTTGGCAGCATGACTGCTTAGTACGCAAGCTAACCGCTGAAATCGACCGCCTGGGAGTAGGGTCGCAAGATTAA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAAATCGATGCAACGCGAAGAACCTTACCTG
GTCTTGACATGACGGAACCTCCAGAGACGGAGGGTGCCTCGGAGCGTAACACAGGTGTCATGGCTGTCGTC
GCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAAGTGGCACT
CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC
ACGTATACAATGGTGGTAGCAGAGGTTAGCCAACGCCGAGGTGGAGCCAATCTCACAAAACGATGTAATCCGGATT
GCACTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGCTTACCGG
CTTGTACACACGGCCCGTACACCATGGAGTGGGATACCAAGAAGTAGGTAGGTACCGCAAGGAGCCCTTACCA
CGGTATGCTTACGACTGGGTG

```

Supplementary Table 12. 16S rDNA sequences (1,438 bp) of Capnocytopha sp. KCOM 2191

Sequences (5' > 3')

```

GATGAACGCTAGCGGAGGGCTAACACATGCAAGTCGAGGGGGAGGTTACTTCGGGTACTGAGACCGCGTACGGTG
CGTAAACCGTATACAATTGCTTCACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGGGACG
GCATCGTTTATATTAAAGCTAGGTGGAAAGATGAGTATGCTTCTATTAGCTAGTTGGAGAGGTAACGGCTCCCC
AAGGGATGATAGATAGGGTCTGAGAGGGATGCCCCACACTGGTACTGAGATACGGACAGACTCCTACGGGAGGC
AGCAGTGAGGAATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCGCTGCAGGATGACGGCCTATGGTTGTAA
ACTGCTTTGTAAGGGAAAGATAAGGGTACCGCTAGTTGATGACGGTACCTTACGAAATAAGCATGGCTAACTCCGT
CCAGCAGCCCGGTAAATCGAGGATGCGAGCGTTACCGGAATCATTGGTTAAAGGGTCTGTAGGCGGGCTTGTAA
TCAGAGGTAAAGCGCTCAGCTCAACTGAGCAACTGCCCTGAAACTGTTGTTCTGAATGGTTGTGAAGTAGTTGAAT
GTGAGTGTAGCGGTAAATGCTTAGATATTACAGAACCCGATAGCGAAGGCATATTACTAACAAATTGACGCT
GATGGACGAAAGCGTGGGGAGCGAACAGGATTAGATAACCCCTGGTAGTCCACGCTGAAACGATGGATACTGCTGTTGG
AGCAATCTGAGTGGCTAAGGAAAGTGTAAAGTATCCACCTGGGGAGTACGTTGCAAGAATGAAACTCAAAGGAATTG
ACGGGGGCCGACAAGCGTGGAGCATGTTGTTAATTGATGATACGCGAGGAACCTTACCAAGGTTAAATGGAGAC
TGACAGGGTAGAGATACCCCTTCTCGACAGTTCAAGGTGCTGATGGTGTGTCAGCTGTCGCGTGGGT
CAGGTTAAGTCCATAACGAGCGCAACCCCTGCCATTAGTTGCTAACGAGTTATGTCGAGCCCTTAATGGACTGCCG
TGCAAAACCGTGAGGAAGGTGGGATGACGTCAAATCATACGCCCTACATCTGGCTACACACGTGCTACAATGCC
GTTACAGAGAGCAGCCACTCGTGAGCAGGCGCAATCTAAAGACGGTACAGTGGATCGGAGTCTGCAACTCGAC
TCCGTAGGCTGAATCGCTAGTAATCGGATATCAGCATGTCGGTGAATACGTTCCGGCCTTGTACACACCGCC
GTCAAGCCATGGAAGCTGGAGTACCTGAAGACGGTTACCGCAAGGAGCTGTTAGGGTAAACTAGTGAACGGGT

```

Supplementary Table 13. 16S rDNA sequences (1,476 bp) of Capnocytopha sp. KCOM 2915

Sequences (5' > 3')

```
GATGAACGCTGGCGCGTGCCTAATACATGCAAGTCGAGCGAACAGATAAGGAGCTTGCTCCTTGACGTTAGCGCGGAA
CGGGTAGTAACAGTGGATAACCTATAAGACTGGGATAACTTCGGGAAACCGGAGCTAATACCGGATAACATATT
GAACCGCATGGTCAATAGTGAAGGGCGCTTGTCACTTATAGATGGATCCGGCGTATTAGCTAGTTGGTAAGG
TAACGGCTTACCAAGGCACAGTACGTAGCCGACCTGAGAGGGTGTACGCCACACTGGAACGTGAGACACGGTCCAGACT
CCTACGGGAGGCAGCAGTAGGGAATCTTCGCAATGGCGAAAGCCTGACGGAGCAACGCCGTGAGTGTAGAAGGTCT
TCGGATCGTAWAYTCTGTTATCAGGGAAAGAACAAATATGTAAGTAACGTGACATCTTGACGGTACCTGATCAGAAA
GCCACGGCTAATACGTGCCAGCAGGCCGGTAATACGTAGGTGGCAAGGTTATCCGAATTATGGCGTAAAGCGCG
CGTAGGGCGTTTTAAGTGTGAAAGCCCACGGCTCACCGTGGAGGGTCTGGAAACTGGAAACTTGAGTGC
AGAAGAGGAAAGTGAATTCCATGTGTAGCGGTAAATGCGCAGAGATATGGAGGAACCCAGTGGCAAGGCACCTTC
TGGTCTGTAACTGACGCTGATGTGCGAAAGCGTGGGATCAACAGGATTAGATACCTGGTAGTCACGCCGTAACGA
TGAGTGCTAAGTGTAGGGGTTCCGCCCTAGTGTGCACTAACGCTTAAGGACTCCGCTGGGAGTACGACCG
CAAGGGTAAACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGAGCATGTGGTTATCGAAGCAACGCCAGA
CCTTACCAAATCTGACATCTTGACCGCTARARATARARKTTCYCCTCGGGGACAAGTGTACAGGTTGTCAT
GGTTGTCGTCACTCGTGTGAGATGTGGGTTAAGTCCGCAACGAGCGCACCCCTAAGCTTAGTTGCCATCATT
AGTTGGGCACTCTAAGTTGACTGCCGGTACAAACCGGAGGAAGGTGGGATGACGCTAAATCATGCCCCTTATGAT
TTGGGTCACACAGTGTACAATGGACAATACAAAGGGCAGCTAAACCGCAGGTCAGCAAATCCATAAGTTGTCAT
CAGTTGGGATTGTAGTCTGCAACTGACTACATGAAGCTGGATCGCTAGTAATGTAAGCTAGCATGCTACGGTAATA
CGTTCCGGGTTCTGTACACACCAGCCGTACACCCAGAGATTGTAACACCGAACCCGGTGGAGTAACCATTTATGG
AGCTAGCCGTCGAAGGTGGACAATGATTGGGTT
```

Supplementary Table 14. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2651

Sequences (5' > 3')

```
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTAACGGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCCTGCGTTACCGGGCCGATATCTGATTAGCTAGTTGGTGGGTTAAAGGC
CTACCAAGGCACGATCAGTAGCGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGCCAGACTCCTACGG
GAGGCAGCAGTGGGAAATTGGACAATGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCCTGGGTT
GTAAAGGACTTTGTAGGGAAAGAAAAGGCTGGCTAATATCGACAGCTGATGACGGTACCTGAAGAATAAGCAGGCC
TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGTGAGCGTTACCGAATTACTGGCGTAAGCGCAGAGC
GTTACTTAAGCAGGATGTGAATCCCCGGCTCACCTGGAACTCGTCTGAACCTGGTACTGGTGAAGAGTGTCAAGAGG
GAGGTAGAATTCCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAACCGATGGCAAGGCAGCCTCTGGGATAA
CACTGACGTTCATGCTCGAACAGCTGGTAGCAAACAGGATTAGATACCCGTAGTCCACGCCCTAAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGCTAGCGTAGTAACCGTGAATGGACCGCCTGGGAGTACGGTCGAAGATTAA
AACTCAAAGGAATTGACGGGACCCGCACAGCGTGGATGATGTGGATTATCGATGCAACGCCAACCTTACCTG
GTCTTGACATGACGGAACTCCAGAGACAGGGAGGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGCACCCCTGTCTGATTAGTGTGCTCATTTAGTGGGACT
CTAATGAGACTGCCGGTACAGAGGGTAGCCAAGGCCGAGGTGGGATGACGTCAGTCCTCATGCCCTATGACCGAGGCTTCAC
ACGTACATACAATGGTCGGTACAGAGGGTAGCCAAGGCCGAGGTGGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT
GCACTCTGCAACTCGAGTGTGATGAAGTGTGAAATCGTAGTAATCGCAGGTACGTCAGTACGCGGTGATACTGTTCCGGGT
CTTGTACACACCAGCCGTACACCATGGAGTGGGGATACCGAGAGTAGGTAGGGTAACCGCAAGGAGCCGCTACCA
CGGTATGCTTACGACTGGGT
```

Supplementary Table 15. 16S rDNA sequences (1,485 bp) of Capnocytopha sp. KCOM 2652

Sequences (5' > 3')

```
GACGAACGCTGGCGCGTGTAAACACATGCAAGTCGAACGAAGAGCGATGGAAGGCTGCTCTATCAATCTTAGTGGCG
AACGGGTGAGTAACCGTAATCACCTGCCCTCAGAGGGGACAACAGTTGAAACGACTGCTAATACCGCATACGATC
TGACCTCGGCATCGAGGATGGATGAAAGGTTGGCCTATTATAAGCTACTGAAGGAGGGATGCGGACATTGGGACTGAGAC
TAGTTGGAGGGTAACGGCCCACCAAGGCATGATCAGTAGCCGGTCTGAGAGGATGACGGCCACATTGGGACTGAGAC
ACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGAATCTTCCGCAATGGACGAAAGCTGACGGAGCAACGCCGCTGAG
TGATGACGGCCTCGGGTTGAAAGCTGTTAACGGACGAAAGGCCCTTGGCAATAGTTAGGATTGACGGTA
CCGGAAATAGAAAGCCACGGCTAACTACGTGCCAGCAGCCGGTAATACGTAGGTGCAAGCGTTGCGGAAATTATTGG
GCGTAAAGCGCGCGCAGGGATTGGTAGTCTGTTAAAAGTCCGAGTAACTGGGAGGATGGGATGGAAACTGCA
ATCTAGAGTATCGGAGAGGAAAGTGGAAATTCTCTAGTGTAGCGGTGAAATCGTAGATATTAGGAAGAACACCAGTGGCGA
AGGCAGCTTCTGGACGAAACTGACGCTGAGGCGCAGGGAGCGAACGGGATTAGATAACCCGGTAGTCCTG
GCCGTAACCGATGGTACTAGGTGAGGGTATCGACCCCTCTGCGGAGTTAACGCAATAAGTACCCGCTGG
GAGTACGACCGCAAGGTTGAAACTCAAAGGAAATTGACGGGGCCGACAAGCGGTTGGAGTATGTGTTAATTGACGC
AMCGCGAAGAACCTTACCAAGGTCTGACATTGATGGACAGAACTAGAGATAGTTCTCTCGGAAGGCCAGAACAG
GTGGTGACGGTTGCGTCGCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGAACCCCTATCTTATGTT
CCAGCACTCGGGTGGGAACTCATGAGAGACTGCGCAGACAATGCGAGGAAGGGGGATGACGTCAAATCATCATGC
CCCTTATGACCTGGCTACACAGTACTACAATGGGAGTTAAGACGGAAGCAATCCGCGAGGTTGAGCAACCCGAG
AAACACTCTCTCGGGATGCTAGGCTGCAACTCGCTACGTGAAAGTGGTAATCGCTAGTAATCGCAGGTAGCATA
TGGGTGAATAGTCCGGGCTTGTACACACCGCCGTACACCGAAAGTGGAAAGTGCCAAGCCGTGGGTA
ACCTTCGGGAGCCAGCGCTAAGGTAAGTCGATGATTGGGTT
```

Supplementary Table 16. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2653

Sequences (5' > 3')

```
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCTACTTGAACCTCGGTTGGTGGCGGACGGGTGAGTAACCGCTA
AAGAAACTTGCCCTACAGTTAGGACAACATTGGAAACGAATGCTAATACCTGATATTGATTTAGGGCATCTAAGA
TTATGAAAGCTATATGCGCTGTGAGAGAGCTTGCCTCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGGATGA
TGGTAGCCGGCTGAGAGGGTAACGGCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCAGTGGG
ATATGGACAATGGACCAAAAGTCTGATCCAGCAATTCTGTGTCAGTGAACGTTTCGGAATGTAAGTCTTCA
GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGAACGGCTAAACGTGCCAGCCGCGTAACGTATGTC
ACAAGCCTTACCGGATTATTGGCGTAAAGCGCTAGGTGGTTATGTAAGTCTGATGTGAAATGCAAGGCTAAC
TCTGTATTGCGTTGGAAACTGCATGACTAGAGTACTGGAGAGGTAACGGGAACTACAAGTGTAGAGGTGAAATTGCTAGA
TATTGTTAGGAATGCCGATGGGAAGCGCTACTGGACAGATACTGACGCTAAAGCGGAAAGCGTGGTAGCAAACA
GGATTAGATAACCTGGTAGTCCACGCCGTAACAGTATTAGGTGTTGGGGTCAACCTCAGCGCCCAAGCTAACG
CGATAAGTAACCCCTGGGAGTACGCAAGTATGAAACTCAAAGGAAATTGACGGGACCCGACAAGGGTGGAG
CATGTGGTTAATTGACGCAACCGGAGGAACCTTACCGCTTGACATCTTAGGAATGAGACAGAGATGTTCA
CCCTCGGGGAAACCTAAAGACAGGTGGTGCATGGCTGTCAGCTGTCGTGAGATGTTGGGTTAAGTCCGCAAC
GAGCGCAACCCCTTCGTATGTTACCATCTAAAGTGGGACTCATGCGATACTGCCGCGATGAGCAGGAGGAAGGTG
GGGATGACGTCAGTCATCATGCCCTTACGCTGGGCTACACAGTGTACAATGGTAGTACAGAGAGTCGCAAAGC
CGCGAGGTGGAGCTAATCTAGAAAATCTTAGTGTACTGCAACTCGAGTACATGAAGTGGAAATCG
TAGTAATCGCGAATCAGCAATGTCGCGGTAAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTT
TTGCACCTGAAGTAGCAGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTT
```

Supplementary Table 17. 16S rDNA sequences (1,464 bp) of Capnocytopha sp. KCOM 2660

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGTTGCTAATATCGACAGCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCGGCTGAGAGGATGATCCAGCCATGCCGCTGGGACTAGAGTGTGTCAGAGG GAGGTTAGAATTCCACCGTGTAGCAGTGAATGGGAGATGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACAGATGTCATT AGCTGTTGGGAACTTGATTGCTAGTACCGTGAACCGCTGGGACTGGGAGATGGGACTAGAGTGTGTCAGAGG AAACTCAAAGGAATTGACGGGGACCCGCACAAGCGGTGATGATGTGATTAATTGATGCAACCGGAAGAACCTACCT GGTCTTGACATGTACGAATCCTCCAGAGATGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGCATGGCTGTC AGCTCGTGTGAGATGTTGGGTTAAGTCCCGAACGAGCGAACCCCTGTCATTAGTTGCCATCATTAGTTGGGAC TCTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGGATGACGTCAAGTCTCATGGCCCTATGACCAGGGCTCA CACGTACATACAATGGCGGTACAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTACAAAACCGATGTCAGTCCGGG TGCACACTGCAACTCGAGTGCATGAAGTCCGAATCGCTAGTAATCGCAGGTACGTCATCTGCCGTAACGTTCCGGG TCTTGACACACCGCCGTACACCATGGAGTGGGGATACCGAAGTAGGTAGGTAACCGCAAGGAGCCGCTTACCA ACGGTATGCTTACGACTGGGTG

Supplementary Table 18. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2661

Sequences (5' > 3')
ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGTTGCTAATATCGACAGCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTCGTCTGAACCGTGGGACTAGAGTGTGTCAGAGG GAGGTTAGAATTCCACCGTGTAGCAGTGAATGGGAGATGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACAGATGTCATT AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGTACCGTGAACCGTGAACCGCTGGGAGTACGGTGCAGAGG AACTCAAAGGAATTGACGGGGACCCGCACAAGCGGTGGATGATGTGGATTAAATTGATGCAACCGGAAGAACCTACCT GTCTTGACATGTACGAATCCTCCAGAGACCGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGCATGGCTGTC GCTCGTGTGAGATGTTGGGTTAAGTCCCGAACGAGCGAACCCCTGTCATTAGTTGCCATCATTAGTTGGGACT CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGGATGACGTCAAGTCTCATGGCCCTATGACCAGGGCTTAC ACGTACATACAATGGCGGTACAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTACAAAACCGATGTCAGTCCGGATT GCACTCGCAACTCGAGTGCATGAAGTCCGAATCGCTAGTAATCGCAGGTACGTCATCTGCCGTAACGTTCCGGG CTTGACACACCGCCGTACACCATGGAGTGGGGATACCGAAGTAGGTAGGTAACCGCAAGGAGCCGCTTACCA CGGTATGCTTACGACTGGGTG

Supplementary Table 19. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2600

Sequences (5' > 3')

```

ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGTGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GTAAAGGACTTTGTCAAGGAAGAAAAGGATAGGGTTAACCCCTGCTGATGACGGTACCTGAAGAAGGCCTTGGGTT
TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACT
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGATACCGATGGCAGGGCAGCTGGGACTGAGGTTAGGTTAGAGTGTGTCAGAGG
GAGGTAGAATTCACGTGTAGCAGTGAATGGGAGGATACCGATGGCAGGGCAGCTGGGACTGAGGTTAGGTTAGAGTGTGTCAGAGG
GACTCAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGAGGATATTGCGTAAACAGGTGCTGATGGCTGTCAGAGG
GCTCTGACATGTACCGAACCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTCAGAGG
GCTCGTGTGAGATGTTGGGTTAGTCCCGCAACGAGCGCAACCCTGTCATTAGTTGCCATCTTAGTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGGCCTTATGGCAGGGCTTCAC
ACGTACATACAATGGTGGTACAGAGGTTAGCCAAGCCGGAGGTTGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACGGCCCGTACACCATGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTACATGACTGGGTG

```

Supplementary Table 20. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2601

Sequences (5' > 3')

```

ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGTGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GTAAAGGACTTTGTCAAGGAAGAAAAGGATAGGGTTAACCCCTGCTGATGACGGTACCTGAAGAAGGAAATAAGCAGG
TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGAGGATGATCCGCCACACTGGGACTGAGGTTAGGTTAGAGTGTGTCAGAGG
GAGGTAGAATTCACGTGTAGCAGTGAATGGGAGGATACCGATGGCAGGGCAGCTGGGACTGAGGTTAGGTTAGAGTGTGTCAGAGG
GACTGACGTTACATGCTCGAACGCGTGGTAGCAAACAGGATTAGATAACCGTGGTAGTCCACGCCCTAAACGATGTCAGAGG
GCTCTGACATGTACCGAACCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTCAGAGG
GCTCGTGTGAGATGTTGGGTTAGTCCCGCAACGAGCGCAACCCTGTCATTAGTTGCCATCTTAGTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGGCCTTATGGCAGGGCTTCAC
ACGTACATACAATGGTGGTACAGAGGTTAGCCAAGCCGGAGGTTGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACGGCCCGTACACCATGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTACATGACTGGGTG

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Supplementary Table 21. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2602

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACGCATGCAAGTCGAACGGCAGCACAGAGAAGCAGCTGCTTCTGGGTGGCAGTGGCG AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGCCGATATCTGATTTGGTAGCTAGCTAGGGTGGGTAAGGC CTACCAAGGCAGCATCAGTAGTGGGCTGAGAGGATGATCCGCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCCAGGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGATAGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATCGTGCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACGAAATTACTGGGCTAAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTCGCTCTGAACGGTACTGGGTACTAGAGTGTGTCAGAGG GAGGTTAGAATTCCACGTGTAGCAGTGAATGCGTAGAGATGGAGGAATACCGATGGCAGAGCAGCCTCTGGGATAA CACCGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT AGCTGTTGGGCAACTTGATTGCTTAGTACCGTAGCTAACCGGTGAAATTGACCGCCTGGGAGTACGGTCGCAAGGATTA AACTCAAAGGAATTGACGGGACCCGACAAGCGGTGGATGATGTGAGGATATTGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGTACCGAATCTCAGAGACGGAGGAGTGCCTCGGAGCGTAACACGGTGTGATGGCTGTCGTC GCTCGTGTGTCGATGAGTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAGTTGGCACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCAAGGGCTTCAC ACGTCATACAATGGTGGTAGCAGAGGTTAGCCAACCGCGAGGTGGAGCCAATCTCACAAAACCGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTATACTGGTCCCGGTT CTTGTACACACGGCCCGTACACCATGGAGTGGGGATACCAAGAAGTAGGTAGGTACCGCAAGGAGCCCCTACCA CGGTATGCTTACGACTGGGTG

Supplementary Table 22. 16S rDNA sequences (1,498 bp) of Capnocytopha sp. KCOM 2663

Sequences (5' > 3')
GGCCGCCATGGCGCCGCGGGATTGATCTCAGGTTAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAG CACAGAGAAGCTTGTCTTGGGTGGCAGTGGCAACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAA CTAATCGAAAGATTAGCTAACCGCATATTCTGAGGAAGAAAAGCAGGGGACCATTTGGCCTTGCCTGTTGAGCG CCGATATCTGATTAGCTAGTGGTGGGTAAGGCCAACCGCAGCGATCAGTAGCGGGTCTGAGAGGATGATCCGC ACACTGGGACTGAGACACGGCCAGACTCTACGGAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCC AGCCATGCCCGTGTCTGAAGAAGGCCCTGGGTGTAAGGACTTTGTCAGGGAAAGAAAAGGGGGGTTAATACCC TGTCTGATGACGGTACCTGAAGAATAAGCAGGCTAACACTACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTT AATCGAAATTACTGGCGTAAGCGGGCCAGACGGTTACTTAAGCAGGATGTGAAATCCCGGCTCAACCTGGAACT CGTCTGAACTGGGTACTAGAGTGTGTCAGAGGAGGTTAGAACACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGA TACCCCTGGTAGTCCACGCCCTAACGATGTCGATTAGCTGTGGCAGCATGACTGCTTAGTACGCAAGCTAACCGTGA AATCGACCGCCTGGGAGTACGGTCGAAGATAAAACTCAAGGAATTGACGGGGACCCGACAAGCGGTGGATGATGT GGATTAATTGATGCAACCGGAAGAACCTTACCTGGTCTGACATGACGGAACCCCTCAGAGAGACGGAGGGTGCCTCG GGAGCCGTAACACAGGTGCTGATGGCTGCGTCACTCGTGTGAGATGTTGGGTAAGTCCCGCAACGAGCGCAAC CCTTGTCTTGTAGTGGCATCATTAAGTGGGACTCTAATGAGATTGCCGTGACAAGCCGGAGGAAGGTGGGATGAGC TCAAGTCCTCATGCCCTTGACCAAGGGCTCACACGTACATAATGGCGTAGAGGGTAGCCAAGCCGAGGTG GAGCCAATCTACAAAACCGATCGTAGTCCGGATTGCACTCTGCAACTCGAGTGCATGAAGTCGGAATCGTAGTAATCG CAGGTAGCATACTCGGGTAACCGCAAGGAGCCCCTTACCGGTATGCTTACACGCCCGTACACCATGGAGTGGGGATACCAGA AGTAGGTAGGGTAACCGCAAGGAGCCCCTTACCGGTATGCTTACACGCCCGTACACCATGGAGTGGGGATACCAGA

Supplementary Table 23. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2664

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACGGAGAAGCTGCTTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCAGCATCAGTAGCGGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GTAAAGGACTTTGTCAAGGAAGAAAAGGGAAAGGGTTAATACCCCTGCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCGGCTGAGGGTAACTGGGACTGAGACACGGCCAGACTCTACGG GAGGAGAATTCCACGTGAGTGAATGGCGTAGAGATGGAGGAATACCGATGGCGAGGTAGCCTCTGGGAGTACGGTCAATT CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT AGCTGTTGGGAACTTGATTGCTAGTACCGTGAACCGGCTGAGGGTAACTGGGACTGAGACACGGCCAGACTCTACGG AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGTTAACCGATGGCGAGGTAGCCTCTGGGATAA ACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGTTAACCGATGGCGAGGTAGCCTCTGGGATAA GCTCTGACATGACGGAACTCTCAGAGACAGCGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGCGTA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACAGCGCAACCCTGTCATTAGTTGCCATCTAGTTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTAACCGTAAAGGAGCCCCTACCA CGGTATGCTTCACTGACTGGGTG

Supplementary Table 24. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2604

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAAGCTGCTTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCAGCATCAGTAGCGGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GTAAAGGACTTTGTCAAGGAAGAAAAGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCCGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGAACTGGCTCTGAACGGTACTGGTACTAGAGTGTGTCAGAGG GAGGAGAATTCCACGTGAGTGAATGGCGTAGAGATGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT AGCTGTTGGGAACTTGATTGCTAGTACCGTAGCTAACCGGTGAAATTGACCGCCTGGGAGTACGGTCAAGGTTGGGATAA ACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGTTAACCGATGGCGAGGTAGCCTCTGGGATAA GCTCTGACATGACGGAACTCTCAGAGACAGCGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGCGTA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACAGCGCAACCCTGTCATTAGTTGCCATCTAGTTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTAACCGTAAAGGAGCCCCTACCA CGGTATGCTTCACTGACTGGGTG

Supplementary Table 25. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2605

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGTTGCTCTGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCGTTATTGAGCGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCACGATCAGTAGCGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCCTGATCCAGGCTTGCGCTGTCTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTAGGGAAAGAACAGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGGC TAACTACGTGCCAGCAGCCGTAATACGTAGGGTGCAGCTGAAACTGGGACTGCGTAAACGGGCTGTGAGAGGACT GTTACTTAAGCAGGATGTGAAATCCCAGGCTCAACCTGGGACTGCGTAACTGGGACTGAGACACGGCCAGACTCCTACGG GAGGTAGAATTCCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT AGCTGTTGGGAACTTGATTGCTAGTACGGTAGCTAACCGGTGAAATTGACCGCCTGGGAGTACGGTGCAGATTAA AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGTACCGAATCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACGGTGTGCTGATGGCTGCGTCA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACAGGGCTTGCGTAACTGGGACTGAGACACGGCCAGACTCCTACGG CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCGAGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGAATACGTTCCGGGT CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCGAAGTAGGTAGGGTAACCGCAAGGAGGCCGTTACCA CGGTATGCTTATGACTGGGTG

Supplementary Table 26. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2606

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGTTGCTCTGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTCGGGCTTGCGTTATTGAGCGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC CTACCAAGGCACGATCAGTAGCGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG GAGGCAGCAGTGGGAATTTGGACAATGGCGCAAGCCTGATCCAGGCTTGCGCTGTCTGAAGAAGGCCTTGGGTT GTAAAGGACTTTGTAGGGAAAGAACAGGCTGGTAGCTAATACGACAGCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACTACGTGCCAGCAGCCGTAATACGTAGGGTGCAGCTGAAACTGGGACTGCGTAACTGGGACTGAGACACGGCCAGACT GTTACTTAAGCAGGATGTGAAATCCCAGGCTCAACCTGGGACTGCGTAACTGGGACTGAGATGTGGGATAA CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT AGCTGTTGGGAACTTGATTGCTTAGTACGGTAGCTAACCGGTGAAATTGACCGCCTGGGAGTACGGTGCAGATTAA AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACCGCAAGAACCTTACCTG GTCTTGACATGTACCGAATCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACGGTGTGCTGATGGCTGCGTCA GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACAGGGCTTGCGTAACTGGGACTGAGCTCAAGTCCTCATGCCCTATGACCGAGGCTTCAC CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCGAGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGAATACGTTCCGGGT CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATGCCAGAAGTAGGTAGGGTAACCGCAAGGAGGCCGTTACCA CGGTATGCTTATGACTGGGTG

Supplementary Table 27. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2607

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTGCTTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTTCGGGCCTGCGTTATTGAGGGCCGATATCTGATTAGCTAGCTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTCGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGCTAATCGACAGCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACGAAATTACCGGCTGAAGCAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGAGGAGATGACGGTACCTGAAGGTTGACTAGAGTGTGAGG GAGGTTAGAATTCCACGTGAGGATGACGGTACCTGGGACTGAGGAGATACCGGATGCCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT AGCTGTTGGGAACTTGATTGCTAGTACCGTGAACGGCTGGGACTGAGGAGATGACGGTACCTGAAGGTTGACTAGAGTGTGAGG AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGATATTGACCGCCTGGGAGTACGGTGCATGGCTGCGTAAGGATTAA ACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGATATTGACCGCCTGGGAGTACGGTGCATGGCTGCGTAAGGATTAA GCTCTGACATGACGGAACTCTCAGAGACAGCGAGGAGTGCCTGGGAGCGTAACACAGGTGCTGATGGCTGCGTA GCTCGTGTGAGGATGTTGGGTTAAGTCCCGCAACAGCGCAACCCCTGTGATTAGTTGACCGCCTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGGCCTTATGACCGAGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGTTAGCCAAGCCGGAGGAGGCAATCTCACAAAACGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCTGAACTCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTAACCGCAAGGAGGCCCTACCA CGGTATGCTTATGACTGGGTG

Supplementary Table 28. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2609

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTGCTTCTGGGTGGCGAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT GAGGAGGAAAGCAGGGGACCTTCGGGCCTGCGTTATTGAGGGCCGATATCTGATTAGCTAGCTGGTGGGTAAAGGC CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTCGGGTT GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATACGTGCCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACGAAATTACTGGGCTGAAGCGAGCGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACGGTACTGGTACTAGAGTGTGAGG GAGGTTAGAATTCCACGTGAGGATGACGGTACCTGGGACTGAGGAGATACCGGATGCCGAAGGCAGCCTCTGGGATAA CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT AGCTGTTGGGTAACCTGATTGCTAGTACCGTAGCTAACCGGTGAAATTGACCGCCTGGGAGTACGGTGCAGGATTAA ACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGAGGATATTGACCGCCTGGGAGTACGGTGCAGGATTAA GCTCTGACATGACGGAACTCTCAGAGACAGCGAGGAGTGCCTGGGAGCGTAACACAGGTGCTGATGGCTGCGTA GCTCGTGTGAGGATGTTGGGTTAAGTCCCGCAACAGCGCAACCCCTGTGATTAGTTGACCGCCTGGGACT CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGGCCTTATGACCGAGGCTTCAC ACGTCACTACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGAGGCAATCTCACAAAACGATGTCAGTCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCTGAACTCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTAACCGCAAGGAGGCCCTACCA CGGTATGCTTATGACTGGGTG

Supplementary Table 29. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2610

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACGGTACTGGGTACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTAGTACCGTGAACGGCTGGGACTGGGAGTACCGATGGCTGCAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGTACCGAATCTCAGAGACGGAGGAGTGCCTCGGGAGCGTAACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCTTAGTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCGAGAAGTAGGTAGGTAAACCGCAAGGAGCCGCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 30. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2639

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGACAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACGGTACTGGGTACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGCTAACCGTGAACGGCTGGGACTGGGAGTACGGTGCAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGTACCGAATCTCAGAGACGGAGGAGTGCCTCGGGAGCGTAACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCTTAGTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGGGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCGAGAAGTAGGTAGGTAAACCGCAAGGAGCCGCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 31. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2655

Sequences (5' > 3')

```

ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGAACGCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTCCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGCGTCAAGTGGGACTGAGCTGACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATCCGAGGGTAAACCGATGGCAGGGCAGCCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTAGTACCGTAGGCTAACCGGCTGGGAGTACCGAATTACTGGGCTAAAGCGAGCGCAGACG
AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGGGAGGTGCCTTGGGAGCGTAACACAGGTGCTGATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTGTCAATTAGTTGCCATCTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTGGTAGCAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGAGTGGGGATACCGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 32. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2656

Sequences (5' > 3')

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ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGAACGCTGATCCAGCCATGCCGCTGTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTCCAGCAGCCGGTAATCGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGCGTCAAGTGGGACTGGTGAAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATCCGATGGCAGGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGTACCGTAGGCTAACCGTGAAGTGGGACTGAGCTGCAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGGGAGGTGCCTTGGGAGCGTAACACAGGTGCTGATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTGTCAATTAGTTGCCATCTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTGGTAGCAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGAGTGGGGATACCGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 33. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2611

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGTTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTTCTGGGTGGCAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCAGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAGGC
CTACCAAGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTCCAGCAGCCCGTAATCGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTCGCTCTGAACACTGGGACTAGAGTGTGTCAGAGG
GAGGAGAATTCACGTGAGTGAATGGGAGGAGATGGGAGGAAACCGATGGCAGGGCAGCCTCTGGGATAA
CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGCAACTTGATTGCTAGCGTAGCTAACCGCTGGGATGACCGCCTGGGAGTACGGTCGAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGTACCGAATCTCAGAGACAGGGAGGTGCCTTGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCTTAGCTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGTAGCCAACGCCGAGGTGGAGCCAATCTCACAAAACGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTT

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Supplementary Table 34. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2612

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGTTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTTCTGGGTGGCAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCAGGGCTTGCCTTATTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAGGC
CTACCAAGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTCCAGCAGCCCGTAATCGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTCGCTCTGAACACTGGGACTAGAGTGTGTCAGAGG
GAGGAGAATTCACGTGAGTGAATGGGAGGAGATGGGAGGAAACCGATGGCAGGGCAGCCTCTGGGATAA
CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGCAACTTGATTGCTAGCGTAGCTAACCGCTGGGATGACCGCCTGGGAGTACGGTCGAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGGAAGAACCTTACCTG
GTCTTGACATGTACCGAATCTCAGAGACAGGGAGGTGCCTTGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCTTAGTTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGGTAGCCAACGCCGAGGTGGAGCCAATCTCACAAAACGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTT

```

Supplementary Table 35. 16S rDNA sequences (1,488 bp) of Capnocytopha sp. KCOM 2618

Sequences (5' > 3')

```
GACGAACGCTGGCGCGTGTAAACACATGCAAGTCGAACGAAGAGCGATGGAAGGCTGCTCTATCAATCTTAGTGGCG
AACGGGTGAGTAACCGTAATCACCTGCCCTTCAGAGGGGACAACAGTTGAAACGACTGCTAATACCGCATACGATC
TGACCTCGGCATCGAGGATAGATGAAAGGTGGCCCTATTATAAGCTATCACTGAAGGAGGGATTGGCTCTGATTAGC
TAGTTGGAGGGTAACGGCCCACCAAGGCATGATCAGTAGCCGGTCTGAGAGGATGAACGGCCACATTGGACTGAGAC
ACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGAATCTTCCGCAATGGACGAAAGCTGACGGAGCAACGCCGCTGAG
TGATGACGGCCTCGGGTTGAAAGCTGTTAACGGACGAAAGGCCCTTGGCAATAGTTAGAAGGATTGACGGTA
CCGGAAATAGAAAGCCACGGCTAACTACGTGCCAGCAGCCGGTAATACGTAGGTGCAAGCGTTGCGGAAATTATTGG
GCGTAAAGCGCGCGCAGGGATTGGTCAGTCTGTTAAAAGTCCGAGTAACTGGGATGGGCTTAACCCGTATGGGATGGAACTGCCA
ATCTAGAGTATCGGAGAGGAAAGTGGAAATTCTCTAGTGTAGCGGTGAAATCGTAGATATTAGGAAGAACACCAGTGGCGA
AGGCAGCTTCTGGACGAAACTGACGCTGAGGCGCAGGGAGCGAACGGGATTAGATAACCCGGTAGTCCTG
GCCGTAACCGATGGTACTAGGTGAGGGTATCGACCCCTCTGCGGAGTTAACGCAATAAGTACCCGCTGG
GAGTACGACCGCAAGGTTGAAACTCAAAGGAAATTGACGGGGCCGACAAGCGGTTGAGTATGTTAATTGACGC
AACCGCAAGAACCTTACCAAGGTCTGACATTGATGGACAGAACTAGAGATAGTTCTCTCGGAAGGCCAGAACAG
GTGGTGCACGGTTGTCGTAGCTCGTGTGAGATGTTGGGTTAAGTCCGCAACCGAGCGAACCCCTATCTTATGTTG
CCAGCACTCGGGTGGGAACTCATGAGAGACTGCCGAGACAATGCCGAGGAAGGCCGAGTGACGTCATACTCATGC
CCCTTATGACCTGGCTACACAGTACTACAATGGGAGTTAATAGACCGAAGCAATACCGCAGGTTGAGCAACCCGAG
AAACACTCTCTCGGTGATGAGCTGCAACTGCCCTACGTGAAAGTCGAATCGTAGTAATCGCAGGTAGCATAC
TGGGTGAATAGTCCGGGCTTGTACACACCGCCGTCACACCAGAAAGTCGAAGTGCCAAGCCGTTGGGTAAG
ACCTTCGGGAGCCAGCGCTAAGGTAAGTCGATGATTGGGTGAAG
```

Supplementary Table 36. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2620

Sequences (5' > 3')

```
ATTGAAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATATCGGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGGACCTTCGGGCTTCGCGTTATCGAGCGGCCGATATCTGATTAGCTAGTTGGTGGGTAAGGC
CTACCAAGGCAGCATCAGTAGCGGTCTGAGAGGATGATGCCACACTGGGACTGAGACACGCCAGACTCTACGG
GAGGCAGCAGTGGGAAATTGGACAATGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCCTGGGTT
GTAAAGGACTTTGTCAGGGAGAAAAGGATAGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCAGCGC
TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAATCGGAATTACTGGGCTAAAGCGAGCGAGAC
GTTACTTAACGAGATGTGAAATCCCCGGCTCAACCTGGAACTGCCCTGAACGGTACTGGGTGACTAGAGTGTCTAGAGG
GAGGTAGAATCCACGTGAGCTGAAATCGTAGAGATGTGGAGGAATCCGATGCCGAAGGCAGCCTCTGGATAA
CACTGCCGTTCATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCCCTGGTAGTCCACGCCCTAAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGCTAGCGTAGCTACCGCTGAAATTGACCCTGGGAGTACGGTCGCAAGGTTAA
ACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTTGAGTATTCGATGCAACCGGAAGAACCTTACCTG
GTCTGACATGACGGAACTCTCCAGAGACCGGAGGATGCCCTCGGGAGCGTAACAGGTGCTGCATGGCTGCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGCAACCCCTGTCTGATTAGTGCATCTGTTGGGACT
CTAATGAGACTGCCGGTACAGAGGGTAGCCAAGCCCGAGGAGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTAC
ACGTACATGACGGTACAGAGGGTAGCCAAGCCCGAGGAGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTAC
GCACTTGCAACTCGAGTGCATGAAAGTCGGAATCGTAGTAATCGCAGGTAGCATACTGCCGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCACACCATGGGAGTGGGGATACCGAGTAGGTAGGGTAACCGCAAGGAGCCGTTACCA
CGGTATGCTCATGACTGGGT
```

Supplementary Table 37. 16S rDNA sequences (1,395 bp) of Capnocytopha sp. KCOM 2566

Sequences (5' > 3')
GTCGGACGGCAGCACAGAGAAGCTGCTTGGTGGCGAGTGGCGAACGGGTGAGTAACATATCGGAACGTACCGAGC AGTGGGGATAACTAATCGAAAGATTAGCTAATACCGCATTTCTGAGGAAGAAGCAGGGACCTTGGGCCTTCGC TGTTTGGCGCCGATATCTGATTAGCTAGTGGTGGGTAAGGCCATCCAAGGCGACGATCAGTAGCGGGCTGAGAG GATGATCCGCACACTGGGACTGAGACACGGCCCAGACTCTACGGGAGGCAGCAGTGGGAATTGGACAAGGGCG AAGCCTGATCCAGCCATGCCGCTGCTGAAGAAGGCCCTGGGTTGTAAGGACTTTGTCAGGGAAAGAAAAGGGCG GTTAATACCCCTGTCGATGACGGTACCTGAAGAATAAGCACCGGCTAACATCGTGGCAGCAGCCGCGTAATACGTAG GTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGGGCGCAGACGGTTACTTAAGCAGGATGTGAAATCCCCGGCTCA ACCTGGGAACGTGCTCTGAACGGTGGGACTAGAGTGTGTCAGAGGGAGGAGAATTCCACGTGAGCAGTGAATGCGT AGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTGGGATAACACTGACGTTATGCCGAAAGCGTGGTAGCAA ACAGGATTAGATAACCCCTGGTAGTCCACGCCCTAACAGATGCGATTAGCTGTTGGCAGCATGACTGCTTAGCGAAG CTAACCGCTGAAATCGACCCCTGGGAGTACGGTGCAGAAGACCTAACAGGATTGACGGGACCCGACAAGCG GTGGATGATGTGGATTAAATCGATGCAACCGAAGAACCTAACCTGGCTTGCACATGACGGAAACCCCTCAGAGACGGAG GGGTGCCTCCGGAGCGTAACACAGGTGCTGCGATGGCTGTCGTCAGCTGTCGAGATGTTGGGTAAGTCCCGCA ACGAGCGCAACCCCTGTATTAGTGCATCATTAAGTGGCAGCTAATGAGACTGCCGTGACAAGCCGGAGGAAGG TGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTCACACGTGATACATGGTCGGTACAGAGGGTAGCCAA GCCGCGAGGGTGGAGCCAATCACAACCGATGCTAGTCCGGATTGCACTCTGCAACTCGAGTCAGTGAAGTCGAATC GCTAGTAATCGCAGGTCACTGCGGTGAATACGTTCAACTAGTGAATTGCGGGCGCTGCGAGTCGACCAT ATGGGAGAGCTCCACCGCTGGATGCGATAGCTT

Supplementary Table 38. 16S rDNA sequences (1,464 bp) of Capnocytopha sp. KCOM 2642

Sequences (5' > 3')
ATTGAAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAAGCTGCTTGGTGGCGAGTGGCG AACGGGTGAGTAATATATCGGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT GAGGAGGAAAGCAGGGACCTTCGGGCCTGCGTTATCGAGCGGCCGATATCTGATTAGCTAGTGGTGGGTAAGGC CTACCAAGGCGACGATCAGTAGCGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCCAGCCATGCCGCTGCTGAAGAAGGCCCTGGGTT GTAAAGGACTTTGTCAGGGAGAAAAGCTGTTGCTAATACCGACAGTTGATGACGGTACCTGAAGAATAAGCAGCG TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAATCGGAATTACTGGCGTAAGCGAGCGAGCAG GTTACTTAACCGAGATGTGAAATCCCCGGCTCAACCTGGGACTCGTCTGAACGGTACTGGTACTAGAGTGTGAGG GAGGTAGAATTCACGTGAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTGGGATGA CACTGACGTTATGCTCGAACCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAAACGATGTCATT AGCTGTTGGGAACTTGATTGCTTAGCTAGCGTAGCTAACCGTGAATTGACCGCCTGGGAGTACGGTCGCAAGATTA AAACTCAAAGGAATTGACGGGACCCGACAAGCGGTGGATGATGTGGATTACCGATGCAACCGGAAGAACCTTACCT GGTCTGACATGTACGGAATCCTCCARAGACGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGATGGCTGTC AGCTCGTGTGAGATGTTGGTTAAGTCCGCAACGAGCGAACCCCTGTCATTAGTGGCATCATTAAGTGGGAC TCTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGAGTACGTCAGTCAAGTCCATGCCCTATGACCAGGGCTCA CACGTCATACAATGGCGGTACAGAGGGTAGCCAAGCCGAGGCGAGGCAATCTACAAAACCGATGCTAGTCCGGAT TGCACTCTGCAACTCGAGTGCATGAAGTCCAATCGCTAGTAATCGCAGGTCACTGCGGTGAATACGTTCCGGG TCTTGTACACACCGCCGTACACCATGGAGTGGGGATACCAGAAGTAGGTAGGGTAACCGCAAGGAGCCGCTTAC ACGGTATGCTCATGACTGGGTG

Supplementary Table 39. 16S rDNA sequences (1,464 bp) of Capnocytopha sp. KCOM 2657

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTCGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGCTTAATACCGACAGTGTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGAAATTACTGGCGTAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGTTAGAATTCCACGTGTAGCAGTGAATGGCGAGAGATGGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCAATT
AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGCTAACGAAATTGACCGCCTGGGAGAGTACGGTCGAAGGATTA
AAACTCAAAGGAATTGACGGGGACCCGACAAGCGGTGATGATGTGATTAATTGATGCAACGCGAAGAACCTACCT
GGTCTTGACATGTACGAATCCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGCATGGCTGTC
AGCTCGTGTGTCGAGATGTTGGGTTAAGTCCCGAACGAGCGAACCCCTGTCTTAGTGTGACATTAAGTGGGAC
TCTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGGATGACGTCAAGTCTCATGGCCCTATGACCAGGGCTCA
CACGTACATACATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGCGAACATCTACAAAACCGATGTAGTCCGGAT
TGCACACTGCAACTCGAGTGCATGAAGTCCGAAATCGCTAGTAATCGCAGGTAGCATCTGCCGGTAACCGCAAGGAGCCCCTTAC
ACGGTGTGCTTATGACTGGGTG

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Supplementary Table 40. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2623

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTCGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGTTGCTTAATACGACAGCTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGAAATTACTGGCGTAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACACTGGGACTGAGAGTGTGTCAGAGG
GAGGTTAGAATTCCACGTGTAGCAGTGAATGGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCAATT
AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGCTAACCGTAGGAAATTGACCGCCTGGGAGTACGGTCGCAAGGATTA
AACTCAAAGGAATTGACGGGGCCCGACAAGCGGTGGATGATGTGGGATAATTGACATGCAACGCGAAGAACCTACCT
GTCTGACATGTACGGAATCCTCCAGAGACGGAGGAGTGCCTCGGGAGCGTAACACAGGTGCTGCATGGCTGTC
GCTCGTGTGAGATGTTGGGTTAAGTCCCGAACGAGCGAACCCCTGTCTTAGTGTGACATGGCTGTC
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGAGTACGTCAGTCAGTCCCTATGACCAGGGCTC
ACGTACATACATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGCGAACATCTACAAAACCGATGTAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCCGAAATCGCTAGTAATCGCAGGTAGCATCTGCCGGTAACCGCAAGGAGCCCCTTACCA
CTTGTACACACCGCCCGTACACCATGGGAGTGGGGATACCGAGAAGTAGGTAGGGTAACCGCAAGGAGCCCCTTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 41. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2624

Sequences (5' > 3')

```

ATTGAACGCTGGCGCACGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGTAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTCGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGTTGCTAATACCGACAGTGTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTGCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGAAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGCGTCAAGTGGGACTGAGACACGGCCAGACTCTACGG
GAGGTTAGAATTCCACGTGAGTGAATGGCGTAGAGATGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CGCTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTAGTACCGTAGGCTAACGCGTAAACGCGCTGGGAGTACGGTCAAGGATGTCAGG
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAATTCGATGCAACGCGAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGCGAGGTGCTTGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAAGTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGTAGCCAAGCCGGAGCGGAATCTCACAAAACCGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCGCTACCA
CGGTATGCTTACATGACTGGGTG

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Supplementary Table 42. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2625

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCTCGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGCTGTTGCTAATACCGACAGTGTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACATCGTGCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGAAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACACTGGGTGACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCCACGTGAGTGAATGGCGTAGAGATGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTAGTACCGTAGCTAACCGTAGGCTAACGCGTAAACGCGTAAACGCGTCAAGGATGTCAGG
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAATTCGATGCAACGCGAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGCGAGGTGCTTGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAAGTGGGACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGCGGAATCTCACAAAACCGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGAGTGGGGATACCAAGAAGTAGGTAGGTAAACCGCAAGGAGCCGCTACCA
CGGTATGCTTACATGACTGGGTG

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Supplementary Table 43. 16S rDNA sequences (1,461 bp) of Capnocytopha sp. KCOM 2567

Sequences (5' > 3')
ATTGACGCTGGCGCAGGCTTAACACATGCAAGTCGAACGGTAACAGGTAACTGTACTTATGCTGACGAGTGGCG GACGGGTGAGTAATGCTGGGATCTGGCTTATGGAGGGGATAACGACGGAAACTGTCGCTAACCGCGTAGAATCG GGAGATGAAAGTGTGGGACCTCGGGCACATGCCATAGGTGAACCCAAGTGGGATTAGGTAGTTGGTGGGTATGGC CTACCAAGCCGACGATCTCTAGCTGGTCTGAGAGGTGACCAGCCACACCGGACTGAGACACGGCCGACTCTACGG GAGGCAGCAGTGGGAATATTGCGCAATGGGGCAACCTGACGCAGGCCATGCCGCTGAATGAAGAAGGCCTCGGGTT GTAAAGTTCTCGGTGACGAGGAAGGTTGTTAATAGCGCAACGAATTGACGTTAACAGAAGAAGCACCCTG AACTCCGTGCCAGCAGCCGGTAATACGGAGGGTGCAGGCTTAATCGGAAACTGGGCTAACGGCAGGGCTGGGATG ACTTTAACGGTGTGAAATCCCCTGGGCTTAACCTGGGAAATTGCAACTGGGCTAACGGGCTGGGATG GGGTAGAATTCCACGTGTAGCGTGAATGGGAGATGTGGAGGAACCGAAGGCGAAGGCAGCCCTGGGATG ACTGACGCTCATGTGCGAAACGGTGGGGAGCAAACAGGATTAGATAACCTGGTAGTCCACGCTGAACGCTGTG GGGATTGTGCTTGAGCTGGTGCCTGAGCTAACCGCCTGGGAGTACGGCAGGGCTGGGATG TCGAATGAATTGACGGGGCCGCACAAGCGTGGAGCATGTGGTTAATCGATGCAACGCGAAGAACCTTACCTACTC TTGACATCCATGGAATCTTGAGAGATATGAGAGTGCCTCGGGAAACCATGAGACAGGTGCTGCATGGCTG CGTGGTAGAATGGGTAAAGTCCCGCAACGAGCGCAACCCCTATCCTTGTGAGCTGAGTGGGCTGGGACTCA AAGGGGACTGCCGGTGTAAACCGGAGGAAGGTGGGATGACGCTAACGTCATCATGCCCTACGAGTAGGGCTACACAC GTGCTACAATGGGTATAACAGGGCGACAAGCGCGAGGTGGAGTGAATCTCAGAAAGTACGCTAAGTCCGGATTGG AGTCTGCAACTCGACTCCATGAAGTCGGATCGTAGTAATCGGAATCAGAATGTCGGGTGAATACGTTCCGGGCT TGTACACACCGCCGTACACCATGGAGTGGGTTGACCAAGTAGATAGCTAACCGCAAGGGGGCGTTACCACG GTATGATTGACTGAGGTG

Supplementary Table 44. 16S rDNA sequences (1,462 bp) of Capnocytopha sp. KCOM 2568

Sequences (5' > 3')
ATTGACGCTGGCGCAGGCTTAACACATGCAAGTCGAACGGTAACAGGTAACTGTACTTATGCTGACGAGTGGCG GACGGGTGAGTAATGCTGGGATCTGGCTTATGGAGGGGATAACGACGGAAACTGTCGCTAACCGCGTAGAATCG GGAGATGAAAGTGTGGGACCTCGGGCACATGCCATAGGTGAACCCAAGTGGGATTAGGTAGTTGGTGGGTATGGC CTACCAAGCCGACGATCTCTAGCTGGTCTGAGAGGTGACCAGCCACACCGGACTGAGACACGGCCGACTCTACGG GAGGCAGCAGTGGGAATATTGCGCAATGGGGCAACCTGACGCAGGCCATGCCGCTGAATGAAGAAGGCCTCGGGTT GTAAAGTTCTCGGTGACGAGGAAGGTTGTTAATAGCGCAACAAATTGACGTTAACAGAAGAAGCACCCTG TAACCCGTGCCAGCAGCCGGTAATACGGAGGGTGCAGGCTTAATCGGAAACTGGGCTAACGGCAGGGCTGGGACT GACTTTAACGGTGTGAAATCCCCGGCTTAACCTGGGAAATTGCAATTGCAACTGGGCTAACGGCAGGGCTGGGACT GGGTAGAATTCCACGTGTAGCGTGAATGGGAGGAACCGAGGATTAGATAACCTGGTAGTCCACGCTGAACGCTGTG TACTGACGCTCATGTGCGAAACGGTGGGGAGCAAACAGGATTAGATAACCTGGTAGTCCACGCTGAACGCTGTG GGGGATTGTGCTTGAGCTGGTGCCTGAGCTAACGTGATAATCGACCCGCTGGGAGTACGGCGAACGGTAAAA CTCAATGAATTGACGGGGCCCGACAAGCGGTGGAGCATGTGGTTAACCGTGAACGCGAAGAACCTTACCTACT CTTGACATCCATGGAATCTTGAGAGATATGAGAGTGCCTCGGGAAACCATGAGACAGGTGCTGCATGGCTG TCGTGGTAGAATGGGGTTAACCGTGCACGGGAAACCGGAGGAGGTGGGATGACGCTAACGTCATCATGCCCT AAAGGAGACTGCCGTGATAACCGGAGGAAGGTGGGATGACGCTAACGTCATCATGCCCTAACGAGTAGGGCTACACA CGTGCCTACAATGGGTATAACAGGGCGACAAGCGCGAGGTGGAGTGAATCTCAGAAAGTACGCTAAGTCCGGATTG GAGTCTGCAACTCGACTCCATGAAGTCGGAAATCGCTAGTAATCGGAATCAGAATGTCGGGTGAATACGTTCCGGGCT TGTACACACCGCCGTACACCATGGAGTGGGTTGACCAAGTAGATAGCTAACCGCAAGGGGGCGTTACCAC GGTATGATTGACTGGGGTG

Supplementary Table 45. 16S rDNA sequences (1,436 bp) of Capnocytopha sp. KCOM 2569

Sequences (5' > 3')
CACCCAGTCGTGATTCCACTGTGGAGGGTAGCGAATTGCATTCCGCTTCGAGTGAAATCAACTCCATGGTGTGA CGGGCGGTAGATAAGACCCGGAACGTATTACCGTAGCATGGCTATCGCAGTACTAGCATTAGCGATTCCGGTTATGG AGTCGAGTTGCAGACTCCAATCGAATCGGACATATTAGTTGCTCATCTCGCAGTATTGCGTCTATTGTAT ATGCCATTGAGCAGCTGGCCGGACATAAGGGCATGATGACTTGCACGTCACACCTCCTCCTCCTACG AAGGCAGTCTCATTAGAGTCTGGCCGAACCGTAGCAACTAATGACGTGGGTTGCCTCGTTGCGGACTTAACCCAA CATCTCACGACAcGAGCTGACGACAGCGTGCAGCACCTGCTTAACATTCTGCAAGCAGACACTTCCATCTCGGA TGAGTTGTTAGATATCAAGTCCGGGTAAGGTTCTCGCTATTCGAATTAAACCACATGCTCCACCGCTGTGCGGGT CCCCGTCTATTCTTGAGTTAATCTGCAACCGTACTCCTCCAGGGTATACTTAATCGTTAGGTGATTACTGC CGTACTAGCACGACAACACCGGTATACATGTTAGGGCTGGACTACCCAGGGTATCTAATCTGTTGCTCCCACG CTTCACGCATTAGCGTCAAGTCCAGCAGATCGCTCGCAATAGGTATTCTTGTATACGGATTAC CCTACACCAAGAATTCCATCGCTCCCTACTCTAGATTATCAGTTCCAAGCAGTTAACGTTGAGCCGTTAGA TTTCACAAGAGACTTGATAATCCGCTACGCGTCTTACGCCAGTATTCCGAGTAACGCTTGACCCCTCGTATTAC CGCGGCTGCTGGCACGGAGTTAGCCGGTCTTACGTTAGGTACCGTCTTACGCCAGTATTCCCTAACAAAGGAGTTACGC TCCGAAAGTGTCACTCCACCGCGCTTGCTGGTCAAGGTTCCCTACTGCGCAATATTCCCTACTGCTGCTCCC GTAGGAGTTGGACCGTGCTCAGTTCAATGTACTGATCATCTCAGACCAGTACGCGTCAAGCCTCGTAGGC CGTTACCCACCGACTAGCTGATACGATAAGTCTACCCCTGCCGAAATTCTCCGATTATCTTATGGTAAAAG GAGTATGGAGTATTAGCAGTCATTCTAAGTGTGCTCCAGCAAGGGCAGATTAGCTATATATTACTTACCGTGC CCACTAAATTAAAGAGCAAGCCTTAAATTCCGTTGACTTGATATTAGGCACGCCAGCGTTACT

Supplementary Table 46. 16S rDNA sequences (1,462 bp) of Capnocytopha sp. KCOM 2570

Sequences (5' > 3')
ATTGAAACGCTGGCGCAGGCTTAACACATGCAAGTCACAGGTAAACAGGTAAAGTACTTGTACTTATGCTGACGAGTGGCG GACGGGTGAGTAATGCTGGGGATCTGGTTATGGAGGGGATAACGACGGAAACTGTCGTAATACCGCGTAGAACATCG GGAGATGAAAGTGTGGGACCTCGGGCACATGCCATAGGTGAACCCAAAGTGGGATTAGGTAGTTGGTGGGTATGGC CTACCAAGCCGACGATCTCTAGCTGGTCTGAGAGGGTGAACCGAGCCACACCGGGACTGAGACACGGCCGGACTCTACGG GAGGCAGCAGTGGGAATATTGCGCAATGGGGCACCCCTGACGCAGCCATGCCGCTGAATGAAGAAGGCTTGGGTT GTAAAGTTCTTGGTGACGAGGAAGGTTGTTGTTAATAGCGCAACAAATTGACGTTAATCAGAAGAAGCAGCCG TAACTCCGTGCCAGCAGCCGGTAATACGGAGGGTGCAGCGTTAATCGGAAATACTGGCGTAAGGGCACGCCAGCG GACTTTAAGTGAGGTGTGAAATCCCCGGCTTAACCTGGGATTGCAATTGCAACTGGCGTAAAGGGCACGCCAGCG GGGGTAGAATTCCACGTGACGGTGAATGCGTAGAGATGTGGAGGAATCCGAAGGGCACGCCCTGGGAATG TACTGACGCTCATGTGCGAAAGCGTGGGAGCAAACAGGATTAGATAACCTGGTAGTCCACGCTGAAACGCTGTCGATT TGGGATTGCTTGGTAGCTGGTGGCCGTAGCTAACGTGATAATGCCGCTGGGAGTACGGCGCAAGGTTAAAA CTCAATGAATTGACGGGGCCCGCACAAGCGGTGGAGCATGTTAATCGATGCAACGCGAAGAACCTTACTACT CTTGACATCCATGGAATCTTGTAGAGATATGAGAGTGCCTCGGAACCATGAGACAGGTGCTGATGGCTGTCGTCAGC TCGTGTTGTGAAATGTTGGGTTAAGTCCGCAACGAGCGCAACCCATTACCTTGTGCTGGCAGCGATTGGTGGGAACTC AAAGGAGACTGCCGTGATAACCGGAGGAAGGTGGGATGACGTCAAGTCATCATGCCCTACGAGTAGGGTACACA CGTGCCTACAATGGCGTACAGAGGGCAGCGAAGCCGAGGTGGAGTGAATCTCAGAAAGTACGCTAAGTCCGGATTG GAGTCTGCAACTCGACTCCATGAAAGTGGAGTGAATCGCTAGTAATCGCAATCAGAAATGTCGCGGTAAACGTTACCG TTGTACACCCCGCGTACACCATGGGAGTGGGTTGTAACAGAAGTAGATAGCTTAACCGCAAGGGGGCGTTACCAC GGTATGATTGACTGGGGTG

Supplementary Table 47. 16S rDNA sequences (1,622 bp) of Capnocytopha sp. KCOM 2571

Sequences (5' > 3')

```
CACCCCAGTCGCTGATTCCACTGTGGACCATAACCGGTTGGTATTTGGGCTCGAGTGAAATCAACTCCATGGTGTGA
CGGGCGGTGAGTACAAGACCGGAAACGTATTCAACGTAGCATGGCTGATCTACGATTACTAGCGATTCCGGCTTCATGG
AGTCGAGTTGCAGACTCCAATCCGAACTGGGACGTATTATAGATTGTCATCTCGGATATTGCGTCTATTGTAT
ACGCCATTGTAGCACGTGTCGCCCCGACATAAGGGCATGATGACTTGACGTCGCCCCACACCTTCCTCTCCTTACG
AAGGCAGTCTCATTAGAGTGTGCGCTAACCGTTAGCAACTAATGACGTTGGGTTGCGCTCGTTGGGACTTAACCCAA
CATCTCACGACACGAGCTGACGACAGCGTGCAGCACCTGCTTAACATTCTGCAAGCAGACACTTCCATCTGG
TGATTGTTAGATATCAAGTCCGGTAAGGTTCTCGCTATCTCGAATTAAACCATGCTCCACCGCTGTGCGGT
CCCCGTCTATTCTTGAGTTTAATCTTGCACCGTACTCCCAGGGGTATACTTAATCGTTAGGTGCAATTACTGCC
TCGACTAGCGAAGCAACAACAGTATACATCGTTAGGGCGTGGACTACCAGGGTATCTAATCTGTTGCTCCCACGC
TTTACCGCATTAGCGTCAGTTAACGTTAGCAGATCGCTTGCATGGGTTATTCTTGTATCTACGGATTTACCC
CTACACCAAGAATTCCATCTGCCTCTCCCTACTCTAGATTATCAGTTTCCAAGCAGTTAACGGTTAACGGTAGAT
TTCACAAGAGACTTGATAATCCGCCTACCGCTCTTACGCCAGTGATTCCGAGTAACGCTTGACCCCTCGTATTACC
GGGGCTGCTGGCACGGAGTTAGCCGGTGTCTTACCGTCTACCGTCTACCGGTTCCCCATTGAGCAATATTCCCTACTGCTGCC
CCGAAAGTGTCTCCACCGCGCGTTGCTCAGGGTTCCCCATTGAGCAATATTCCCTACTGCTGCC
TAGGAGTCTGGACCGTGTCTCAGTTAACGTTAGCTGACTGATCATCCTCTAGACCGAGTTACGCGTCTAGCCTGGTAGGC
GTTACCCCTACCAACTAGCTGATACGATATAGCCTCATCTACACCGAAAAAAATACATTGCAAGATTCTGACAAA
TACGGACTTCGAGAAAGGCAAAGCCTTCTTGCAGACAAGAAGCGCAAGCGCTCCCTGACCCACCTAACGACACCGA
TGTTTGCACATCGCGTATCAATTAGTTGTTACGCCATATCTCAAGATGAAACAAAAAGCAAAATTATTAA
CTTCCCGACTAACGTTATGCTTAGAGGAGTATAGAGTATTAGCAGTGTCTAACGTTGCTCTAGTGTAGGGCA
GATTAGCTATATATTACTCACCGTGCGCCACTAACGATTAAGCAAGCTACTTAATCTCGTCTGACTTGATGTATT
AGGCACGCCGCCAGCGTTCACT
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Supplementary Table 48. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2626

Sequences (5' > 3')

```
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAAGCTGCTTCTGGGTGGCAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT
GAGGGAGGAAAGCAGGGGACCTCGGGCTTGCCTATTGAGCGGCCATCTGATTAGCTAGTTGGTGGGTAAGGC
CTACCAAGGGCAGCATCAGTACGGGCTGAGAGGATGATCCGCCACACTGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCCAGGATGCGCTGTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAAAAAAGGACAGGGTTAACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCGC
TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGGAATTACTGGCGTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAAATCCCGGCTAACCTGGAACTCGCTCTGAACGGTACTAGAGTGTGTCAGAGG
GAGGAGTAAATTCCACGTGAGCAGTGAATGCGTAGAGATGTTGGAGGAATACCGATGGCGAAGGCAGCCTCTGGATAA
CACTGACGTTCATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGCGTAGCTAACCGTGAATTGACCGCCTGGGAGTACGGTCGAAGATTAA
AACTCAAAGGAATTGACGGGACCCGACAAGCGTGGATGATGTTGATTAACTCGATGCAACGCGAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCCAGAGACGGAGGAGTGCCTTGGGAGCGTAACACGGTGTGCTGATGGCTGCGTCA
GCTCGTGTGAGATGTTGGGTAAGTCCCGCAACGAGCGCAACCCCTGTCTTGGGAGGAGTACGGTCGAAGATTAA
CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTTGGGAGTACGTCAGTCAAGTCTCATGCCCTATGACCGAGGCTTAC
ACGTATACAATGGTCGGTACAGAGGGTAGCCAAGCCCGAGGTGGAGGCAATCTCACAAAACGATGTAACGTTCCGGATT
GCACTGCGCAACTCGAGTGCATGAAGTGCAGTGAATCGTAGTAATCGCAGGTAGCAGTACGCGGTGAAACCGCAAGGAGCCGCTACCA
CGGTATGCTCATGACTGGGT
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Supplementary Table 49. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2627

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTGTTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACACTGGGACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCATT
AGCTGTTGGGCAACTGATTGCTAGTACCGTGAACCGCCTGGGACTGGGAGTACCGATGGCTGCAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGTACCGAATCCCCAGAGACAGGGAGGTGCCTCGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTTAGTGGCACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 50. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2628

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGGACCTTGGCCTTGCCTGTTGAGGGCCGATATCTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCATGCCGCTGTCTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGCGGGTTAACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGGGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTCAACCTGGGACTCGCTCTGAACACTGGGACTAGAGTGTGTCAGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCGATT
AGCTGTTGGGAGCTGACTGCTTAGTACCGAAGCTAACCGTGAACATGCCGCTGGGAGTACGGTGCAGGATTA
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGTACCGAACCCCTCCAGAGACAGGGAGGGTGCCTCGGGAGCGTAACACAGGTGTCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAAGTGGCACT
CTAATGAGACTGCCGGTGACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC
ACGTATACAATGGTCGGTACAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACGATGTCAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACACCGCCCGTCAACCATGGGAGTGGGGATACCAAGAAGTAGGTAGGTACCGCAAGGAGCCCCTACCA
CGGTATGCTTATGACTGGGTG

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Supplementary Table 51. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2572

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTTGGTTGGGTGGCGGACGGTGAGCAACCGCTA AAGAACTTGCCTCACAGATAGGACAACATTGGAAACGAATGCTAACCTGTGATATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCACTGTGAGAGAGCTTGGTCCATTAGCTAGTTGGAGAGGTACCGCTACCAAGGGCATGA TGGGTAGCCGGCTGAGAGGGTATCGGCCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCAGTGGG AATATTGGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACGATGAAGTTCGGGAATGTAAGTGCTTCA GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGACGGCTAAACATGTGCCAGCAGCCGGTAATACGTATGTC ACAAGCCTTACCGGATTTGGCGTAAGCGCTAGGTGGTTATGTAAGTCTGTGAAATGCAAGGGCTCAAC TCTGTATTGCGTTGGAAACTGTGTAAGTAGAGTACTGGAGAGGTACCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAAGCGCGAAGCGTGGTAGCAAACA GGATTAGATAACCTGGTAGCCACGCCGTAACAGATGATTACTAGGTGTTGGGGTCAACCTCAGCGCCAAGCAAACG CGATAAGTAATCCGCTGGGGAGTACGTACGCAAGTATGAAACTCAAAGGAATTGACGGGACCCGACAAGCGTGGAG CATGTGGTTAATCGACGCAACCGGAGCTTACCGCGTTGACATCTTAGGAATGAGACAGAGATGTTCACTGT CCCTCGGGGAAACCTAAAGACAGGTGGTAGCCACACGGCTACAGCTGTCGTCGAGATGTTGGGTAAGTCCCAC GAGCGCAACCCCTTCGTATGTTACCATCATTAGTTGGGACTCATGCGATACTGCCGCGTGCAGCAGGAGGAAGGTG GGGATGACGTCAGTCACTGATCCACACGGTGGTAGCCACACGGCTACAGCTGTCGAGATGTTGGGTAAGTCCCAC CGTGAGGTAGAGCTAATCTAGAAAATATTCTAGTTGGGACTCTGCAACTCGAGTACATGAAGTTGGATCG TAGTAATCGCGAATCAGCAATGTCGCGGTAAACGTTCTGGGTTGTACACACCGCCGTCACACCACGAGAGTTGG TTGCACCTGAAGTAGCAGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTG

Supplementary Table 52. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2573

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTTGGTTGGGTGGCGGACGGTGAGTAACCGCTA AAGAACTTGCCTCACAGATAGGACAACATTGGAAACGAATGCTAACCTGTGATATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCGCTGTGAGAGAGCTTGGTCCATTAGCTAGTTGGAGAGGTACCGCTACCAAGGGCATGA TGGGTAGCCGGCTGAGAGGGTATCGGCCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCAGTGGG AATATTGGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACGATGAAGTTCGGGAATGTAAGTGCTTCA GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGACGGCTAAACATGTGCCAGCAGCCGGTAATACGTATGTC ACAAGCCTTACCGGATTTGGCGTAAGCGCTAGGTGGTTATGTAAGTCTGTGAAATGCAAGGGCTCAAC TCTGTATTGCGTTGGAAACTGTGTAAGTAGAGTACTGGAGAGGTACCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAAGCGCGAAGCGTGGTAGCAAACA GGATTAGATAACCTGGTAGCCACGCCGTAACAGATGATTACTAGGTGTTGGGGTCAACCTCAGCGCCAAGCAAACG CGATAAGTAATCCGCTGGGGAGTACGTACGCAAGTATGAAACTCAAAGGAATTGACGGGACCCGACAAGCGTGGAG CATGTGGTTAATCGACGCAACCGGAGCTTACCGCGTTGACATCTTARGAATGAGACAGAGATGTTCACTGT CCCTCGGGGAAACCTAAAGACAGGTGGTAGCCACACGGCTACAGCTGTCGTCGAGATGTTGGGTAAGTCCCAC GAGCGCAACCCCTTCGTATGTTACCATCATTAGTTGGGACTCATGCGATACTGCCGCGTGCAGCAGGAGGAAGGTG GGGATGACGTCAGTCACTGATCCACACGGTGGTAGCCACACGGCTACAGCTGTCGAGATGTTGGGTAAGTCCCAC CGTGAGGTGGAGCTAATCTAGAAAATATTCTAGTTGGGACTCTGCAACTCGAGTACATGAAGTTGGATCG TAGTAATCGCGAATCAGCAATGTCGCGGTAAACGTTCTGGGTTGTACACACCGCCGTCACACCACGAGAGTTGG TTGCACCTGAAGTAGCAGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTG

Supplementary Table 53. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2574

Sequences (5' > 3')
ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTGCTCTGGGTGGCAGTGGCG AACGGGTGAGTAACATATCGAACGTACCGAGCAGTGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTTCT GAGGAAGAAAAGCAGGGGACATTGGCTTGCCTGAGAGGATCTGAGGGCCACACTGGACTGAGACACGCCAGACTCTACGG CTACCAAGGCAGCATCAGTAGCAGGGCTGAGAGGATCTGAGGGCCACACTGGACTGAGACACGCCAGACTCTACGG GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCTGATCCAGGCCACACTGGACTGAGACACGCCAGACTCTACGG GTAAAGGACTTTGTCAAGGAAGAAAAGGGCGGGTTAATACCCCTGTCTGATGACGGTACCTGAAGAATAAGCACCAGC TAACATCGTCCAGCAGCCCGTAATCGTAGGGTGCAGCGTTAACCGAATTACTGGCGTAAGCAGGGCAGACG GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGAACTCGCTCTGAACGGTACTGGGTACTAGAGTGTGTCAGAGG GAGGTAGAATTCCACGTGAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTCTGGATAA CACTGACGTTATGCCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGCCACGCCCTAACGATGTCGATT AGCTGTTGGCAGCTGACTGCTTAGTACGCAAGCTAACCGTGAATCGACCGCCTGGGAGTACGGTCGCAAGGATTAA AACTCAAAGGAATTGACGGGACCCGACAAGCGTGGATGATGTGATTAAATCGATGCAACGCGAAGAACCTTACCTG GTCTTGACATGTACGGAACCTCCAGAGACGGAGGGTGCCTCGGAGCGTAACACGGTGTGATGGCTGTC GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCTAGTTGCCATCATTAAGTGGCACT CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGATGACGTCAAGTCCTCATGCCCTATGACCAGGGCTTCAC ACGTATACAATGGTGGTACAGAGGTAGCCAACGCCGAGGTGGAGCCAATCTCACAAAACGATGTAATCCGGATT GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGTTCCGGGT CTTGTACACACGCCCGTACACCATGGAGTGGGATACCAAGAAGTAGGTAGGTACCGCAAGGAGCCCCTACCA CGGTATGCTTCACTGACTGGGTG

Supplementary Table 54. 16S rDNA sequences (1,443 bp) of Capnocytopha sp. KCOM 2575

Sequences (5' > 3')
GATGAACGCTAGCGCAGGCTAACACATGCAAGTCGAGGGGAGGTTACTTCGGTAACTGAGACCGCGTACGGTG CGTAAACGCGTATAACATCTCCTTCACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGGAGCAGC GCATCGTGTACTATTAAAGCTAGGTGGAAAGATGAGTATCGTTCTATTAGCTAGTTGGAGAGGTAAAGCCTCCCC AAGCGATGATAGATAGGGGCTGAGAGGGATGCCCCACACTGGTACTGAGATAACGGACCGGACTCCACGGGAGGC AGCAGTGGAAATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCGCGTGCAGGATGAAGGTTATGGATTGAA ACTGCTTTGTAAGGGAAAGATAAGGGCTACCGTAGTTGATGACGGTACCTTACGAAATAAGCATGGCTAACTCCGT CCAGCAGCCCGGTAATACGGGATGCGAGCGTATCCGAATCATTGGTTAAAGGTCTGAGGCGGCTGGTAAG TCAGAGGTGAAGGGCTCAGCTCAACTGAGCAACTGCCATTGAAACTGTTGCTTGAATGGTTGAGTGTGAAAGTAGTTGAAT GTGTAGTGTAGCGGTAAATGCTTAGATATTACACAGAACCCGATAGCGAAGGCATTACTAACAAATTGACGCT GATGGACGAAAGCGTGGGAGCGAACAGGATTAGATAACCTGGTAGTCCACGCTGAAACGATGGACTAGCTGTTGG TTAAGGATTGAGTGGCTAACGAAAGTATAAGTATCCCACCTGGGAGTACGTTGCCAAGAATGAAACTCAAAGGAAT TGACGGGGCCCGACAAGGGTGGAGCATGTTAATTGATGACCGAGGAACCTTACCAAGGTTAAATGGGG ACTGACAGGGTAGAGATACTTTCTCGGACAGTTCAAGGTGCTGATGGTTGCGTCAGCTCGTGCCTGAGGT GTCAGGTTAAAGCTTACGAGCGCAACCCCTGCCATTAGTTGCTAACGAGTCGAGTCGAGGCCCTAAATGGGACTGCC GGTCAAACCGAGAGGAAGGTGGGATGACGTCAAATCATCAGGCCCTACATCTGGCTACACACGTCTAACATGG CCGTACAGAGAGCAGCCACTGCGTGAGCAGGCCGAATCTATAAGCGGTACAGTTGGATCGAGTCGCAACTCG ACTCCGTGAAGCTGAAATCGTAGTAATCGGATATGCCATGATCCGGTAATACGTTCCGGCTTGACACACCGC CCGTCAAGCCATGGAAGCTGGAGTACCTGAAGACGGTTACCGCAAGGAGCTGTTAGGTAAAATAGTGA AAG

Supplementary Table 55. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2576

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTGAACTTCGGTTGGGTGGCGGACGGGTGAGTAACCGCTAACAGCTTGCTCAGGGACAACTTGAAACAGTCAATACCTGATATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCACTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGGATGA TGGGTAGCCGCCCTGAGAGGGTGTAGCCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCTGGGG AATATTGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACAGTGAAGTTTCGGAATGTAAGTGCTTCA GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGACGGCTAAATACGTGCCAGCAGCCGCGTAATACGTATGTC ACAAGCCTTATCCGGATTATTGGCGTAAAGCGCTAGGTGGTTATGTAAGTCTGATGTGAAAATGCAGGGCTCGAC TCTGTATTGCGTTGGAAACTGTGTAACTAGAGTACTGGAGAGGTAAGCGGAACTACAAGTGTAGAGGTGAAATCGTAGA TATTGTTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAACGCGAAAGCGTGGTAGCAAACA GGATTAGATAACCTGGTAGTCCACGCCGTAACGATGATTACTAGGTGTTGGGGTGAACCTCAGGCCAACGAAAC CGATAAGTAATCCGCTGGGAGTACGTACGCAAGTATGAAACTCAAAGGAGTTGACGGGACCCGACAAGCGTGGAG CATGTTGGTTAATTCGACGCAACCGGAGAACCTTACCGCTTGCATCTAGGAATGAGACAGAGATGTTCACTGT CCCTCGGGGAAACCTAAAGACAGGTGGCATGGCTGCCGTCAGCTCGTGTGAGATGTTGGGTAAGTCCCACAC GAGCGCAACCCCTTCGTATTTGACCATTAAGTGGGACTCATGGCTGCGATGAGCAGGAGGAGGTG GGGATGACGTCAGTCATCATGCCCTTACGCTGGGCTACACACGTGTACAATGGGTAGTACAGAGAGTCGCAAACG CGTGGAGTGGAGCTAATCTAGAAAATCTTCTAGTCCGGATTGTACTCTGCAACTCGAGTACATGAAGTGGATCG TAGTAATCGCAATCAGCAATGTTGCCGTAAGGAGGGATGCTCCGGGTCTGTACACACCAGCGTACACACAGAGAGTGG TTGACCTGAAGTAGCAGGCCAACCGTAAGGAGGGATGCTCCGGGTGATTAGCGATTGGGTG

Supplementary Table 56. 16S rDNA sequences (1,439 bp) of Capnocytopha sp. KCOM 2577

Sequences (5' > 3')
GATGAACGCTAGCGCAGGCCAACACATGCAAGTCAGGGGGAGGTTACTTCGGTAACTGAGACCGCGTACGGGTG CGTAAACGCGTATAACATCTGCCCTCACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGTAGTGTG GCATCACACAACATTAAAGCTTAGGTGGTAAAGATGAGTATGCGTTCTATTAGCTAGTGGAGAGGTAACGGCTCCCA AGGCATGATAGATAGGGGTTCTGAGAGGGATGTCCCCACACTGGTACTGAGATAACGGACAGACTCCTACGGGAGGA GCAGTGGAGAATATTGACAATGGCGGAAGACTGATCCAGCCATGCCGTGCAGGATGACGGCCTATGGGTTGAAA CTGCTTTGTAAGGGAAAGATAAGGACTACGTGAGTTGATGACGGTACCTTATGAATAAGCATGGCTAACTCCGTGC CAGCAGCCGCCGTAATACGGAGGATGCGAGCGTTATCCGAATCATTGGTTAAAGGGTCTGTAGGCGGGCTGGTAAGT CAGAGGTGAAAGCGCTCAGCTAACGCAACTGCCTTGAAGTGGTCTTGAATGGTTGAAAGTAGTTGGAATG TGAGTGTAGCGGTGAAATGCTTAGATATTACACAGAACCCGATAGCGAAGGCATATTACTAACAAATTAGCGCTG ATGGACGAAAGCGTGGGAGCGAACAGGATTAGATACCTGGTAGTCCACGCTGTAAACGATGGATACTAGCTGTTGGT TTAAGGATTGAGTGGCTAACGCAAAGTGTAGTATCCACCTGGGAGTACGTTGCAAGAATGAAACTCAAAGGAATT GACGGGGGCCGACAAGCGTGGAGCATGGTTAATTGATGACCGAGGAACCTTACCAAGGTTAAATGGGA CTGACAGGGGTAGAGATAACCTTTCTCGGACAGTTCAAGGTGCTGCATGGTTGCGTCAGCTCGTCCGTGAGGTG TCAGGTTAAGCTATAACGAGCGAACCCCTGCCATTAGTGCTAACGAGTCGAGTCGAGCCCTCAATGGACTGCC GTGCAAACCGAGGAAGGTGGGATGACGTCAAATCATCACGCCCTACATCTGGGCTACACACGTGTACAATGG CGTTACAGAGAGCAGCCACTGCGTAGCAGGCGGAATCTAAAGACGGTCACAGTCCGGATGGAGTCTGCAACTCGA CTCCGTGAAGCTGGATCGCTAGTAATCGGATATCAGCCATGATCCGGTAAGTACGTTCCGGCTTGTACACACCGCC CGTCAAGCCATGGAAGCTGGGGTACCTGAAGACGGTTACCGCAAGGAGGTGTTAGGGTAAACTAGTGACTGGGCT

Supplementary Table 57. 16S rDNA sequences (1,447 bp) of Capnocytopha sp. KCOM 2578

Sequences (5' > 3')
AGTCCTAATCACCACTCCACCTTCGACGGCTCCCCACAACGGTTAGGCCACGGCTGGGTGTTACCAACTTCATG ACTTGACGGCGGTGTGATACAAGCCCCGGAACGTATTACCGCAGCGTGTGATCTGCAGATTACTAGCAGCTCGACT TCATGAGGTGAGTTGAGCCCCAACTCGAACCTGAGACGGCTTCCGAGATTGCGTACCCCTCACAGGCTCGCACTC TCTGTACCAGCCATTGAGCATGCGTAAGCCCTGGACATAAGGGCATGATGACTTGACGTATCCCACCTTCTCCG AGTTGACCCGGCGGTCTCCACTGAGTCCCCACCATAACGTGCTGGAACAGTGAACAAGGGTTGCGCTCGTGGGAC TTAACCCAACATCTCACGACACGAGCTGACGACGCCATGACCCACCTGTGAACCGACCCAAAAGAGGCACACCCATCT CTGAGCACTCCGATCCATGCAAACCCAGGTAGGTTACCGCGTGCATCGAATTATCCGATGCTCCGCCGTTGT GCGGGGCCCCGTCATTCTTGAGGTTAGCCTGCGCCGTACTCCCAGGGCTACTAAAGCGTTAGCTACGGC GCGGAACCGTGGATGGACCCACACCTAGTACCCACCGTTACAGCGTGGACTACCAGGGTATCTAAGCGTTAGCTACGGC CCCCACGCTTCGCTCCTCAGCGTCAAGGAAAGGCCAGAGAACGCCCTCGCCACTGGTCTCTGATATCTGCGCA TTCCACCGCTCCACCAGGAATTCCATTCTCCCTACCTCCCTACGTAAGTCACCGTATCGAAAGCACGCTCAGGGTAAGC CCCAAGATTACACTTCCGACGCGATCAACCACCTACGAGCCCTTACGCCAATAATCCGACAACGCTCGCACCCCTAC GTATCACCGCCGTGCTGGCACGTAGTTAGCCGGTGCTCTTACCCATTACCGTCACTACGCTTCGTCACAGGGAAA GCGGTTTACAACCGAAGGGCGTACCCGACCGGGTGTGCGTACAGGCTCCGCCATTGTGCAATTATCCCCAC TGCTGCCTCCCGTAGGAGTCTGGCGGTATCTCAGTCCAAATGTGGCGGTACCCCTCTAGGCCGGTACCCGTC CCTTGGTAAGCCACTACCCACCAACAAGCTGATAAGCCGAGTCCATCCCAACGCCGAAACTTCAACCCCCACC ATGCAGCAGGAGCTCTATCGGTATTAGCCCAGTTCTGAAGTTATCCAAAGCTAAGGGCAGGTTACTCAGTGT ACTCACCGTTCGCACTCGAGCACCCACAAAGCAGGGCTTCCGACTTGATGTGTTAAGCACGCCAGC GTTCGTC

Supplementary Table 58. 16S rDNA sequences (1,438 bp) of Capnocytopha sp. KCOM 2579

Sequences (5' > 3')
CTTCACCCAGTCGTGATTCACGTGGAGGGTAGCGAATTCGATCCCGCTTCGAGTGAATCAACTCCATGGTG TGACGGGGCGGTGAGTACAAGACCCGGAACGTATTACCGTAGCATGGCTGATCTACGATTACTAGCGATTCCGGCTTC TGGAGTCGAGTTGAGACTCCAATCGAACACTGGACATATTTTAGATTGCTCCATCTCGCGATATTGCGTCTATTG TATATGCCATTGAGCACGTGTGCCCCGGACATAAGGGCATGATGACTGACGTGCTCCACACCTTCTCCCT ACGAAGGCAGTCTATTAGTGCTGGCGAACCGTAGCAACTAATGACGTGGGTGCGCTGTTGGACTTAACC CAACATCTCACGACACGAGCTGACGACAGCGTAGCAGCACCTGTCTAACATTCTGCAAGCACACTCTCCATCT GGATGATTGTTAGGTATCAAGTCCGGTAAGGTTCTCGCGTATCTCGAATTAAACCACATGCTCCACCGCTTGCG GGTCCCCGTCATTCTTTAGTTAATCTGCGACCGTACTCCCAAGGGGTATACTTAATCGTTAGGTGGATTACT GCCGTGACTAGCACAGCAACAACCGGTATACATCGTTAGGGCGTGGACTACCAGGGTATCTAATCTGTTGCTCCCA CGCTTACCGATTAGCGTCAGTTAGTCCAGCAGATCGCCTCGCAATAGGTATTCTGATATCTAGGATT CCCCTACACCAAGAATTCCATCTGCCCTCCCTACTCTAGATTACAGTTCCAAAGCAGTTAACGGTTGAGCGTTA GATTTCACAAGAGACTTGATAATCCGCTACCGTCCTTACGCCAGTGAACGCTTGACCCCTCGTATT ACCGCGGCTGCTGGCACGGAGTTAGCCGGTGTATTGTTAGGTACCGTCATTATTCTCCATAACAAAGGAGTTAC GCTCGAAAAGTGTCACTCTCCACGCCGCGTGTGCGTCAGGGTTCCCGATTGCCAATATTCCCTACTGCTGCCTC CCGTAGGAGTTGGACCGTGTCAAGTCAATGTGACTGATCATCCTCAGACCGATTACGCGTCAAGCCTCGGTAG GCCGTTACCCACCGACTAGCTGATAAGTCCCATCCCTGCCAATTCTCCGATTATCTTATGGAAAA AGGAGTATGGAGTATTAGCGTCATTCTAACTGTTGCTCCAGCAAGGGCAGATTAGCTATATTAACCGCTG GCCACTAAATTAAAGAGCAAGCTTTAAATTCCGTTGACTTGATGTATTAGGCACGCCAGCGTCACT

Supplementary Table 59. 16S rDNA sequences (1,447 bp) of Capnocytopha sp. KCOM 2580

Sequences (5' > 3')
AGTCCTAATCACCACTCCACCTTCGACGGCTCCCCACAACGGTTAGGCCACGGCTGGGTGTTACCAACTTCATG ACTTGACGGCGGTGTGATCACAGCCCCGAACGTATTCAACCGCAGCGTGTGATCGGATTACTAGCAGCTCGACT TCATGAGGTGAGTTGAGCCCCAACTCGAACCTGAGGACGGCTTCGAGATTCGTCACCCCATCAGGCTCGCACTC TCTGTACCAGCCATTGAGCATGCGTAAGCCCTGGACATAAGGGCATGATGACTTGACGTATCCCACCTCTCCG AGTTGACCCGGCGGTCTCACTGAGTCCCACCATACGTTGCTGGAACAGTGAACAAGGGTTGCCTCGTGCAGGAC TTAACCCAACATCTCACGACACGAGCTGACGACGCCATGCACCCACCTGTGAACCGACCCAAAAGAGGACACCCATCT CTGAGCACTCCGATCCATGCAAACCCAGGTAAAGGTTACCGCTTGATCGAATTATCCGATGCTCCGCCGTTGT GCGGGGCCCCGTCATTCTTGAGTTAGCCTTGCGGCCGTACTCCCCAGGGCTACTAAAGCGTTAGCTACGGC GCGGAACCCGTTGAAATGGACCCACACCTAGTACCCACCGTTACAGCGTGGACTACCAGGGTATCTAAGCGTTGCTACGGC CCCCACGCTTCGCTCCTCAGCGTCAAGGAAAGGCCAGAGAACGCCCTCGCCACTGGTCTCTGATATCTGCGCA TTCCACCGCTCCACCAGGAATTCCATTCTCCCTACCTCCCAAGTCACCGTATCGAAAGCACGCTCAGGGTAAGC CCCAAGATTACACTTCCGACGCGATCAACCACCTACGAGCCCTTACGCCAATAATCCGACAACGCTCGCACCC GTATCACCGCCGTGCTGGCACGTAGTTAGCCTGCTCTTACCCATTACCGACACTCACGCTCGTCAAGGGCAA GCGGTTTACAACCGAAGGGCGTACCCGACCGCGTTGCTGATCAGGCTCCGCCATTGTGCAATTATCCCCAC TGCTGCCTCCCGTAGGAGTCTGGCGTATCTCAGTCCAAATGTGGCGGTACCCCTCTAGGCCGCTACCGCTAAAG CCTTGGTAAGCCACTACCCACCAACAAGCTGATAAGCCGAGTCCATCCAAACGCCGAAACTTCAACCCCC ATGCAGCAGGAGCTCTATCGGTATTAGCCCAGTTCTGAAGTTATCCAAAGCTAAGGGCAGGTTACTCAGTGT ACTACCCGTTGCCACTCGAGCACCCACAAAGCAGGGCTTCCGACTTGATGTGTTAAGCACGCCAGC GTTCGTC

Supplementary Table 60. 16S rDNA sequences (1,433 bp) of Capnocytopha sp. KCOM 2581

Sequences (5' > 3')
CACCCAGTCGCTATTCACTGTGGACATAACGATTGGTATTGGCTCGAGTGAAATCAACTCCATGGTGTGA CGGGCGGTGAGTACAAGACCGGAAACGTATTCAACCGTAGCATGGCTATCGATTACTAGCAGTTCCGCTTCATGG AGTCAGAGTGCAGACTCCAATCCGAACCTGGGACGTATTATAGATTTCGTCATCTCGGATATTGCGTCTATTGAT ACGCCATTGAGCACGTGTGCGCCCGACATAAGGGCATGATGACTTGACGTGTCACACCTCTCTCTTACG AAGGCAGTCTATTAGAGTCTGGCTAACCGTTAGCAACTAAATACGTTGGTGGCTCGTTGGGACTTAACCCAA CATCTCACGACACGAGCTGACGACAGCCGTGAGCACCTGTCTAACATTCCGCAAGCAGACACTTCCATCTGGA TGATTGTTAGATATCAAGTCCGGTAAGGTTCTCGGTATCTCGAATTAAACCATGCTCCACCGCTGTGCGGGT CCCCGTCTATTCTTGAGTTAACTTGCACCGTACTCCCAGGGTATACTTAATCCGTTAGGTGCACTACTGCC TCGACTAGCGAAGCAACAACAGTATACATCGTTAGGGCGTGGACTACCAGGGTATCTAATCTGTTGCTCCACCG TTTCACGCATTAGCGTCAGTTAACGTTAGCAGATCGCTTCTGCAATGGGATTCTCTGATCTACGGATTACCC CTACACCAAGAATTCCATCTGCCCTCCCTACTCTAGATTATCAGTTCCAAGCAGTTAACGGTTAACCGTAGAT TTCACAAGAGACTTGATAATCCGCTACCGCTCTACGCCAGTGATTCCGAGTAACGCTTGCACCCCTCGTATTAC GCGGCTGCTGGCACGGAGTTAGCCGGTGCTTATTCTGGTACCGTCTAACATTCTTCCAAGAAAAGGAGTTACGCT CCGAAAGTGTGATCCTCCACGCCGGCTTGTCTCAGGGTTCCCCATTGAGCAATATTCCCTACTGCTGCCCTCCG TAGGAGTCTGGACCGTGTCTCAGTTCCAGTGTGACTGATCATCTCTCAGACCGAGTACCGCTCATAGCCTGGTAGGCC GTTACCTTACCAACTAGCTGATACGATATAGCCTCATCTACACCGAAAAACTTCCGACTAAGCTTATGCTTAGAAGG AGTATAGAGTATTAGCAGTCGTTCAACTGTTGCTCTAGTGTAGGGCAGATTAGCTATATTAACCCCCGTGCGC CACTAAGATTAAAGCAAGCTACTTAATCTCGTTGACTTGATGTATTAGGCACGCCAGCGTTACT

Supplementary Table 61. 16S rDNA sequences (1,429 bp) of Capnocytopha sp. KCOM 2582

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTGAACTTCGGTTGGGTGGCGGACGGGTGCGTAACCGCGTA AAGAACCTGCCTCACAGATAGGGACAACATTGAAACAGAATGCTAATACCTGATATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCACTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGGATGA TGGGTAGCCGCCCTGAGAGGGTGTAGCGGCCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCTGGGG AATATTGGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACAGTGAAGTTTCGGAATGTAAGTGCTTCA GTTGGGAAAGAAAAAAATGACGGTACCAACAGAAGTGAACGGCTAAATACGTGCCAGCAGCCGCGTAATACGTATGTC ACAAGCGTTATCCGGATTATTGGGCTAAAGCGCGTAGGTGGTTATGTAAGTCTGATGTGAAAATGCAAGGCTCAAC TCTGTATTGCGTTGAAACTGTGTAACTAGAGTACTGGAGAGGTAAGCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAACGCGAAAGCGTGGGTAGCAAACA GGATTAGATAACCTGGTAGTCCACGCCGAAACGATGATTACTAGGTGTTGGGGTCAACCTCAGGCCAACGAAACG CGATAAGTAATCCGCTGGGgAGTACGTACGCAAGTATGAAACTCAAGGAATTGACGGGGACCCGACAAGCGTGG GCATGTGGTTAATTGACGCCAACGCGAGGAACCTTACCGCTGGTGTcGTCAGCTCGTGTGAGATGTTGGGTTAGTCCC TCCCTCGGGAAACCTAAAGACAGGTGGTGCATGGCTGAGATGTTGGGTTAGTCCC CGAGCGCAACCCCTTCGTATGTTACCATCATTAAGTGGGACTCATGCCGACTCGCTGCGATGAGCAGGAGGAAAGG GGGGATGACGTCAAGTCATCATGCCCTTACGCTGGCTACACCGTGCTACAATGGTAGTACAGAGAGTGC CCGTGAGGTGGAGCTATCTAGAAACTATTCTTAGTTGACTCTGCAACTCGAGTACATGAAGTTGGAAATCG CTAGTAATCGCAATCAGCAATGTCGCGGTGAATACGTTCTCGGTCTGTACACACC GAGAGTGTGATTAGCAGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCATTGGGTG GTTGACACTGAAGTAGCAGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCATTGGGTG

Supplementary Table 62. 16S rDNA sequences (1,473 bp) of Capnocytopha sp. KCOM 2583

Sequences (5' > 3')
GATGAACGCTAGCGCAGGCCAACACATGCAAGTCAGGGGGAGGTTACTTCGGGTAACTGAGACCGCGTACGGGTG CGTAACCGCTATAACATCTGCCCTCACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGGAGCAG GCATCGTGTACTATTAAAGCTTAGGTGGTAAAGATGAGTATGCGTTCTATTAGCTAGTGGAGAGGTAACGGCTCCCC AAGGGCATGATAGATAAGGGTCTGAGAGGGATGCCCCAACACTGGTACTGAGATAACGGGACAGCTCCTACGGGAGGC AGCAGTGAGGAATATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCGCGTGCAGGATGAAGGCTTATGGATTGAA ACTGCTTTGTAAGGGAAAGATAAGGGCTACGCGTAGTTGATGACGGTACCTTACGAATAAGCATGGCTAACTCCGT CCAGCAGCCGCGTAATACGGAGGATGCGAGCGTATCCGAATCATTGGTTAAAGGGTCTGTAGGGGGCTTGTAG TCAGAGGTGAAAGCGCTCAGCTCAACTGAGCAACTGCCATTGAAACTGTTGGTCTTGAATGGTTGTAAGTAGTTGAA GTGTAGTGTAGCGGTAAATGCTTAGTATTACACAGAACCCGATAGCGAAGGCATATTACTAACAAATTGACGCT GATGGACGAAAGCGTGGGGAGCGAACAGGATTAGATACCCCTGGTAGTCCACGCTATAACGATGGATACTGCTGTTGG TTAAGGATTGAGTGGCTAACGCAAAGTGATAAGTATCCCACCTGGGAGTACGTTGCCAGAATGAAACTCAAAGGAAT TGACGGGGGCCGACAAGGGTGGAGCATGTTGTTAATTGATGACCGGAGAACCTTACCAAGGTTAAATGGGG ACTGACAGGGTAGAGATACTTTCTCGGACAGTTCAAGGTGCTGCATGGTTGCTCAGCTCGTGCCTGAGGT GTCAGGTTAAGTCTATAACGAGCGAACCCCTGCCATTAGTGTCAAGGTGCTGAGTCGAGTGCAGCCCTTAATGGGACTGCC GGTGCAGGAAACCGAGAGGAAGGTGGGGATGACGTCAAATCATACGGCCCTACATCTGGGCTACACACGTGCTACAATGG CCGTTACAGAGAGCAGCCACTGCGTAGCAGGCGCGAATCTATAAGACGGTACAGTCCGGATCGGAGTGTGCAACTCG ACTCCGTGAAGCTGGAATCCCTAGTAACTGGATACGCCATGATCCGGTGAATACGTTCCGGCCTTGTACACACC CCGTCAAGCCATGGAAGCTGGAGTACCTGAAGACGGTACCGCAAGGAGCTGTTAGGGTAAACTAGTGA CTGGGCT

Supplementary Table 63. 16S rDNA sequences (1,447 bp) of Capnocytopha sp. KCOM 2584

Sequences (5' > 3')

```

AGTCCTAATCACCACTCCACCTTCGACGGCTCCCCACAACGGTTAGGCCACCGGCTGGGTGTTACCAACTTCATG
ACTTGACGGCGGTGTGATCACAGCCCCGGAACGTATTACCGCAGCGTGTGATCGGATTACTAGCGACTCCGACT
TCATGAGGTGAGTTGAGACCCCCAATCGAACTGAGACCGGTTCCGAGATTGCGTACCCCTCACAGGCTCGCACTC
TCTGTACCAGCCATTGAGCATGCGTAAGCCCTGGACATAAGGGCATGATGACTTGACGTACCCACCTTCG
AGTTGACCCGGCGGTCTCCACTGAGTCCCACCATAACGTGCTGGAACAGTGAACAAGGGTTGCCTCGTGGGAC
TTAACCCAACATCTCACGACACGAGCTGACGACGCCATGCACCCACCTGTGAACCGACCCAAAAGAGGCACACCCATCT
CTGAGCACCCCCGATCCATGCAAACCCAGGTAAAGGTTACCGCGTGCATCGAATTATCCGATGCTCCGCCGTTGT
GCGGGGCCCCGTCATTCTTGAGTTAGCCTTGCGGCCGTACTCCCAGGCGGGTACTAAAGCGTTAGCTACGGC
GCGGAACCCGTTGAAATGGACCCACACCTAGTACCCACCGTTACAGCGTGGACTACCAGGGTATCTAAGCCTGTCGCT
CCCCACGCTTCGCTCCTCAGCGTCAAGGAAAGGCCAGAGAACGCCCTCGCCACTGGTCTCTGATATCTGCGCA
TTCCACCGCTCCACCAGGAATTCCATTCTCCCTACCTCCCTACGTAAGTCACCGTATCGAAAGCACGCTCAGGGTAAGC
CCCAAGATTACACTTCCGACGCGATCAACACCTACGAGCCCTTACGCCAATAATCCGACAACGCTCGCACCCCTAC
GTATCACCGCCGTGCTGGCACGTAGTTAGCCGGTGCTCTTACCCATTACCGTCACTACGCTTGTGCAAGGGCAA
GCGGTTTACAACCGAAGGGCGTACCCGACGGCGTTGCTGATCAGGCTCCGCCATTGTGCAATATTCCCCAC
TGCTGCCTCCCGTAGGAGTCTGGCGGTATCTCAGTCCAAATGTGGCGGTACCCCTCTAGGCGGCTACCGTCAAAG
CCTTGGTAAGCCACTACCCACCAACAAGCTGATAAGCCGAGTCCATCCAAACGCCGAAACTTCAACCCCCACC
ATGCAGCAGGAGCTCTATCGGTATTAGCCCAGTTCTGAAGTTATCCAAAGTCAGGCAAGGGCAGGTTACTCAGTGT
ACTACCCGTTGCCACTCGAGCACCCACAAAGCAGGGCTTCCGACTTGCATGTGTTAAGCACGCCAGC
GTTCGTC

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Supplementary Table 64. 16S rDNA sequences (1,434 bp) of Capnocytopha sp. KCOM 2585

Sequences (5' > 3')

```

GATGAACGCTGACAGAATGCTAACACATGCAAGTCTTGGCAAGGCTGTGCTTGACAGCCTAGCCAAGGGCGACGGGT
GAGTAACCGCTAAGGGACTTGGCCCTGCACTGAGGATAACAGACGGAAACGACTGATAAGACCTGGTAAAGTCAGGCCGA
CTCATGTCAGCCTGATGAAAAGGAATGCTGCAAGGAGAGCCTTGCCTATTAGCTTGTGTTGGTGGGTAACGGCCACC
AAGGCATGATAGGTAGCCGCTGAGAGGGTGGACGGCCAAGGGACTGAGATAACGCCCTACTCCTACGGGAGGC
AGCAGTGGGAATATTGGACAATGGGGCAACCCGATCCAGCAATTCTGTGCACTGAGATAACGCCCTACTCCTACGGGAGGC
GTGCTTCAGCAGGGAGAAAAAAATGACGGTACCTGCAAGAAGCGACGGCTAAATACGTGCCAGCAGCGCGTAAT
ACGTATGTCGCGAGCGTTATCGGAATTATTGGCATAAGGGCATCTAGGGCCCTGTAAGTCTAGGGTAAAACCTG
CGGCTAACCGCAGGCCCTGGCGAAACTACAGGGCTAGGTGCTGGAGAGGTGGACGGAACTGCACGAGTAGAGGTGA
AATTCTGAGATATGTCAGGAATGCCGATGATGAAGATAGTCAGTGGCAACTGACGCTGAAGTGCAGAAAGCTAGG
GGAGCAAACAGGATTAGATAACCTGGTAGCTGAAACGATGATTACTGGGTGTTGGCATGAAGAGTGTCCGTG
CGAAGCTAATGCGATAAGTAATCCGCTGGGAGTACGGCCGAAGGCTAAACTCAAGGAATTGACGGGGACCGC
AAGCGTGGAGCATGTTAATTGACGCAACGCGAGGAACCTTACCGATCTTGACATCCTGCAAGGCCCTGCGAGA
GCAGGCTGTGCCCTGGGAACGCGAGAGACAGGTGGCATGGCTGCAAGCTGCTGAGATGTTGGGTTAAGTC
CCGCAACGAGCGAACCCCTATTGCCAGTGCATCATTAGTTGGGACTCTGGCAGACTGCCCTGCAAGAGCAGGAG
GAAGGCGGGATGACGTCAAGTCATGCCCTATGATCTGGCTACACACGTGCTACAATGGCGGAACAGAGAGCT
GCAAGGCGGCAACGCCAAGCCAACCTTCAAGCCGGTCAAGTCCGGATTGAAGCCTGCAACTCGGCTCATGAAGCTGG
AATCGCTAGTAATCGCAGATCAGCAATGCTGCGGTGAATACGTTCTCGGGTCTTGTACACACCGCCGTCACACCACGAG
AGTTGTCTGACCTGAAGCTGCCGGTCAACCGCAAGGGGAAAGCATCTAAGGTGGATAGTGTGTTAAGG

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Supplementary Table 65. 16S rDNA sequences (1,447 bp) of Capnocytopha sp. KCOM 2586

Sequences (5' > 3')

```

AGTCCTAATCACCACTCCCACCTTCGACGGCTCCCCACAACGGTTAGGCACCGGCTGGGTGTTACCAACTTCATG
ACTTGACGGCGGTGTGATACAAGCCCCGGAACGTATTCACCGCAGCGTGTGATCTCGGATTACTAGCGACTCCGACT
TCATGAGGTGAGTTGAGCCCCAACTCGAACCTGAGGACCGGTTCCGAGATTGCGTACCCCTCACAGGCTCGCACTC
TCTGTACCAGGCCATTGAGCATGCGTAAGCCCTGGACATAAGGGCATGATGACTTGACGTACCCACCTTCCTCCG
AGTTGACCCCCGGCGGTCTCCACTGAGTCCCACCATAACGTGCTGGAACAGTGAACAAGGGTTGCGCTCGTGGGAC
TTAACCCAACATCTCACGACACGAGCTGACGACGCCATGCACCCACCTGTGAACCGaCCCCAAAAGAGGCACACCCATCT
YTGAGCACTCCGATCCATGCAAACCCAGGTAAAGGTTACCGCGTGCATCGAATTATCCGATGCTCCGCCGTTGT
GCGGGGCCCCGTCATTCTTGAGTTAGCCTGCGCCGTACTCCCAGGGCGGGTACTAAAGCGTTAGCTACGGC
GCGGAACCCGTTGAAATGGACCCCACACCTAGTACCCACCGTTACAGCGTGGACTACCAGGGTATCTAAGCCTGTCGCT
CCCCACGCTTCGCTCCTCACGCTCAGGAAAGGCCAGAGGACGCCACTGGTCTCTGATATCTGCGCA
TTCCACCGCTCCACCAGGAATTCCATTCTCCCTACCTCCCTCACGTCAGTCAACCCGTATCGAAAGCACGCTCAGGGTAAGC
CCCAAGATTACACTTCCGACGCGATCAACCACCTACGAGCCCTTACGCCAATAATCCGGAACACGCTCGCACCCCTAC
GTATCACCGCCGTGCTGGCACGTAGTTAGCCGGTGCTCTTACCCATTACCGTCACTCACGCTCGTCAAGGGCAA
GCGGTTTACAACCGAAGGGCGTACCCGACCGCCGTTGCTGCATCAGGCTCCGCCATTGTGCAATATTCCCCAC
TGCTGCCTCCCGTAGGAGTCTGGCGGTATCTCAGTCCAAATGTGGCGGTACCCCTCTAGGCGGCTACCGTCAAAG
CCTTGGTAAGCCACTACCCACCAACAAGCTGATAAGCCGAGTCCATCCCAACCGCGAAACTTCAACCCCCACC
ATGCAGCAGGAGCTCTATCGGTATTAGCCCAGTTCTGAAGTTATCCAAAGTCAGGGCAGGTTACTCAGTGT
ACTACCCGTTGCCACTCGAGCACCCACAAAGCAGGGCCTTCGACTTGATGTGTTAAGCACGCCAGC
GTTCGTC

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Supplementary Table 66. 16S rDNA sequences (1,433 bp) of Capnocytopha sp. KCOM 2587

Sequences (5' > 3')

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CACCCCAAGTCGCTGATTCCACTGTGGACCATAACAGTTGGTATTTGGCTTCGAGTGAAATCAACTCCATGGTGTGA
CGGGCGGTGAGTACAAGACCGGAAACGTATTCACCGTAGCATGGCTGATCTACAATTACTAGCGATTCCGCTTCATGG
AGTCGAGTTGAGACTCCAATCGAACCTGGACATATTATAGATTGCTCCATCTCGGATATTGCGTCTATGTAT
ACGCCATTGAGCACGTGTGCGCCCGGACATAAGGGCATGATGACTTGACGTGCGTCCACACCTCCCTCCCTGCG
AAGGCAGTCTATTAGAGTCTGGCGAACCGTTAGCAACTAATGACGTGGTTGCGCTCGTTGGGACTTAACCCAA
CATCTCACGACACGAGCTGACGACAGCGTGAGCACCTGTCTTAACATTCTGCAAGCAGACACTCTCCATCTGGA
TGATTGTTAGATATCAAGTCCGGTAAGGTTCTCGGTATCTCGAATTAAACCATGCTCCACCGCTGTGCGGGT
CCCCGTCTATTCTTGAGTTAACTTGCACCGTACTCCCAGGGGTACTAATCCGTTAGGTGCACTACTG
TCGACTAGCGAAGCAACAACAGTATACATCGTTAGGGCGTGGACTACCAGGGTATCTAATCTGTTGCTCCACCG
TTTACCGCATTAGCGTCAGTTAACAGTCCAGCAGATCGCTTCCGCAATGGGTATTCTCTGATCTACGGATTACCC
CTACACCAAGAATTCCATCTGCCCTCCCTACTCTAGATTATCAGTTCCAAAGCAGTTAACGGTTAGCGTAAAG
TTCACAAGAGACTTGATAATCCGCTACCGCCTTACGCCAGTGTGATTCCGAGTAACGCTTGACCCCTCGTATTAC
GCGGCTGCTGGCACGGAGTTAGCCGGTGTCTTATTCTGGGTACCGTCAATTCTTCCAAAGAAAAGGAGTTACGCT
CCGAAAGTGTCTCCACCGCGGTTGCTGCTCAGGGTTCCCCATTGAGCAATATTCCCTACTGCTGCCCTCCG
TAGGAGTCTGGACCGTGTCTCAGTTAACAGTGTGACTGATCATCCTCTCAGACCAAGTACGCGTCAAGCCTGGTAAAGCC
ATTACCTTACCAACTAGCTGATAAGCATATAGCCCTATCATTACCGAAAAACTTCCGTACCTACTTATATAGATACGG
AGTATAAGGTATTAGCAGTCGTTCAACTGTTGTCCTAGTAATGGCAAGTTAGCTATATATTACTCACCGTGC
CACTAAGATTAATAGCAAGCTACTTAATCTCCGTTGACTTGATGTATTAGGCACGCCAGCGTCACT

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Supplementary Table 67. 16S rDNA sequences (1,447 bp) of Capnocytopha sp. KCOM 2588

Sequences (5' > 3')
AGTCCTAATCACCACTCCACCTTCGACGGCTCCCCACAACGGTTAGGCCACGGCTGGGTGTTACCAACTTCATG ACTTGACGGCGGTGTGATCACAGCCCCGAACGTATTACCGCAGCGTGTGATCGGATTACTAGCAGCTCGACT TCATGAGGTGAGTTGAGACCCCCAATCGAACCTGAGTGGACATAAGGGCATGATGACTTGACGTACCCACCTTCG TCTGTACCAGCCATTGAGCATGCGTAAGCCCACATAACGTGCTGGAACAGTGAACAAGGGTTGCGCTCGTGGGAC AGTTGACCCGGCGGTCTCCACTGAGTCCCACATAACGTGCTGGAACAGTGAACAAGGGTTGCGCTCGTGGGAC TTAACCCAACATCTCACGACACGAGCTGACGACGCCATGCACCCACCTGTGAACCGACCCAAAAGAGGCACACCATCT CTGAGCACTCCGATCCATGCAAACCCAGGTAAAGGTTACCGCGTGCATCGAATTATCCGATGCTCCGCCGTTGT GCGGGGCCCCGTCATTCTTGAGTTAGCCTGCGCCGTACTCCCAGGCGGGTACTAAAGCGTTAGCTACGGC GCGGAACCGTGAATGGACCCACACCTAGTACCCACCGTTACAGCGTGGACTACCAGGGTATCTAAGCGTTGCTACGGC CCCCACGCTTCGCTCCTCAGCGTCAAGGAAAGGCCAGAGAACCGCCTCGCCACTGGTGTCTCTGATATCTGCGCA TTCCACCGCTCCACCAGGAATTCCATTCTCCCTACCTCCCTACGTAAGTCACCGTATCGAAAGCACGCTCAGGGTAAGC CCCAAGATCACACTCCGACGCGATCAACCACCTACGAGCCCTTACGCCAATAATCCGACAACGCTCGCACCCCTAC GTATCACCGCCGTGCTGGCACGTAGTTAGCCGGTGCTCTTACCCATTACCGTCACTACGCTTCGTCACAGGGAAA GCGGTTTACAACCGAAGGGCGTACCCGACCGCGTGTGCGTACAGGCTCCGCCATTGTGCAATTATCCCCAC TGCTGCCTCCCGTAGGAGTCTGGCGTATCTCAGTCCAAATGTGGCGGTACCCCTCTAGGCCGGTACCCGTC CCTTGGTAAGGCAACTACCCACCAACAAGCTGATAAGCCGAGTCCATCCCAACCGCGAAACTTCAACCCCA ATGCAGCAGGAGCTCTATCGGTATTAGCCCAGTTCTGAAGTTATCCAAAGCTAAGGGCAGGTTACTCAGTGT ACTACCCGTTGCCACTCGAGCACCCACAAAGCAGGGCTTCGACTTGATGTGTTAAGCACGCCAGC GTTCGTC

Supplementary Table 68. 16S rDNA sequences (1,440 bp) of Capnocytopha sp. KCOM 2589

Sequences (5' > 3')
GATGAACGCTAGCGCAGGCCAACACATGAACTGAGGGGGAGGTTACTTCGGTAACTGAGACCGCGTACGGGTG CGTAAACGCGTATAACATCTGCCCTACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGGAGCAGC GCATCGTGTAACTATTAAAGCTTAGGTGGTAAAGATGAGTATCGCTTCTATTAGCTAGTTGGAGAGGTAAACGGCTCCCC AAGGGCATGATAGATAGGGTCTGAGAGGGATGCCCCAACACTGGTACTGAGATAACGGGACACTCCTACGGGAGGC AGCAGTGGAAATATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCCGTGCAGGATGACGCCATTGGTTGTAA ACTGCTTTGTAAGGGAAAGATAAGGACTACGTGAGTTGATGACGGTACCTTATGAAATAAGCATGGCTAACTCCGT CCAGCAGCCGGTAATACGGGATGCGAGCGTATCCGAATCATTGGTTAAAGGGTGTAGGCGGGCTGGTAAG TCAGAGGTAAAGCGCTCAGCTCAACTGAGCAACTGCCATTGGTCTGAAACTGTTGGTCTGAAAGTAGTTGAAT GTGAGTGTAGCGGTAAAGCTTAGATATTACAGAACCCGATAGTGAAGGCaATTACTAACAAATTGACGCT GATGGACGAAAGCGTGGGGAGCGAACAGGATTAGATACCCGTAGTCCACGCTGAAACGATGGATACTAGCTGTTGG TTTAAGACTGAGTGGCTAACGAAAGTGATAAGTATCCCACCTGGGAGTACGTTCCGAAGAATGAAACTCAAAGGAAT TGACGGGGCCCGACAAGGGTGGAGCATGTTGTTATTGATGATACCGAGGAACCTTACCAAGGTTAAATGGAG ACTGACAGGGTAGAGATACTTTCTCGGACAGTTCAAGGTGCTGCATGGTTGCGTACGCTCGTGGACTGCC GTCAGGTTAAGCTCTATAACGAGCGAACCCCTGCCATTAGTGTGAACTGAGTTAAGTCGAGGCCCTAGTGGACTGCC GGTCAAGGCAACCGTGGAGAGTGGGGATGACGTAAACATCACGCCCTACATCTGGCTACACACGTGCTACATGG CCGTTACAGAGAGCAGCCACTGCGTGGAGCAGGCCGAATCTATAAGACGGTACAGTCCGATGGAGTGTGCAACTCG ACTCCGTGAAGCTGGAATCGCTAGTATCGGATATCAGGCCATGATCCGGTGAATACGTTCCGGCCTGTACACACCGC CCGTCAAGCCATGGAAGCTGGGGTACCTGAAGACGGTACCGCAAGGAGCTGTTAGGGTAAACTAGTACTGGGCT

Supplementary Table 69. 16S rDNA sequences (1,462 bp) of Capnocytopha sp. KCOM 2629

Sequences (5' > 3')

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ATTGAACGCTGGCGCAGGGTTAACACATGCAAGTCGAACGGTAACATAAAGAAGCTGCTTGTGAGCAGTGCG
GACGGGTGAGTAATGCTTGGGAAATCTAGCTTATGGAGGGGATAACTACGGGAAACTGTAGCTAATACCGCGTAA
ATATCGAAAGATTAAGATGTGGGACCTCGGGCCACATGCCATAGGATGAGCCCAAGTGGGATTAAGGTAGTTGGT
GAGGTAAAGGCAGCAGTCTAGCTGGTCTGAGAGGTGACCAGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG
TCACCAAGCCGACGATCTAGCTGGTCTGAGAGGTGACCAGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG
GAGGCAGCAGTGGGAAATATTGCGCAATGGGGCAACCTGACGCAGGCCATGCCGCGTAAATGAGACAGGGCCTTGGGTT
GTAAAGTTCTCGGTAGCGAGGAAGGCATTAGTTAATAGACTAGATGATTGACGTTAACTACAGAAGAAGCACCGC
TAACCTCGTGCAGCAGCCGGTAATACGGAGGTGCGAGCGTTAACCTGGGAAATTCGAAATAACTGGGCTAAAGGGCAC
GCGCAGGGTGTGAGGTGTGAAAGCCCCGGCTTAACCTGGGAAATTGCAATTCTACAGGGTGTGAGAGTACTTGGGAA
GGGGTAGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTGGAGGAATACCGAAGGCAGGGCAGCCCCTGGGAA
TACTGACGCCATGTGCAAAGCGTGGGAGCAAACAGGATTAGATAACCTGGTAGTCCACGCTGAAACGATGTCGATT
TGGGGTTGAACCTTGAGTTGGCGCCCGTAGCTAACGTTGGAATTCGACCGCCTGGGAGTACGGCGCAAGGTAAAA
CTCAATGAATTGACGGGGCCCGACAACGGGTGGAGCATGTTAACCTGGGAAATTGCAACCGCAAGAACCTTACACT
CTTGACATCCAGAGAACTTCCAGAGATGGATTGGTGCCTCGGGAACTCTGAGACAGGTGCTGCATGGCTGTCAGC
TCGTGTTGTGAAATGTTGGGTAAGTCCCACGAGCGCAACCCATTACCTTGTGCGAGCGATTCGGTGGGAA
AAAGGAGACTGCCGTGATAAACCGGAGGAAGGTGGGATGACGTCAAGTCATCATGCCCTACGAGTAGGGCTACACA
CGTGTACAATGGGTATAACAGAGGGAAAGCGAGGTGCGAGCGTGGAGCGAATCTACAAAGTAGCTAAGTCCGGATT
GAGTGTGCAACTCGACTCCATGAAAGTCGAAATCGTAGTAATCGAAATCAGAATGTTGGGTGAAATACGTTCCGGG
TTGTACACACCGCCGTACACCATGGGAGTGGGTGACCGAGTAGATAGCTAACCTCGGGGGGCTTACAC
GGTATGATTGACTGGGTG

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Supplementary Table 70. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2645

Sequences (5' > 3')

```

ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGAACGGCAGCACAGAGAAGCTGCTTCTGGGTGGCGAGTGCG
AACGGGTGAGTAACATATCGAACGTAACGGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGACCTCGGGCCTGCGTTATCGAGCGGCCATATCTGATTAGCTAGTTGGTGGGAAAGGC
CTACCAAGCCGACGATCAGTAGCGGGCTGAGAGGTGATCCGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG
GAGGCAGCAGTGGGAAATTGGACAATGGGTGCAAGCCTGATCCAGGCCATGCCGCGTCTGAAGAAGGGCCTTGGGTT
GTAAAGGACTTTGTAGGGAAAGAAAAGGAAAGGGTTAACCTCGTGTGACGGTACCTGAAGAATAAGCAGCGC
TAACTACGTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACGAAATTACTGGGCGTAAGCGAGCGAGAC
GTTACTTAAGCAGGATGTGAAATCCCCGGCTAACCTGGAACTCGTCTGAACCTGGTACTGGTGAAGATGTGTCAGAGG
GAGGTAGAATTCCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTCATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGCTAGCGTAGTAACCGTGAATGACCGCCTGGGAGTACGGTGCAGGATTA
AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTAACTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTAGAGACAGGGAGGTGCTTCTGGGAGCGTAACACAGGTGCTGCATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTAAGTCCGCAACGAGCGCAACCCCTGTGATTAGTGGCATCTTGTGACTGGGCACT
CTAATGAGACTGCCGTGACAAGCCGGAGGAAGGTGGGAGTACGTCAAGTCCTCATGCCCTATGACCGAGGCTTCAC
ACGTCAACATGGTGGTACAGAGGGTAGCCAAGCCCGAGGTGGAGCGAACATCTCACAAAACCGATCGTAGTCCGGATT
GCACTGCGCAACTCGAGTGCATGAAGTCGAAATCGTAGTAATCGCAGGTGAGCATACTCGGGTGAATACGTTCCGGGT
CTTGTACACATCGCCCGTACACCATGGGAGTGGGGATACCGAGTAGTAGGTAGGGTAACCGTAAGGAGCCCCTACCA
CGGTATGCTTACGACTGGGTG

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Supplementary Table 71. 16S rDNA sequences (1,440 bp) of Capnocytopha sp. KCOM 2590

Sequences (5' > 3')

GATGAACGCTAGCGGCCGCTAACACATGCAAGTCGAGGGGGAGGTTACTTCGGGTAACTGAGACCCGCGTACGGGTG
CGTAACCGGTATAACATCGCTTCACTGGGGATAGCCGAAGAAATTGGATAATACCCCATAGTATATAAGGACG
GCATCGTTTATATTAAAGCTTAGGTTGAAAGATGAGTATGCGTTCTATTAGCTAGTTGGAGAGGTAACGGCTCCCC
AAGGCGATQATAGATAGGGGTTCTGAGAGGGTGTCCCCCACCTGGTACTGAGATACGGACCAGACTCTACGGGAGGC
AGCAGTGAGGAATATTGACAATGGTCGGAAGACTGATCCAGCATGCGCGTGCAGGATGAAGGTCTATGGATTGAA
ACTGCTTTGTAAGGAGAATAAGAGCTACGTGATGTTGATGACGGTACCTTGAATAAGCATGGCTAACTCCGTG
CCAGCAGCGCGGTAAACGGAGGATGCGAGCGTTACCGGAATCATTGGGTTAAAGGGTCTGAGGCGGCTTGTAAAG
TCAGAGGTAAAGCGCTCAGCTCAACTGAGCAACTGCCATTGAAACTGTTGGTCTGAAATGATTGTAAGTATTGAAAT
GTGTAGTGTAGCGGTGAAATGTCAGATATTACACAGAACCCGATAGCGAAGGCATATTACTAACAAATTGATTGACGT
GATGGACCAAAGCGTGGGGAGCGAACAGGATTAGATACCCGTTAGTGTGCTAACCGTGTAAACGATGGATACTAGCTGTTGG
TTAAGGATTGAGTGGCTAACGCAAAGTGATAAGTATCCCACCTGGGGAGTACGTTGCAAGAATGAAACTCAAAGGAAT
TGACGGGGGCCCGACAAGCGTGGAGCATGTTAATTGATGATACCGAGGAACCTACCAAGGTTAAATGGGG
ACTGACAGGGTAGAGATACCTTTCTCGGACAGTTCAAGGTGTCGATGGTTGCTGAGCTCGGCCGAGGT
GTCAGGTTAAGTCTATAACGAGCGAACCCCTGCCATTAGTGTCTAACGAGTAGAGTCGAGGCCCTAAATGGACTGCC
GGTCAACAGGAGAGGAGGGATGACGTCAAATCATCACGGCCCTACATTTGGGCTACACAGTGCTACAATGG
CCGTTACAGAGAGCAGCCACTGCGTGAGCAGGCGGAATCTATAAAGACGGTCAGTTGGATCGGAGTCTGCAACTCG
ACTCCGTGAAAGCTGAAATCGCTAGTAACTGGATATCAGCCATGATCCGGTAATACGTTCCGGCCTTGACACACCCG
CCGTCAAGCCATGGAAGCTGGGGTACCTGAAGACGGTTACCGCGAGGAGCTGTTAGGGTAAAAGTACTGACTGGGGT

Supplementary Table 72. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2591

Sequences (5' > 3')

```
GATGAACGCTGACAGAAATGCTAACACATGCAAGTCAACTTGAACCTCGGTTGGTGCGGACGGGTGAGTAACCGTA  
AAGAACTTGCCTCACAGCTAGGGACAACATTGGAAACGAATGCTAATACCTGATATTATGATTATAAGGCATCTAGAA  
TTATGAAAGCTATACGCACTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGCATGTA  
TGGTAGCCGGCCTGAGAGGGTGAACGCCACAAGGGACTGAGACACGGCCCTACTCCTACGGGAGGAGCAGTGGGG  
AATATTGGACAATGGACCGAGAGTCTGATCCAGCAATTCTGTGTCAGATGAAGTTTCGGAATGTAAGTGTCTTCA  
GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGAAGTGAACGGCTAAATACGTGCCAGCAGCCGGTAATACGTATGTC  
ACGAGCGTTACCGGATTATTGGCGTAAAGCGCTAGGTGGTTAGTGAAGTCTGATGTGAAAATGCAAGGCTCAAC  
TCTGTATTGCGTGGAAACTGTATAACTAGAGTACTGGAGAGGTAAGCGGAACATAAGTGTAGAGGTGAAATTGCTAGA  
TATTGTAGGAATGCGATGGGAAGCCAGCTTACGGACAGATACTGACGCTGAAGCGCAAAGCGTGGTAGCGAAC  
GGATTAGATACCCCTGGTAGTCCACGCCGTAACGATGATTACTAGGTGTTGGGGTCGAACCTCAGCGCCCAAGCAAAC  
CGATAAGTATCCGCTGGGGAGTACGTACGCAAGTATGAAACTCAAAGGAATTGACGGGGACCCGACACGCCGTTGAG  
CATGTGGTTATTGACGCAACCGAGGAACCTTACAGCGTTGACATCTTAGGAGTGAGATAGAGATATTCTAGTGT  
CCCTTCGGGAAACCTAAAGACAGGGTGCATGGCTTGTGAGCTGTCGAGATGTTGGGTTAAGTCCCGCAAC  
GAGCGCAACCCCTTGTATGTTACCATTAAGTGGGACTCATGCGATACTGCCTGCGATGAGCAGGAGGAAGGTG  
GGGATGACGTCAAGTCATCATGCCCTTACGCTGGCTACACAGTGTACAATGGATAGAACAGAGAGTCGAAAGC  
TGTGAAGTGGAGCTAATCTAGAAAATCTTCTAGGTTGGATTGACTCTGCACTCGAGTACATGAAGTGGATTCG  
TAGTAATCGCAATCAGCAATGTCGGGTGAATACGTTCTCGGGTCTGTACACACCAGCCGTACACACCAGAGTGG  
TTGCACCTGAAGTAGCAGGGCTAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGGT
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Supplementary Table 73. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2594

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTAACACATGCAAGTCAACTGAACTTCGGTTGGGTGGCGGACGGGTGAGTAACCGCGTA AAGAACTTGCCCTCACAGATAGGGACAACATTGGAAACAGAATGCTAACACCTGATATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCACTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGCATG TGGGTAGCCGCCCTGAGAGGGTGTGAGGCCACAAGGGGACTGAGACACGGCCCTACTCCTACGGGAGGCAGCTGGGG AATATTGGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACAGTGAAGTTTCGGAATGTAAGTGCTTCA GTTGGGAAAGAAAAAAATGACGGTACCAACAGAAGTGACGGCTAAATACGTGCCAGCAGCCGCGTAATACGTATGTC ACAAGCGTTATCCGGATTATTGGCGTAAAGCGCGTAGGTGGTTATGTAAGTCTGATGTGAAAATGCAGGGCTCAAC TCTGTATTGCGTTGGAAACTGTGTAACTAGAGTACTGGAGAGGTAAGCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAACGCGAAAGCGTGGGTAGCAAAC GGATTAGATAACCTGGTAGTCCACGCCGAAACGATGATTACTAGGTGTTGGGGTCAACCTCAGGCCAACGAAAC CGATAAGTAATCCGCTGGGAGTACGTACGCAAGTATGAAACTCAAAGGAATTGACGGGACCCGACAAGCGTGGAG CATGTGGTTAATTCGACGCAACCGGAGAACCTTACCGCGTTGACATCTAGGAATGAGACAGAGATGTTAGTGT CCCTCGGGGAAACCTAAAGACAGGTGGCATGGCTGCTCGTCACTGTCGTGAGATGTTGGGTAAGTCCCAC GAGCGCAACCCCTTCGTATTTACCATTAAGTGGGACTCATGGCTGCGATGAGCAGGAGGAGGTG GGGTGACGTCAGTCATCATGCCCTTACGCTGGGCTACACACGTGCTACAATGGGTAGTACAGAGAGTCGCAAAC CGTGGAGTGGAGCTAATCTAGAAAATCTTACGCTGGGATGCTGCAACTCGAGTACATGAAGTGGATCG TAGTAATCGCGAATCAGCAATGTCGCGGTAAATACGTTCTCGGTCTGTACACACCAGCGTACACACGAGAGTTGG TTGCACCTGAAGTAGCAGGCCAACCGTAAGGAGGGATGCTCCAGGGTGTGATTAGCGATTGGGTG

Supplementary Table 74. 16S rDNA sequences (1,440 bp) of Capnocytopha sp. KCOM 2595

Sequences (5' > 3')
GATGAACGCTACGGCGAGGCCAACACATTCAAGTCGAGGGGAGGTTACCTTCGGTAACTGAGACCGCGTACGGTG CGTAAACCGCTATAACATCTGCCCTCACTGGGGATAGCCGAAGAAATTGGATTAATACCCATAGTATAGGGACG GCATCGTTTATATTAAAGCTAGGTGGAAAGATGAGTATGCTTCTATTAGCTAGTGGAGAGGTAACGGCTCCCC AAGGCATGATAGATAGGGTCTGAGAGGGATGCCCCAACACTGGTACTGAGATAACGGGACAGACTCCTACGGGAGGC AGCAGTGGAAATATTGGACAATGGTGGAAAGACTGATCCAGCCATGCCGCGTGAGGATGAAAGTCTATGGATTGAA ACTGCTTTGTAAGGAAGAATAAGAGCTACGTGAGTTGATGACGGTACCTTATGAATAAGCATGGCTAACCGTG CCAGCAGCCGCGTAATACGGGATGCGAGCGTATCCGAATCATTGGTTAAAGGGTCTGTAGGCGGGCTTGTAG TCAGAGGTGAAAGCGCTCAGCTCAACTGAGCAACTGCCCTGAAACTGTTGCTTGAATGATTGTAAGTAGTTGAA GTGTAGTGTAGCGGTGAAATGCTTAGATATTACAGAACCCGATAGCGAAGGCATATTACTAACAAATTGATTGACGCT GATGGACGAAAGCGTGGGGAGCGAACAGGATTAGATAACCCCTGGTAGTCCACGCTGTAACGATGGATACTGCTTGG TTAAGGATTGAGTGGCTAACGAAAGTGTAAAGTACCTCCACCTGGGAGTACGTTGCAAGAATGAAACTCAAGGAAT TGACGGGGGCCGACAAGCGGTGGAGCATGTGTTAATCGATGATACGCGAGGAACCTTACCAAGGTTAAATGGGG ACTGACAGGGGAGAGAATACCTTTCTCGGACAGTTCAAGGTGCTGATGGTGTGCTGAGCTCGTGGAGGT GTCAGGTTAACGCTATAACGAGCGAACCCCTGCCATTAGTGTCAACGAGTCGAGTCGAGCCCTAATGGGACTGCC GGTCAAGAGAGCAGCCACTGCGTGAGCAGGCGCAATCTATAAAGACGGTACAGTCGGATGGAGTCTGCAACTCG ACTCCGTGAAGCTGGAATCGCTAGTAATCGGATATCAGCCATGATCCGGTGAATACGTTCCGGCTTGTACACACCGC CCGTCAAGCCATGGAAGCTGGAGTACCTGAAGACGGTACCTAAAGGAGCTGTTAGGGTAAACTAGTGACTGGGCT

Supplementary Table 75. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2596

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTGAACTTCGGTTGGGTGGCGGACGGGTGAGTAACCGCTA AAGAACCTGCCAACAGATAGGGACAACATTGAAACAGAATGCTAACCTGTATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGCAGTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACGGCTACCAAGGGATGA TGGGTAGCCGCCCTGAGAGGGTATCGGCCACAAGGGACTGAGACACGCCCTACTCCTACGGGAGGCAGCTGGGG AATATTGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACAGTGAAGTTTCGGAATGTAAGTGCTTCA GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGAACGGCTAAATACGTGCCAGCAGCCCGTAATACGTATGTC ACAAGCCTTATCCGGATTATTGGCGTAAAGCGCTAGGTGGTTATGTAAGTCTGTGAGAAATGCAGGGCTCAAC TCTGTATTGCGTTGGAAACTGTGTAACTAGAGTACTGGAGAGGTAAGCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAACGCGAAGCGTGGTAGCAAACA GGATTAGATAACCTGGTAGTCCACGCCGTAACAGTGTATTACTAGGTGTTGGGGTCAACCTCAGGCCAACGAAACG CGATAAGTAATCCGCTGGGAGTACGTCAGCAAGTGTGAAACTCAAAGGAATTGACGGGACCCGACAAGCGTGGAG CATGTGGTTAATCGACGCAACCGGAGAACCTTACCGCTTGCAGCTCGTGTGAGATGTTGGGTAAGTCCCAC CCCTCGGGGAAACCTAAAGACAGGTGGCATGGCTGCTCGTGTGAGATGTTGGGTAAGTCCCAC GAGCGCAACCCCTTCGTATGTTACCATCTTAAGTGGGACTCATCGCATACTGCCCTGCGATGAGCAGGAGGAGGTG GGGATGACGTCAGTCTGATGCCCTTACGCTGGGCTACACACGTGTACAATGGTAGTACAGAGAGTCGCAAAC CGTGGAGTGGAGCTAATCTAGAAAATTTCTAGTTCGGATTGTACTCTGCAACTCGAGTACATGAAGTTGGATCG TAGTAATCGCGAATCAGCAATGTCGCGGTAAACGTTCTCGGGTCTGTACACACCAGCCGTACACACCAGAGAGTTGG TTGCACCTGAAGTAGCAGGCCAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTG

Supplementary Table 76. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2597

Sequences (5' > 3')
GATGAACGCTGACAGAATGCTTAACACATGCAAGTCAACTGAACTTCGGTTGGGTGGCGGACGGGTGAGTAACCGCTA AAGAACCTGCCAACAGATAGGGACAACATTGAAACAGAATGCTAACCTGTATTGATTTAGGGCATCCTAGAA TTATGAAAGCTATATGTGCTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAACAGCTACCAAGGGATGA TGGGTAGCCGCCCTGAGAGGGTATCGGCCACAAGGGACTGAGACACGCCCTACTCCTACGGGAGGCAGCTGGGG AATATTGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGTGACAGTGAAGTTTCGGAATGTAAGTGCTTCA GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGTGAACGGCTAAATACGTGCCAGCAGCCCGTAATACGTATGTC ACAAGCCTTATCCGGATTATTGGCGTAAAGCGCTAGGTGGTTATGTAAGTCTGTGAGAAATGCAGGGCTCAAC TCTGTATTGCGTTGGAAACTGTGTAACTAGAGTACTGGAGAGGTAAGCGGAACTACAAGTGTAGAGGTGAAATTGCTAGA TATTGTAGGAATGCCGATGGGAAGCCAGCTTACTGGACAGATACTGACGCTGAAGTGCAGCGAAGCGTGGTAGCAAACA GGATTAGATAACCTGGTAGTCCACGCCGTAACAGTGTATTACTAGGTGTTGGGGTCAACCTCAGGCCAACGAAACG CGATAAGTAATCCGCTGGGAGTACGTCAGCAAGTGTGAAACTCAAAGGAATTGACGGGACCCGACAAGCGTGGAG CATGTGGTTAATCGACGCAACCGGAGAACCTTACCGCTTGCAGCTTGCAGCTCGTGTGAGATGTTGGGTAAGTCCCAC CCCTCGGGGAAACCTAAAGACAGGTGGCATGGCTGCTCGTGTGAGATGTTGGGTAAGTCCCAC GAGCGCAACCCCTTCGTATGTTACCATCTTAAGTGGGACTCATCGCATACTGCCCTGCGATGAGCAGGAGGAGGTG GGGATGACGTCAGTCTGATGCCCTTACGCTGGGCTACACACGTGTACAATGGTAGTACAGAGAGTCGCAAAC CGTGGAGTGGAGCTAATCTAGAAAATTTCTAGTTCGGATTGTACTCTGCAACTCGAGTACATGAAGTTGGATCG TAGTAATCGCGAATCAGCAATGTCGCGGTAAACGTTCTCGGGTCTGTACACACCAGCCGTACACACCAGAGAGTTGG TTGCACCTGAAGTAGCAGGCCAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGTG

Supplementary Table 77. 16S rDNA sequences (1,428 bp) of Capnocytopha sp. KCOM 2598

Sequences (5' > 3')

GATGAACGCTGACAGAACTGCTTAACACATGCAAGTCACCTGAACTTGGTTGGCGACGGGTGAGTAACCGCTA
AAGAACTTGCTCACGGCTAGGGACAACATTGAAACGAATGCTAACCTGATATTATGATTTAGGCATCCTAGAA
TTATGAAAGCTATATGCACTGTGAGAGAGCTTGCCTCCATTAGCTAGTGGAGAGGTAAACGGCTCACCAAGGCGATGA
TGGGTAGCGGCCQTAGAGGGTATCGGCACAAGGGACTQAGACACGGCCCTACTCCTACGGGAGGCAGCAGTGGGG
AATATTGGACAATGGACCAAGAGTCTGATCCAGCAATTCTGTGACGATGAAGTTTCGGATGTAAGTGTCTTCA
GTTGGGAAGAAAAAAATGACGGTACCAACAGAAGAAGTGAACGGCTAAATACGTGCCAGCAGCCGGTAATACGTATGTC
ACAAGCGTTATCCGGATTATTGGCGTAAAGCGCTAGTGGTTATGTAAGTCTGATGTGAAAATGCAGGGCACAC
TCTGTATTGCGTTGAAACTGTAACTAGAGTACTGGAGAGGTAAACGGAACTACAAGTGTAGAGGTGAAATTGCTAGA
TATTGCTAGGAATGCCATGGGAAGCCGCTTACTGGACAGATACTGACGCTGAAGCGCGAACGCGTGGCAGCAAACA
GGATTAGATACCTGGTAGTCCACGCCGTAACGATGATTACTAGTGTGGGGTCAACCTCAGCGCCAAGCAAACG
CGATAAGTATCCGCTGGGGAGTACGTACGCAAGTATGAAACTCAAAGGAATTGACGGGGACCCGACAAGCGTGGAG
CATGTGGTTAATTGCGACGCAACCGAGGAACCTTACCGCGTTGACATCTTAGGAATGAGACAGAGATGTTCTAGTGT
CCCTTCGGGAAACCTAAAGACAGGTGGCATGGCTGTCGTCAGCTCGTGTGAGATGTTGGTTAAGTCCCAC
GAGCGCAACCCCTTCGTATGTTACCATCATTAAGTGGGACTCATGCGATACTGCCTCGCATGAGCAGGAGGAAGGTG
GGGATGACGTCAGTCATCGCCCTTACGCTGGCTACACACGTCTACAATGGTAGTACAGAGAGTCGCAAC
CGTGGAGGAGCTAACTCAGAAAACATTCTTAGTGGATTGACTCTGCAACTCGAGTACATGAAGTTGAAATCGC
TAGTAATCCGAATCAGCAATGTTGGGTAAATACGTTCTCGGGCTTGTACACACCCCGTACACACCAGAGACTGG
TTGCACCTGAAGTAGCAGGCCAACCGTAAGGAGGGATGCTCCGAGGGTGTGATTAGCGATTGGGGT

Supplementary Table 78. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2630

Sequences (5' > 3')

ATTGAACGCTGGCGGCATGTTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTTGGGTGGCGAGTGGCG
AACGGGTAGTAACATACGGAACGTAACGGAGTAACTGGGGATAACTAATCGAAAGATTAGCTAATACCGCATATTCTCT
GAGGAGGAAAGCAGGGACCTTCGGGCCTGCGTTATTCGAGCGGGCGATACTGATTAGCTAGTTGGTGGGTAAAGGC
CTACCAAGGCGACGATCAGTAGCGGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGCCAGACTCCTACGG
GAGGCAGCAGTGGGAATTGGACAATGGCGCAAGCCTGATCCAGCATGCCGCTGTCTGAGAAGGCCTCGGGT
GTAAAGGACTTTGTCAGGGAAAGAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAGAATAAGCACCGGC
TAACTACGTGCCAGCAGCCGCGTAATACGTAGGGTGCAGCGTAATCGGAAATTACTGGGCTAAAGCAGCGCAGACG
GTTACTTAAGCAGGATGTGAAATCCCCGGGCTAACCTGGGAACTGCGTCTGAACTGGGTGACTAGAGTGTGTCAGAGG
GAGGTAGAATTCCACGTGTAGCAGTGAATGCGTAGAGATGTGGAGGAATACCGATGGCGAAGGCAGCCTGGATAA
CACTGACGTTCATGCTGAAAGCGTGGTAGCAAACAGGATTAGATACCCCTGGTAGTCCACGCCAACGATGTCATT
AGCTGTTGGCAACTGATTGCTTAGTACGCTAGCTAACCGCTGGAGTACGGTCAAGGATAAACCTTACCTG
AACTCAAAGGAATTGACGGGACCCGCAACAGCGTGGATGATGTGTTAACCGATGCAACCGGAAGAACCTTACCTG
GTCTTGACATGTACGGATCCTCAGAGACGGAGGATGCCCTGGGAGCGTAACACAGGTCTGCATGGCTGCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCACAGAACGCAACCCCTGTCATTAGTTGCCATCATTTAGTTGGGCACT
CTAATGAGACTGCCGGTACAAGGCCAGGGTAGCCAAGGCCGAGGTGGAGCAATCTCACAAACCGATGCTAGTCCGGATT
ACGTCATACAATGGTGGTACAGAGGGTAGCCAAGGCCGAGGTGGAGCAATCTCACAAACCGATGCTAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGGAAATGCCAGTAACTGAGTGGGGATACCAGAAGTAGGTAGGGTAAACCG
CTTGTACACACCGCCCGTCACCATGGGAGTGGGGATACCAGAAGTAGGTAGGGTAAACCGCAAGGAGGCCGTTACCA
CGGTATGCTCATGACTGGGGT

Supplementary Table 79. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2646

Sequences (5' > 3')

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ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGATGACTAACCGCCATCTGATGAGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGAACGCTGATCCAGGCCATGCCGCTGTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGAGGGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATGGGAGGAAACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTAGTACCGTGAACCGCAGGATGGGAGGAAACCGATGGCTGAGACCGCCCTGGGATAA
AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGAGGATTAATTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGGGAGGTGCCTCGGGAGCGTAACACGGTGTGCTGATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCAATTAGTTGCCATCTTAGTGGGACT
CTAATGAGACTGCCGGTGAACAGCCGGAGGAAGGTGGGAGTACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTCACTACAATGGTGGTAGCAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGGTACGGTACGGT
CTTGTACACACGGCCCGTCAACCATGGAGTGGGAGTACCAAGAAGTAGGTAGGTAACCGCAAGGAGCCCCTACCA
CGGTATGCTTACGACTGGGTG

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Supplementary Table 80. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2635

Sequences (5' > 3')

```

ATTGAACGCTGGGGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAACGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTACCGAGTAATGGGGATAACTAATCGAAAGATTAGCTAACCGCATATTCTCT
GAGGAGGAAAGCAGGGGACCTCGGGCTTGCCTTATTGAGGGATGACTAACCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
CTACCAAGGGCAGCATCAGTAGCGGGCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCTACGG
GAGGCAGCAGTGGGAATTTGGACAATGGGCGAACGCTGATCCAGGCCATGCCGCTGTGAAGAAGGCCTTGGGTT
GTAAAGGACTTTGTCAAGGAAGAAAAGGACAGGGTTAACCTCTGTTGATGACGGTACCTGAAGAATAAGCACCAGC
TAACTAGCTGCCAGCAGCCGGTAATACGTAGGGTGCAGCGTTAACCGAATTACTGGGCTAAAGCGAGCGCAGACG
GTTACTTAAGCAGGATGTGAATCCCCGGCTAACCTGGGACTGCTGAGGGTACGGTACTGGGAGTGTGAGGAGGTGTGAGG
GAGGTTAGAATTCACGTGTAGCAGTGAATGGGAGGAGATGGGAGGAAACCGATGGCGAAGGCAGCCTCTGGGATAA
CACTGACGTTATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATAACCTGGTAGTCCACGCCCTAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGTACCGTAGTACCGTGAACCGTGAACCGCAGGATGGGAGTACGGTGTGCAAGGATTA
AACTCAAAGGAATTGACGGGACCCGCACAAGCGGTGGATGATGTGAGGATTAATTCGATGCAACCGCAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACAGGGAGGTGCCTCGGGAGCGTAACACGGTGTGCTGATGGCTGTCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGTCAATTAGTTGCCATCTTAGTGGGACT
CTAATGAGACTGCCGGTGAACAGCCGGAGGAAGGTGGGAGTACGTCAAGTCCTCATGGCCTTATGACCAGGGCTTCAC
ACGTCACTACAATGGTGGTAGCAGAGGGTAGCCAAGCCGGAGGTGGAGCCAATCTCACAAAACCGATGTAAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTCGAATCGTAGTAATCGCAGGTAGCATACTGGGTGATACTGGGTACGGTACGGT
CTTGTACACACGGCCCGTCAACCATGGAGTGGGAGTACCAAGAAGTAGGTAGGTAACCGCAAGGAGCCCCTACCA
CGGTATGCTTACGACTGGGTG

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Supplementary Table 81. 16S rDNA sequences (1,485 bp) of Capnocytopha sp. KCOM 2636

Sequences (5' > 3')

```
GACGAACGCTGGCGCGTGTAAACACATGCAAGTCGAACGAAGAGCGATGGAAGGCTGCTCTATCAATCTTAGTGGCG
AACGGGTGAGTAACCGTAATCACCTGCCCTCAGAGGGGACAACAGTTGAAACGACTGCTAATACCGCATACGATC
TAACCTGGCATCGAGGATAGATGAAAGGTTGGCCTATTATAAGCTATCACTGAAGGAGGGATTGGCTGATTAGC
TAGTTGGAGGGTAACGGCCCACCAAGGCATGATCAGTAGCCGGTCTGAGAGGATGAACGGCCACATTGGGACTGAGAC
ACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGAATCTTCCGCAATGGACGAAAGCTGACGGAGCAACGCCGCTGAG
TGATGACGGCCTCGGGTTGAAAGCTGTAACTCGGACGAAAGGCCCTTGGCAATAGTTAGAAGGATTGACGGTA
CCGGAAATAGAAAGCCACGGCTAACTACGTGCCAGCAGCCGGTAATACGTAGGTGCAAGCGTTGCGGAAATTATTGG
GCGTAAAGCGCGCGCAGGGATTGGTAGTCTAAAAGCTGGGCTTAACCCGTATGGGATGGAAACTGCA
ATCTAGAGTATCGGAGAGGAAAGTGAATTCTCTAGTGTAGCGGTGAAATCGTAGATATTAGGAAGAACACCAGTGGCGA
AGGCAGCTTCTGGACGAAACTGACGCTGAGGCGCAGAGCCAGGGAGCGAACGGGATTAGATACCCCGTAGTCCTG
GCCGTAACCGATGGTACTAGGTGAGGGTATCGACCCCTCTGTGCCGAGTTAACGCAATAAGTACCCGCTGG
GAGTACGACCGCAAGGTTGAAACTCAAAGGAAATTGACGGGGCCGACAAGCGGTGGAGTATGTGTTAATTGACGC
AACCGCAAGAACCTTACCAAGGTCTGACATTGATGGACAGAACTAGAGATAGTTCTCTCGGAAGGCCAGAACAG
GTGGTGACGGTTGTCGTGACGTGAGATGTTGGGTTAAGTCCGCAACCGAGCGAACCCCTATCTTATGTT
CCAGCACTCGGGTGGGAACTCATGAGAGACTGCCGAGACAATGCCGAGGAAGGCCGAGTGACGTCAAATCATCATGC
CCCTTATGACCTGGCTACACAGTACTACAATGGGAGTTAAGACGGAAGCAATCCGAGGTTGAGCAACCCGAG
AAACACTCTCTCGGTGATCGTAGGTGCAACTGCCCTACGTGAAAGTCCAATCGCTAGTAATCGCAGGTAGCATA
TGGGTGAATAGTCCGGGCTTGTACACACCGCCGTCACACCAGAAAGTCCAAGGCCGTGGGTA
ACCTTCGGGAGCCAGCGCTAAGGTAAGTCGATGATTGGGTT
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Supplementary Table 82. 16S rDNA sequences (1,463 bp) of Capnocytopha sp. KCOM 2637

Sequences (5' > 3')

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ATTGAACGCTGGCGCATGCTTACACATGCAAGTCGGACGGCAGCACAGAGAAAGCTTGCTCTGGGTGGCGAGTGGCG
AACGGGTGAGTAACATATCGAACGTAACGGAGTAATGGGGATAACTAATCGAAAGATTAGCTAATACCGATATTCTCT
GAGGAGGAAAGCAGGGACCTCGGGCCTGCGTTACCGGGCCGATATCTGATTAGCTAGTTGGTGGGTTAAGGC
CTACCAAGCGACGATCAGTAGCGGTCTGAGAGGATGATCCGCCACACTGGGACTGAGACACGGCCAGACTCCTACGG
GAGGAGCAGTGGGAAATTGGACAATGGCGCAAGCTGATCCAGCCATGCCGCTGTCTGAAGAAGGCCCTGGGTT
GTAAAGGACTTTGTAGGGAGAAAAGGACAGGGTTAATACCTCTGTTGATGACGGTACCTGAAGAATAAGCAGCGC
TAACTACGTGCCAGCGCAGCCGGTAATACGTAGGGTAGCGCTTAACGGAAACTGCCGTTGACTAGGGTGA
GTTACTTAAGCAGGATGTGAATCCCCGGCTCACCTGGAACTGCCGTTGACTAGGGTGA
GAGGTAGAATTCCACGTGAGCAGTGAATGCGTAGAGATGTGGAGGAATCCGATGCCAAGGCCCTGGGATAA
CACTGACGTTCATGCTCGAAAGCGTGGTAGCAAACAGGATTAGATACCCCTGGTAGTCCACGCCCTAAACGATGTCATT
AGCTGTTGGGAACTTGATTGCTTAGCTAGCGTAGCTACCGTAGAAATTGACGCCCTGGGAGTACGGTCGCAAGATTAA
AACTCAAAGGAAATTGACGGGACCCGCACAAGCGGTGGATGATGTGGATTATTCGATGCAACGCGAAGAACCTTACCTG
GTCTTGACATGACGGAACTCTCAGAGACGGAGGTGCTTGGGAGCGTAACACAGGTGCTGATGGCTGCGTCA
GCTCGTGTGAGATGTTGGGTTAAGTCCGCAACGAGCGCAACCCCTGTCATTAGTGTGCTCATTTAGTGGGACT
CTAATGAGACTGCCGGTACAAGCCGGAGGAAGGTGGGAGTACGTCAAGTCCTCATGCCCTTATGACCGAGGGCTTAC
ACGTCAACATGGTCGGTACAGAGGGTAGCCAAGCCCGAGGTGGAGCCAATCTCACAAAACCGATCGTAGTCCGGATT
GCACTCTGCAACTCGAGTGCATGAAGTGCAGTGAATCGTAGTAATCGCAGGTAGCATACTGCCGTGATACTGTTCCGGGT
CTTGTACACACCGCCCGTCACACCATGGGAGTGGGGATACCGAGAAGTAGGTAGGGTAACCGCAAGGAGCCGCTACCA
CGGTATGCTTACGACTGGGTG
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