**Supplementary Table 2. Summary of the network topology of bacterial taxa interactions, derived from network analysis. The top five of the top 5% of the bacterial taxa are shown here**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Abundance** | **Degree (interaction)** | **Betweenness (influence)** | **Closeness**  **(broadcast or metabolic crosstalk)** |
| Presence of sepsis | 1. Lachnospiraceae - Blautia 2. Veillonellaceae - Veillonella dispar 3. Enterococcaceae - Enterococcus 4. Enterobacteriaceae - Klebsiella 5. Bacteroidaceae - Bacteroides | 1. Gemellaceae - Gemella 2. Micrococcaceae – Rothia mucilaginosa 3. Actinomycetaceae – Actinomyces 4. Leuconostocaceae - Leuconostoc 5. Eubacteriaceae – Pseudoramibacter Eubacterium | 1. Leptotrichiaceae - Leptotrichia- - OTU\_4345640 2. Lachnospiraceae - Ruminococcuscross5 3. Lachnospiraceae – Roseburia 4. Lachnospiraceae - OTU\_3082155 5. Neisseriaceae – Neisseria subflava | 1. Lactobacillaceae – Lactobacillus ruminis 2. Bacteroidaceae – Bacteroides ovatus 3. Veillonellaceae - Megamonas 4. Erysipelotrichaceae - Clostridiumcross7 5. Veillonellaceae – Veillonella |
| Absence of sepsis | 1. Bifidobacteriaceae- Bifidobacterium longum 2. Enterobacteriaceae--OTU\_819999 3. Bacteroidaceae - Bacteroides 4. Coriobacteriaceae – Collinsella aerofaciens 5. Enterococcaceae - Enterococcus | 1. Actinomycetaceae - Actinomyces 2. Carnobacteriaceae - Granulicatella 3. Streptococcaceae - Streptococcus 4. Micrococcaceae - Rothia 5. Lachnospiraceae - Moryella | 1. Lachnospiraceae - Moryella 2. Erysipelotrichaceae – EubacteriuM biforme 3. Erysipelotrichaceae - Catenibacterium 4. Prevotellaceae – Prevotella copri 5. Lactobacillales - OTU\_511795 | 1. Bifidobacteriaceae--Bifidobacterium 2. Lactobacillacea- Lactobacillus ruminis 3. Bacteroidaceae - Bacteroides 4. Leuconostocaceae - Leuconostoc 5. Clostridiaceae – Clostridium perfringens OTU\_353320 |
| One episode of infection/sepsis | 1. Enterobacteriaceae - OTU\_819999 2. Veillonellaceae - Veillonella 3. Bacteroidaceae - Bacteroides 4. Enterococcaceae - Enterococcus 5. Lactobacillaceae - Lactobacillus | 1. Verrucomicrobiaceae – Akkermansia muciniphila 2. TM7-3 - OTU\_4331439 3. Streptococcaceae - Lactococcus 4. Campylobacteraceae - Campylobacter 5. Porphyromonadaceae - Porphyromonas | 1. Ruminococcaceae - Ruminococcus 2. Streptococcaceae - Lactococcus 3. Lactobacillaceae - Pediococcus acidilactici 4. Ruminococcaceae - Oscillospira 5. Bacteroidaceae - Bacteroides | 1. Veillonellaceae – Megamonas 2. Bacteroidaceae – Bacteroides caccae 3. Porphyromonadaceae – Porphyromonas 4. Lactobacillaceae - Lactobacillus 5. Peptostreptococcaceae – Peptostreptococcus |
| Two or more episodes of infection/sepsis | 1. Enterococcaceae - Enterococcus 2. Enterobacteriaceae - Klebsiella 3. Bacteroidaceae - Bacteroides fragilis 4. Coriobacteriaceae - Collinsella aerofaciens 5. Bifidobacteriaceae – Bifidobacterium longum | 1. Fusobacteriaceae - Fusobacterium 2. Desulfovibrionaceae - Desulfovibrio 3. Ruminococcaceae - Faecalibacterium 4. Leuconostocaceae - Leuconostoc 5. Streptococcaceae - Lactococcus garvieae | 1. Lachnospiraceae – OTU\_1830364 2. Ruminococcaceae - Ruminococcus 3. Lachnospiraceae - Dorea 4. Enterococcaceae - Enterococcus 5. Streptococcaceae - Streptococcus | 1. Bifidobacteriaceae – Bifidobacterium longum 2. Clostridiaceae - Clostridium 3. Enterobacteriaceae - Klebsiella 4. Enterobacteriaceae - Morganella 5. Tissierellaceae - Parvimonas |
| Site of infection Lung | 1. Enterobacteriaceae - Klebsiella pneumoniae 2. Coriobacteriaceae - Collinsella aerofaciens 3. Bacteroidaceae - Bacteroides 4. Ruminococcaceae - Faecalibacterium prausnitzii 5. Veillonellaceae - Veillonella dispar | 1. Streptococcaceae - Streptococcus 2. Actinomycetaceae - Actinomyces 3. Bifidobacteriaceae - Bifidobacterium longum 4. Streptococcaceae - Streptococcus 5. TM7-3 - OTU\_4331439 | 1. Bifidobacteriaceae – Bifidobacterium longum 2. Ruminococcaceae - Oscillospira 3. Lachnospiraceae - Blautia 4. Bacteroidaceae - Bacteroides fragilis 5. Coriobacteriaceae - OTU\_227758 | 1. Enterococcaceae - Enterococcus 2. Lactobacillaceae - Lactobacillus 3. Ruminococcaceae - Faecalibacterium prausnitzii 4. Clostridiaceae - Clostridium 5. Enterobacteriaceae – Klebsiella |
| Site of infection SBP | 1. Bifidobacteriaceae - Bifidobacterium 2. Bacteroidaceae - Bacteroides 3. Lactobacillaceae - Lactobacillus 4. Veillonellaceae - Megasphaera 5. Ruminococcaceae - Faecalibacterium prausnitzii | 1. Leptotrichiaceae - Leptotrichia 2. Actinomycetaceae - Actinomyces 3. Leuconostocaceae - Leuconostoc 4. Porphyromonadaceae - Porphyromonas 5. Micrococcaceae - Rothia mucilaginosa | 1. Streptococcaceae - Streptococcus 2. Leuconostocaceae – Leuconostoc 3. Streptococcaceae – Streptococcus anginosus 4. Veillonellaceae - Dialister 5. Enterobacteriaceae - Klebsiella | 1. Lactobacillaceae – Lactobacillus 2. Bacteroidaceae - Bacteroides fragilis 3. Pseudomonadaceae - Pseudomonas 4. Propionibacteriaceae - Propionibacterium 5. Porphyromonadaceae - Porphyromonas |
| IL6 level <100 ng/dL | 1. Streptococcaceae – Streptococcus sobrinus 2. Leuconostocaceae - Leuconostoc 3. Erysipelotrichaceae - Eubacterium 4. Micrococcaceae - Rothia mucilaginosa 5. Streptococcaceae - Streptococcus anginosus | 1. Actinomycetaceae - Actinomyces 2. Veillonellaceae - Selenomonas noxia 3. Dethiosulfovibrionaceae - TG5 4. Micrococcaceae - Rothia aeria 5. Erysipelotrichaceae - Bulleidia | 1. Micrococcaceae - Rothia 2. Erysipelotrichaceae - Eubacterium 3. Veillonellaceae - Selenomonas 4. Neisseriaceae - OTU\_927328 5. Dethiosulfovibrionaceae - TG5 | 1. Lactobacillaceae – Lactobacillus zeae 2. Rikenellaceae – Rikenella 3. Christensenellaceae - 4. Enterobacteriaceae – Morganella 5. Enterobacteriaceae - Enterobacter |
| IL6 level 100–1000 ng/dL | 1. Enterobacteriaceae - Klebsiella 2. Bifidobacteriaceae - Bifidobacterium longum 3. Lactobacillaceae - Lactobacillus ruminis 4. Ruminococcaceae - Faecalibacterium prausnitzii 5. Coriobacteriaceae - Collinsella aerofaciens | 1. Streptococcaceae - Streptococcus anginosus 2. Gemellaceae - Gemella 3. Pseudomonadaceae - Pseudomonas 4. Micrococcaceae - Rothia dentocariosa 5. Coriobacteriaceae - Atopobium | 1. Enterobacteriaceae - Citrobacter 2. Bacteroidaceae - Bacteroides 3. Streptococcaceae - Streptococcus 4. Enterobacteriaceae—Klebsiella 5. Bifidobacteriaceae - Bifidobacterium longum | 1. Lactobacillaceae Lactobacillus ruminis 2. Clostridiaceae - Clostridium 3. Bacteroidaceae – Bacteroides ovatus 4. Leuconostocaceae - Leuconostoc 5. Bifidobacteriaceae - Bifidobacterium |
| IL6 level >1000 ng/dL | 1. Enterobacteriaceae - Klebsiella 2. Enterococcaceae - Enterococcus 3. Bacteroidaceae - Bacteroides 4. Bifidobacteriaceae - Bifidobacterium 5. Ruminococcaceae - Faecalibacterium prausnitzii | 1. Bifidobacteriaceae - Bifidobacterium 2. Ruminococcaceae - Oscillospira 3. Bacteroidaceae - Bacteroides 4. Lactobacillaceae - Lactobacillus 5. Bacteroidaceae - Bacteroides fragilis | 1. Coriobacteriaceae – Coriobacterium OTU\_227758 2. Bacteroidaceae - Bacteroides OTU\_193591 3. Veillonellaceae - Dialister 4. Bifidobacteriaceae - Bifidobacterium 5. Bacteroidaceae – Bacteroides fragilis | 1. Bacteroidaceae - Bacteroides 2. Enterococcaceae - Enterococcus 3. Enterobacteriaceae – Klebsiella 4. Prevotellaceae – Prevotella copri 5. Bifidobacteriaceae – Bifidobacterium longum |
| Death during same admission | 1. Enterobacteriaceae - Klebsiella 2. Bifidobacteriaceae - Bifidobacterium 3. Enterococcaceae - Enterococcus 4. Ruminococcaceae - Faecalibacterium prausnitzii 5. Veillonellaceae - Veillonella dispar | 1. Coriobacteriaceae - Atopobium 2. Erysipelotrichaceae - Eubacterium dolichum 3. Ruminococcaceae - Oscillospira 4. Micrococcaceae - Rothia mucilaginosa 5. Enterococcaceae - Vagococcus | 1. Coriobacteriaceae - Atopobium 2. Lactobacillaceae – Lactobacillus zeae 3. Lachnospiraceae - Blautia 4. Ruminococcaceae - Oscillospira 5. Enterococcaceae - Vagococcus | 1. Veillonellaceae - Veillonella 2. Clostridiaceae - Clostridium 3. Enterobacteriaceae - Morganella 4. Enterococcaceae – Enterococcus 5. Chloroplast - Streptophyta |
| Survived during same admission | 1. Bifidobacteriaceae - Bifidobacterium 2. Enterobacteriaceae - Citrobacter 3. Bacteroidaceae - Bacteroides 4. Coriobacteriaceae - Collinsella aerofaciens 5. Enterococcaceae - Enterococcus | 1. TM& - TM7-3 2. Actinomycetaceae - Actinomyces 3. Neisseriaceae - Neisseria subflava 4. Micrococcaceae - Rothia dentocariosa 5. Bifidobacteriaceae - Scardovia | 1. Veillonellaceae- Selenomonas 2. Neisseriaceae – Neisseria 3. Streptococcaceae - Streptococcus 4. Micrococcaceae – Rothia 5. Lachnospiraceae - Oribacterium | 1. Erysipelotrichaceae - Catenibacterium 2. Paraprevotellaceae - Paraprevotella 3. Erysipelotrichaceae - Catenibacterium 4. Lachnospiraceae - Roseburia faecis 5. Clostridiaceae – Clostridium perfringens |
| Overall survived | 1. Bifidobacteriaceae – Bifidobacterium longum 2. Lactobacillaceae - Lactobacillus 3. Streptococcaceae - Streptococcus 4. Enterobacteriaceae - Klebsiella 5. Bacteroidaceae - Bacteroides | 1. Coriobacteriaceae - Atopobium 2. Micrococcaceae - Rothia mucilaginosa 3. Veillonellaceae - Schwartzia 4. Bifidobacteriaceae - Scardovia 5. Erysipelotrichaceae - Eubacterium biforme | 1. TM7-3 - OTU\_4331439 2. Neisseriaceae – Neisseria 3. Veillonellaceae - Selenomonas 4. Tissierellaceae – Parvimonas 5. Coriobacteriaceae - Atopobium | 1. Fusobacteriaceae - Fusobacterium 2. Bacteroidaceae - Bacteroides 3. Veillonellaceae - Acidaminococcus 4. Bifidobacteriaceae – Bifidobacterium longum 5. Erysipelotrichaceae – Eubacterium biforme |
| Overall died | 1. Bifidobacteriaceae - Bifidobacterium 2. Enterobacteriaceae - Klebsiella 3. Bacteroidaceae - Bacteroides 4. Enterococcaceae - Enterococcus 5. Lactobacillaceae - Lactobacillus | 1. Actinomycetaceae - Actinomyces 2. Porphyromonadaceae - Porphyromonas 3. Gemellaceae - Gemella 4. Micrococcaceae - Rothia dentocariosa 5. Micrococcaceae - Rothia mucilaginosa- | 1. Neisseriaceae – Neisseria subflava 2. Ruminococcaceae - Oscillospira 3. Erysipelotrichaceae - Eubacterium biforme 4. Pasteurellaceae – Pasturella 5. Lachnospiraceae - Lachnospira | 1. Bifidobacteriaceae - Bifidobacterium 2. Lactobacillaceae - Lactobacillus 3. Pseudomonadaceae - Pseudomonas 4. Bacteroidaceae – Bacteroides fragilis 5. Staphylococcaceae - Staphylococcus |