**TABLE S1**

1. **Preparation of Synthetic CF Sputum Media (SCFM) for use with *ex vivo* pig lung model**

Modified from the recipe developed by Palmer *et al*.24 Once made, the SCFM should be filter sterilized, and may then be stored at 4°C for up to one month.

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| **a) Main recipe** |
| **Step 1** | **Chemical** | **Amount** | **Instructions** | **Final mM in 1L SCFM** |
| NaCl | 3.03 g | Add salts and water to clean bottle, used only for preparation of SCFM | 51.85 |
| KCl | 1.114 g | 14.94 |
| dH2O | 640 ml | N/A |
|  |   |   |   |   |
| **Step 2** | **Chemical** | **Molarity of stock made in water, filter-sterilized and stored at 4°C** | **Instructions** | **Final mM in 1L SCFM** |
| Na2HPO4 | 0.125 M | Add 10 ml of each stock to the salts and water prepared in step 1 | 1.25 |
| NaH2PO4 | 0.13 M | 1.30 |
| NH4Cl | 0.228 M | 2.28 |
| KNO3 | 0.0348 M | 0.35 |
| K2SO4 | 0.0271 M | 0.27 |
| MOPS | 1 M | 10.00 |
|  |   |   |   |   |
| **Step 3** | **Chemical** |   | **Instructions** | **Final mM in 1L SCFM** |
| 19 amino acids solutions prepared according to section b) | Add 10 ml of each stock to the solution prepared in steps 1 and 2. | See section b) |
|  |   |   |   |   |
| **Step 4** | **Chemical** | **Instructions** | **Final mM in 1L SCFM** |
| HCl or NaOH as required | Use to adjust pH of solution prepared in steps 1-3 to 6.8. Record volume of acid/base added. | N/A |
|  |   |   |   |   |
| **Step 5** | **Chemical** | **Instructions** | **Final mM in 1L SCFM** |
| dH2O | Add to solution prepared in steps 1-4, to a final volume of 960 ml | N/A |
|  |   |   |   |   |
| **Step 6** | **Chemical** | **Molarity of stock made in water, filter-sterilized and stored at 4°C** | **Instructions** | **Final mM in 1L SCFM** |
| CaCl2 | 0.175 M | Add 10 ml of each stock to the solution prepared in steps 1-5 | 1.75 |
| MgCl2 | 0.0606 M | 0.61 |
|  |   |   |   |   |
| **Step 7** | **Chemical** | **Molarity of stock made in water, filter-sterilized and stored at 4°C** | **Instructions** | **Final mM in 1L SCFM** |
| L-Lactic acid | 0.93 M | Make stock in water, pH to 7 with 5M NaOH. Add 10 ml to the solution prepared in steps 1-6. | 9.30 |
|  |   |   |   |   |
| **Step 8** | **Chemical** | **Molarity of working stock made in water, immediately before adding to the recipe** | **Instructions** | **Final mM in 1L SCFM** |
| Fe(III)SO4.7H2O | 0.00036 M | Make a 0.036 M master stock, which can be filter sterilized and stored at 4°C for as long as the solution remains free of precipitate. To make the working stock, add 110 µl of the master stock to 9.890 ml dH2O and add the working stock to the solution prepared in steps 1-7.  | 0.0036 |

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| **b) Preparation of amino acid stocks; filter sterilize before use and store at 4°C.** |
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| **Amino Acid** | **mM stock** | **Instructions** | **Final mM in 1 L SCFM** |
| Alanine | 178 | Dissolve in water | 1.780 |
| Arginine | 30.6 | Dissolve in water | 0.306 |
| Aspartate | 82.7 | Dissolve in 0.5 M NaOH | 0.827 |
| Cysteine | 16 | Dissolve in water | 0.160 |
| Glutamic Acid | 154.9 | Dissolve in 1 M HCl | 1.549 |
| Glycine | 120.3 | Dissolve in water | 1.203 |
| Histidine | 51.9 | Dissolve in water | 0.519 |
| Isoleucine | 112.1 | Dissolve in water by heating to 50°C for 30 mins on a shaker | 1.121 |
| Leucine | 160.9 | Dissolve in water | 1.609 |
| Lysine | 212.8 | Dissolve in water | 2.128 |
| Methionine | 63.3 | Dissolve in water | 0.633 |
| Ornithine-HCl | 67.6 | Dissolve in water | 0.676 |
| Phenylalanine | 53 | Dissolve in water | 0.530 |
| Proline | 166 | Dissolve in water | 1.660 |
| Serine | 144.6 | Dissolve in water | 1.446 |
| Threonine | 107.2 | Dissolve in water | 1.072 |
| Tryptophan | 1.3 | Dissolve in 0.2 M NaOH | 0.013 |
| Tyrosine | 80.2 | Dissolve in 1M NaOH | 0.802 |
| Valine | 111.7 | Dissolve in water | 1.117 |