Table S1. Comparison of detected bacteria between the conventional cultivation methods and clone library method in BALF and sputum specimens

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Age (yr)/Sex | Clone Library Method of 16S ribosomal RNA gene  | 　 | Conventional Cultivation Methods |
| Cell number (cells/mL) | BALF |  | BALF | 　 | Sputum |
| Predominant phylotype (Clones/clones, %) | 　 | Gram stain | Cultivation | 　 | Gram stain | Cultivation |
| 1 | 68/M | 6.2×104 | *Streptococcus oralis*9/30, 30.0% |  | (-) | No growth |  | GPC,GPR, GNR | No growth |
| 2 | 70/F | 3.1×104 | *Streptococcus pneumoniae*17/35, 48.6% |  | GPC | *Streptococcus pneumoniae* |  | GPC,GPR, GNC | *Streptococcus pneumoniae,* |
| *Streptococcus* species, |
|  |  |  |  |  |  |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  |  |  |  | *Neisseria* species |
| 3 | 77/M | 7.1×107 | *Streptococcus pneumoniae*47/47, 100% |  | GPC | *Streptococcus pneumoniae* |  | GPC,GPR,GNC,GNR | *Streptococcus pneumoniae* |
| 4 | 57/M | <104 | (-) |  | (-) | No growth |  | N.A. |  |
| 5 | 65/F | <104 | (-) |  | (-) | No growth |  | N.A. |  |
| 6 | 67/M | 1.2×104 | *Pseudomonas aeruginosa* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 45/64, 70.3% |  |  |  |  |  |  |
| 7 | 86/M | 3.7×106 | *Streptococcus intermedius*62/65, 95.4% |  | (-) | *Streptococcus constellatus* |  | GPC,GPR,GNC,GNR | No growth |
| 8 | 38/M | 8.7×106 | *Neisseria perflava*16/49, 32.7% |  | GPC,GPR,GNC,GNR | *Neisseria* species |  | GPC | *Streptococcus* species |
| 9 | 60/M | 2.5×105 | *Streptococcus oralis* |  | GNR | No growth |  | GPC, GNR | No growth |
|  |  |  | 8/54, 14.8% |  |  |  |  |  |  |
| 10 | 73/M | 6.2×104 | *Porphyromonas* species |  | (-) | *Raoultella planticola* |  | N.A. |  |
|  |  |  | 50/76, 65.8% |  |  |  |  |  |  |
| 11 | 77/F | 2.5×105 | *Streptococcus intermedius* |  | GPC | No growth |  | N.A. |  |
|  |  |  | 41/74, 55.4% |  |  |  |  |  |  |
| 12 | 50/M | 1.2×105 | *Fusobacterium nucleatum* |  | (-) | No growth |  | GPR | No growth |
|  |  |  | 80/80, 100% |  |  |  |  |  |  |
| 13 | 62/M | 2.2×105 | *Parvimonas micra*30/54, 55.6% |  | (-) | No growth |  | GPC,GPR, GNR | No growth |
| 14 | 50/M | 5.0×105 | *Fusobacterium nucleatum*44/72, 61.1% |  | GPC,GPR,GNC,GNR | *Staphylococcus* species, |  | N.A. |  |
| *Streptococcus* species, |
|  |  |  |  |  |  | *Corynebacterium* species, |  |  |  |
|  |  |  |  |  |  | *Prevotella* species |  |  |  |
| 15 | 74/M | 6.2×105 | *Fusobacterium nucleatum* |  | GPC, GNR | *Streptococcus* species, |  | N.A. |  |
|  |  |  | 68/80, 85.0% |  |  | *Haemophilus influenzae,* |  |  |  |
|  |  |  |  |  |  | *Parvimonas micra* |  |  |  |
| 16 | 73/M | 3.5×107 | *Streptococcus intermedius* |  | (-) | No growth |  | GPC,GPR | No growth |
|  |  |  | 86/87, 98.9% |  |  |  |  |  |  |
| 17 | 67/M | 4.5×107 | *Parvimonas micra* |  | GPC,GNR | No growth |  | N.A. |  |
|  |  |  | 38/57, 66.7% |  |  |  |  |  |  |
| 18 | 59/M | 1.9×106 | *Fusobacterium nucleatum*43/57, 75.4% |  | GPC,GPR | *Staphylococcus aureus*(MSSA) |  | GPC, GPR | No growth |
| 19 | 45/M | 1.2×108 | *Dethiosulfovibrio* species44/83, 53.0% |  | GPC,GPR, GNR | *Prevotella* species |  | GPC,GPR,GNC,GNR | *Streptococcus* species |
| 20 | 63/M | 5.9×106 | *Fusobacterium nucleatum*46/50, 92.0% |  | GPC,GPR, GNR | *Streptococcus* species, |  | GPC,GPR,GNC,GNR | *Staphylococcus* species, |
| *Corynebacterium* species, | *Streptococcus* species, |
|  |  |  |  |  | *Haemophilus* species, |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  | *Actinomyces meyeri* |  |  | *Haemophilus* species, |
|  |  |  |  |  |  |  |  |  | *Neisseria* species |
| 21 | 57/M | 3.4×106 | *Fusobacterium nucleatum* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 88/88, 100% |  |  |  |  |  |  |
| 22 | 48/F | 3.1×104 | *Fusobacterium nucleatum* |  | GPC | *Streptococcus* species |  | N.A. |  |
|  |  |  | 32/79, 40.5% |  |  |  |  |  |  |
| 23 | 66/M | 1.9×105 | *Streptococcus intermedius* |  | GPC | *Streptococcus intermedius* |  | N.A. |  |
|  |  |  | 48/77, 62.3% |  |  |  |  |  |  |
| 24 | 71/M | 1.2×108 | *Eubacterium nodatum*19/58, 32.8% |  | GPR | No growth |  | GPC,GPR, GNR | No growth |
| 25 | 66/F | 3.1×104 | *Prevotella melaninogenica* |  | GPC,GNC, GNR | *Staphylococcus aureus,* |  | GPC,GPR,GNC,GNR | *Staphylococcus aureus,* |
| *Streptococcus* species, | *Streptococcus* species, |
|  |  |  | 49/73, 67.1% |  |  | *Haemophilus* species, |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  | *Neisseria* species, |  |  | *Haemophilus* species, |
|  |  |  |  |  |  | *Prevotella* species |  |  | *Neisseria* species |
| 26 | 67/M | 1.9×105 | *Streptococcus intermedius* |  | GPC | *Streptococcus* species |  | GPC, GPR | No growth |
|  |  |  | 90/90, 100% |  |  |  |  |  |  |
| 27 | 70/M | 1.0×108 | *Fusobacterium nucleatum* |  | (-) | *Streptococcus* species |  | GPC, GPR | *Streptococcus* species |
|  |  |  | 71/91, 78.0% |  |  |  |  |  |  |
| 28 | 59/F | 3.7×106 | *Parvimonas micra*54/84, 64.3% |  | GPC,GPR,GNC,GNR | *Staphylococcus* species, |  | N.A. |  |
| *Streptococcus* species, |
|  |  |  |  |  | *Corynebacterium* species, |  |  |  |
|  |  |  |  |  |  | *Haemophilus* species, |  |  |  |
|  |  |  |  |  |  | *Neisseria* species |  |  |  |
| 29 | 77/M | 3.1×104 | *Streptococcus intermedius*82/84, 97.6% |  | GPC,GNC, GNR | No growth |  | N.A. |  |
| 30 | 59/F | 1.8×107 | *Porphyromonas endodontalis* |  | GPC,GPR,GNC | *Streptococcus* species, |  | N.A. |  |
| *Neisseria* species, |
|  |  |  | 45/66, 68.2% |  |  | *Bacillus* species |  |  |  |
| 31 | 79/F | 4.1×108 | *Staphylococcus aureus* |  | GPC | *Staphylococcus aureus* |  | GPC,GNR | *Staphylococcus aureus,* |
|  |  |  | 70/76, 92.1% |  |  |  |  |  | *Streptococcus* species, |
|  |  |  |  |  |  |  |  |  | *Acinetobacter* species |
| 32 | 73/F | 2.5×104 | *Propionibacterium acnes* |  | GNR | *Haemophilus* species |  | N.A. |  |
|  |  |  | 5/53, 9.4% |  |  |  |  |  |  |
| 33 | 78/M | 3.9×107 | *Prevotella oris*71/78, 91.0% |  | GPC,GPR,GNR | *Staphylococcus* species, |  | GPC,GPR, GNR | *Staphylococcus* species, |
| *Streptococcus* species, | *Streptococcus* species, |
|  |  |  |  |  | *Corynebacterium* species |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  |  |  |  | *Enterobacter* species |
| 34 | 80/F | 5.6×107 | *Klebsiella variicola* |  | (-) | *Klebsiella pneumoniae* |  | GPC,GPR | *Staphylococcus* species, |
|  |  |  | 54/85, 65.1% |  |  |  |  |  | *Klebsiella pneumoniae,* |
|  |  |  |  |  |  |  |  |  | *Corynebacterium* species |
| 35 | 71/M | 6.2×104 | *Fusobacterium nucleatum*41/56, 73.2% |  | GPC | *Streptococcus* species |  | GPC,GPR,GNC,GNR | *Streptococcus* species, |
| *Corynebacterium* species, |
|  |  |  |  |  |  |  |  | *Neisseria* species |
| 36 | 73/M | 3.7×106 | *Klebsiella pneumoniae*62/91, 68.1% |  | GPC,GNR | *Staphylococcus aureus*(MRSA), |  | GPC,GPR, GNR | *Streptococcus* species, |
| *Corynebacterium* species, |
|  |  |  |  |  | *Klebsiella pneumoniae* |  |  | *Klebsiella pneumoniae,* |
|  |  |  |  |  |  |  |  |  | *Escherichia coli* |
| 37 | 70/M | 3.1×104 | *Fusobacterium nucleatum* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 9/62, 14.5% |  |  |  |  |  |  |
| 38 | 72/M | 1.4×106 | *Streptococcus oralis* |  | (-) | No growth |  | (-) | No growth |
|  |  |  | 34/90, 37.8% |  |  |  |  |  |  |
| 39 | 55/M | 2.7×105 | *Granulicatella adiacens* |  | (-) | No growth |  | GPC | *Streptococcus* species |
|  |  |  | 35/88, 39.8% |  |  |  |  |  |  |
| 40 | 83/M | 7.3×107 | *Streptococcus intermedius* |  | (-) | *Streptococcus* species, |  | N.A. |  |
|  |  |  | 38/68, 55.9% |  |  | *Corynebacterium* species |  |  |  |
| 41 | 73/M | 1.2×105 | *Streptococcus oralis*7/67, 10.5% |  | GPC,GPR, GNC,GNR | *Staphylococcus* species, |  | GPC,GPR, GNC,GNR | *Staphylococcus* species, |
| *Streptococcus* species, | *Streptococcus* species, |
|  |  |  |  |  | *Corynebacterium* species, |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  | *Haemophilus* species, |  |  | *Haemophilus* species, |
|  |  |  |  |  |  | *Neisseria* species |  |  | *Neisseria* species |
| 42 | 72/F | 2.5×105 | *Haemophilus influenzae*94/94, 100% |  | (-) | *Haemophilus influenzae* |  | GPC,GPR, GNC,GNR | *Streptococcus pneumoniae,* |
| *Streptococcus* species, |
| *Corynebacterium* species, |
|  |  |  |  |  |  |  |  | *Haemophilus influenzae,* |
|  |  |  |  |  |  |  |  |  | *Moraxella catarrhalis* |
| 43 | 79/F | 9.9×104 | *Staphylococcus aureus*74/79, 93.7% |  | GPC | *Staphylococcus aureus*(MRSA), |  | N.A. |  |
|  |  |  |  |  | *Corynebacterium* species |  |  |  |
| 44 | 58/M | 9.2×107 | *Streptococcus pneumonia*91/91, 100% |  | (-) | *Streptococcus pneumoniae* |  | GPC,GPR, GNR | *Streptococcus pneumoniae,* |
| *Staphylococcus aureus,* |
|  |  |  |  |  |  |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  |  |  |  | *Haemophilus influenzae* |
| 45 | 80/M | 1.4×108 | *Streptococcus salivarius*33/77, 42.9% |  | GPC | *Staphylococcus aureus*(MSSA) |  | (-) | *Staphylococcus aureus*(MSSA) |
| 46 | 90/M | ≤104 | (-) |  | GPC, GPR | *Staphylococcus* species, |  | GPC,GPR, GNR | *Staphylococcus* species, |
| *Streptococcus* species | *Streptococcus* species, |
|  |  |  |  |  |  |  |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  |  |  |  | *Haemophilus* species, |
|  |  |  |  |  |  |  |  |  | *Enterobacter* species |
| 47 | 61/M | 3.7×106 | *Pseudomonas aeruginosa*72/75, 96.0% |  | GPC,GPR,GNR | *Streptococcus* species, |  | GPC,GPR,GNR | *Pseudomonas aeruginosa* |
| *Corynebacterium* species, |
|  |  |  |  |  | *Pseudomonas aeruginosa* |  |  |  |
| 48 | 74/M | 3.7×105 | *Haemophilus influenzae* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 70/85, 82.4% |  |  |  |  |  |  |
| 49 | 82/M | 8.7×106 | *Streptococcus salivarius*49/77, 63.6% |  | GPC,GNR | *Staphylococcus* species, |  | GPC,GPR,GNR | *Staphylococcus* species, |
| *Streptococcus* species, | *Streptococcus* species, |
|  |  |  |  |  | *Corynebacterium* species, |  |  | *Corynebacterium* species, |
|  |  |  |  |  |  | *Enterobacter* species, |  |  | *Neisseria* species |
|  |  |  |  |  |  | *Parvimonas micra* |  |  |  |
| 50 | 81/F | 6.9×105 | *Streptococcus intermedius* |  | GPC | *Streptococcus intermedius* |  | N.A. |  |
|  |  |  | 56/60, 93.3% |  |  |  |  |  |  |
| 51 | 72/M | 4.3×107 | *Fusobacterium nucleatum*57/79, 72.2% |  | GPC | *Staphylococcus aureus* (MSSA) |  | GPC, GPR | *Staphylococcus aureus* (MSSA) |
| 52 | 70/M | 4.3×105 | *Streptococcus oralis*16/43, 37.2% |  | (-) | *Staphylococcus aureus* (MRSA) |  | N.A. |  |
| 53 | 66/M | 8.9×108 | *Parvimonas* species22/74, 29.7% |  | GPC,GPR, GNC,GNR | Oral bacteria |  | (-) | No growth |
| 54 | 86/F | 1.9×105 | *Fusobacterium nucleatum* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 21/55, 38.2% |  |  |  |  |  |  |
| 55 | 58/M | 3.1×105 | *Moraxella catarrhalis* |  | (-) | No growth |  | N.A. |  |
|  |  |  | 45/48, 93.8% |  |  |  |  |  |  |
| 56 | 68/M | 1.9×105 | *Fusobacterium nucleatum*61/80, 76.3 |  | (-) | *Veillonella* species |  | GPC,GPR, GNC,GNR | *Streptococcus constellatus* |
| 57 | 64/M | 5.8×106 | *Fusobacterium nucleatum*35/71, 49.3% |  | GPC,GPR,GNR | *Staphylococcus aureus,* |  | GPC,GPR, GNR | *Staphylococcus aureus,* |
| *Streptococcus anginosus,* | *Streptococcus anginosus,* |
|  |  |  |  |  | *Parvimonas micra* |  |  |  |
| 58 | 74/M | 6.1×106 | *Streptococcus intermedius*82/82, 100% |  | (-) | No growth |  | (-) | *Staphylococcus aureus* (MSSA) |
| 59 | 66/M | 4.7×107 | *Enterobacter aerogenes*37/72, 51.4% |  | GPC, GNR | *Staphylococcus aureus* (MRSA), |  | GPC, GNR | *Staphylococcus aureus* (MRSA) |
|  |  |  |  |  | *Klebsiella pneumoniae* |  |  |  |

*Abbreviations*: BALF, bronchoalveolar lavage fluid; GPC, Gram-positive cocci; GPR, Gram-positive rods; GNC, Gram-negative cocci; GNR, Gram-negative rods; N.A., not analyzed.