### Table S1. Sequences of primers used in this study

| Gene name | Primer name | Primer sequence                        | Function                               | PCR condition          |
|-----------|-------------|----------------------------------------|----------------------------------------|------------------------|
| benA      | 370.1       | AATTGGTGCCGCTTCTGG                     | benA forward primer                    | 95°C 7min              |
|           | 370.2       | AGTTGTCCGGACGGAATAG                    | benA reverse primer                    | 35 cycles 95°C 30s     |
|           |             |                                        |                                        | 30 cycles 61°C 30s     |
|           |             |                                        |                                        | 72°C 1 min             |
|           |             |                                        |                                        | 72°C 10min             |
| cyp51A    | 2.47        | TCAATGTGCTCAGCGG                      | cyp51A forward primer; cyp51A Sequencing primer | 98°C 30s              |
|           | 5.2         | TCGAGGGGTTGAATTATATAAATACAC            | cyp51A reverse primer; cyp51A Sequencing primer | 98°C 10s              |
|           | 2.48        | ATGGTGCCGATGCTATGG                    | cyp51A Sequencing primer               | 40 cycles 58°C 30s     |
|           | 2.49        | CTGTCTACCTGGATGTG                     | cyp51A Sequencing primer               | 40 cycles 72°C 4min    |
|           | 2.50        | TAGTCCATTCAGACCCCC                    | cyp51A Sequencing primer               | 72°C 10min             |
|           | 2.52        | TTGGTGACCCGGTTTTGTATGTGCAG            | cyp51A Sequencing primer               |                       |
|           | 2.58        | TCTCTGACGCAAAGAACAGAC                 | cyp51A Sequencing primer               |                       |
|           | 5.24        | GTGCTCATTTGCTCACCTG                   | cyp51A Sequencing primer               |                       |
| Strain No. | Species name       | Accession No. | Source       | Origin         |
|-----------|--------------------|---------------|--------------|----------------|
| 246-60    | Aspergillus fumigatus | MK190287      | sputum       | Shanghai China |
| 246-62    | Aspergillus fumigatus | MK190288      | sputum       | Shanghai China |
| 246-63    | Aspergillus fumigatus | MK190289      | sputum       | Shanghai China |
| 246-64    | Aspergillus fumigatus | MK190290      | Catheter     | Shanghai China |
| 246-65    | Aspergillus fumigatus | MK190291      | sputum       | Shanghai China |
| 246-66    | Aspergillus fumigatus | MK190292      | sputum       | Shanghai China |
| 246-67    | Aspergillus fumigatus | MK190293      | sputum       | Shanghai China |
| 246-68    | Aspergillus fumigatus | MK190294      | sputum       | Shanghai China |
| 246-69    | Aspergillus fumigatus | MK190295      | substitution fluid | Shanghai China |
| 246-70    | Aspergillus fumigatus | MK190296      | pleural fluid | Shanghai China |
| 246-71    | Aspergillus fumigatus | MK190297      | puncture fluid | Shanghai China |
| 246-72    | Aspergillus fumigatus | MK190298      | sputum       | Shanghai China |
| 246-73    | Aspergillus fumigatus | MK190299      | BALF         | Shanghai China |
| 246-74    | Aspergillus fumigatus | MK190300      | BALF         | Shanghai China |
| 246-76    | Aspergillus fumigatus | MK190301      | BALF         | Shanghai China |
| 246-77    | Aspergillus fumigatus | MK190302      | BALF         | Shanghai China |
| 246-78    | Aspergillus fumigatus | MK190303      | sputum       | Shanghai China |
| 246-81    | Aspergillus fumigatus | MK190304      | BALF         | Shanghai China |
| 247-01    | Aspergillus fumigatus | MK190305      | BALF         | Shanghai China |
| 247-02    | Aspergillus fumigatus | MK190306      | substitution fluid | Shanghai China |
| 247-04    | Aspergillus fumigatus | MK190307      | sputum       | Shanghai China |
| 247-05    | Aspergillus fumigatus | MK190308      | BALF         | Shanghai China |
| 247-06    | Aspergillus fumigatus | MK190309      | sputum       | Shanghai China |
| 247-07    | Aspergillus fumigatus | MK190310      | sputum       | Shanghai China |
| 247-11    | Aspergillus fumigatus | MK190311      | BALF         | Shanghai China |
| 247-13    | Aspergillus fumigatus | MK190312      | sputum       | Shanghai China |
| 247-14    | Aspergillus fumigatus | MK190313      | sputum       | Shanghai China |
| 247-15    | Aspergillus fumigatus | MK190314      | sputum       | Shanghai China |
| 247-17    | Aspergillus fumigatus | MK190315      | sputum       | Shanghai China |
| 247-19    | Aspergillus fumigatus | MK190316      | articular cavity fluid | Shanghai China |
| 247-20    | Aspergillus fumigatus | MK190317      | sputum       | Shanghai China |
| 247-21    | Aspergillus fumigatus | MK190318      | sputum       | Shanghai China |
| 247-22    | Aspergillus fumigatus | MK190319      | faeces       | Shanghai China |
| 247-25    | Aspergillus fumigatus | MK190320      | sputum       | Shanghai China |
| 247-26    | Aspergillus fumigatus | MK190321      | sputum       | Shanghai China |
| 247-27    | Aspergillus fumigatus | MK190322      | sputum       | Shanghai China |
| 247-29    | Aspergillus fumigatus | MK190323      | sputum       | Shanghai China |
| 247-31    | Aspergillus fumigatus | MK190324      | sputum       | Shanghai China |
| 247-32    | Aspergillus fumigatus | MK190325      | sputum       | Shanghai China |
| Strain No. | Species name           | Accession No. | Source | Origin  |
|-----------|------------------------|---------------|--------|---------|
| 247-33    | Aspergillus fumigatus   | MK190326      | sputum | Shanghai China |
| 247-34    | Aspergillus fumigatus   | MK190327      | sputum | Shanghai China |
| 247-35    | Aspergillus fumigatus   | MK190328      | sputum | Shanghai China |
| 247-36    | Aspergillus fumigatus   | MK190329      | sputum | Shanghai China |
| 247-37    | Aspergillus fumigatus   | MK190330      | sputum | Shanghai China |
| 247-38    | Aspergillus fumigatus   | MK190331      | sputum | Shanghai China |
| 247-39    | Aspergillus fumigatus   | MK190332      | sputum | Shanghai China |
| 247-40    | Aspergillus fumigatus   | MK190333      | sputum | Shanghai China |
| 247-41    | Aspergillus fumigatus   | MK190334      | sputum | Shanghai China |
| 247-42    | Aspergillus fumigatus   | MK190335      | sputum | Shanghai China |
| 247-44    | Aspergillus fumigatus   | MK190336      | sputum | Shanghai China |
| 247-45    | Aspergillus fumigatus   | MK190337      | sputum | Shanghai China |
| 247-46    | Aspergillus fumigatus   | MK190338      | urine  | Shanghai China |
| 247-47    | Aspergillus fumigatus   | MK190339      | sputum | Shanghai China |
| 247-48    | Aspergillus fumigatus   | MK190340      | sputum | Shanghai China |
| 247-49    | Aspergillus fumigatus   | MK190341      | sputum | Shanghai China |
| 247-50    | Aspergillus fumigatus   | MK190342      | sputum | Shanghai China |
| 247-51    | Aspergillus fumigatus   | MK190343      | sputum | Shanghai China |
| 247-52    | Aspergillus fumigatus   | MK190344      | sputum | Shanghai China |
| 247-53    | Aspergillus fumigatus   | MK190345      | sputum | Shanghai China |
| 247-54    | Aspergillus fumigatus   | MK190346      | sputum | Shanghai China |
| 247-55    | Aspergillus fumigatus   | MK190347      | sputum | Shanghai China |
| 247-56    | Aspergillus fumigatus   | MK190348      | sputum | Shanghai China |
| 247-57    | Aspergillus fumigatus   | MK190349      | sputum | Shanghai China |
| 247-61    | Aspergillus fumigatus   | MK190350      | BALF   | Shanghai China |
| 247-62    | Aspergillus fumigatus   | MK190351      | sputum | Shanghai China |
| 247-63    | Aspergillus fumigatus   | MK190352      | sputum | Shanghai China |
| 247-64    | Aspergillus fumigatus   | MK190353      | sputum | Shanghai China |
| 247-65    | Aspergillus fumigatus   | MK190354      | sputum | Shanghai China |
| 247-66    | Aspergillus fumigatus   | MK190355      | sputum | Shanghai China |
| 247-67    | Aspergillus fumigatus   | MK190356      | sputum | Shanghai China |
| 247-68    | Aspergillus fumigatus   | MK190357      | CSF    | Shanghai China |
| 247-69    | Aspergillus fumigatus   | MK190358      | sputum | Shanghai China |
| 247-70    | Aspergillus fumigatus   | MK190359      | sputum | Shanghai China |
| 247-71    | Aspergillus fumigatus   | MK190360      | sputum | Shanghai China |
| 247-72    | Aspergillus fumigatus   | MK190361      | sputum | Shanghai China |
| 247-73    | Aspergillus fumigatus   | MK190362      | sputum | Shanghai China |
| 247-75    | Aspergillus fumigatus   | MK190363      | sputum | Shanghai China |
| 247-76    | Aspergillus fumigatus   | MK190364      | urine  | Shanghai China |
| 247-77    | Aspergillus fumigatus   | MK190365      | sputum | Shanghai China |
| 247-78    | Aspergillus fumigatus   | MK190366      | sputum | Shanghai China |
| 247-79    | Aspergillus fumigatus   | MK190367      | sputum | Shanghai China |
| Strain No. | Species name          | Accession No. | Source | Origin       |
|------------|-----------------------|---------------|--------|--------------|
| 247-80     | *Aspergillus fumigatus* | MK190368      | sputum | Shanghai China |
| 248-01     | *Aspergillus fumigatus* | MK190369      | sputum | Shanghai China |
| 248-02     | *Aspergillus fumigatus* | MK190370      | sputum | Shanghai China |
| 248-03     | *Aspergillus fumigatus* | MK190371      | sputum | Shanghai China |
| 248-04     | *Aspergillus fumigatus* | MK190372      | sputum | Shanghai China |
| 248-05     | *Aspergillus fumigatus* | MK190373      | sputum | Shanghai China |
| 248-06     | *Aspergillus fumigatus* | MK190374      | CSF    | Shanghai China |
| 248-07     | *Aspergillus fumigatus* | MK190375      | sputum | Shanghai China |
| 248-08     | *Aspergillus fumigatus* | MK190376      | sputum | Shanghai China |
| 248-09     | *Aspergillus fumigatus* | MK190377      | sputum | Shanghai China |
| 248-10     | *Aspergillus fumigatus* | MK190378      | sputum | Shanghai China |
| 248-11     | *Aspergillus fumigatus* | MK190379      | sputum | Shanghai China |
| 248-13     | *Aspergillus fumigatus* | MK190380      | Catheter | Shanghai China |
| 248-14     | *Aspergillus fumigatus* | MK190381      | pleural fluid | Shanghai China |
| 248-16     | *Aspergillus fumigatus* | MK190382      | BALF  | Shanghai China |
| 248-18     | *Aspergillus fumigatus* | MK190383      | sputum | Shanghai China |
| 248-19     | *Aspergillus fumigatus* | MK190384      | sputum | Shanghai China |
| 248-20     | *Aspergillus fumigatus* | MK190385      | sputum | Shanghai China |
| 248-21     | *Aspergillus fumigatus* | MK190386      | sputum | Shanghai China |
| 248-22     | *Aspergillus fumigatus* | MK190387      | sputum | Shanghai China |
| 248-23     | *Aspergillus fumigatus* | MK190388      | BALF  | Shanghai China |
| 248-24     | *Aspergillus fumigatus* | MK190389      | sputum | Shanghai China |
| 248-25     | *Aspergillus fumigatus* | MK190390      | sputum | Shanghai China |
| 248-26     | *Aspergillus fumigatus* | MK190391      | sputum | Shanghai China |
| 248-28     | *Aspergillus fumigatus* | MK190392      | sputum | Shanghai China |
| 248-29     | *Aspergillus fumigatus* | MK190393      | sputum | Shanghai China |
| 248-30     | *Aspergillus fumigatus* | MK190394      | BALF  | Shanghai China |
| 248-32     | *Aspergillus fumigatus* | MK190395      | sputum | Shanghai China |
| 248-33     | *Aspergillus fumigatus* | MK190396      | sputum | Shanghai China |
| 248-34     | *Aspergillus fumigatus* | MK190397      | sputum | Shanghai China |

**BAL:** bronchial alveolar lavage fluid  
**CSF:** cerebrospinal fluid