

**Table S1: Identification of NHEJ-like genes in 38 complete genomes of *Streptomyces* by their locus\_tag**

| Organism <sup>a</sup>        | Strain            | Ku-like                                    |                         |                            | ATP-dependant DNA ligase |                            | Poldom-like          |                      |                      |
|------------------------------|-------------------|--------------------------------------------|-------------------------|----------------------------|--------------------------|----------------------------|----------------------|----------------------|----------------------|
|                              |                   | KuA                                        | KuB                     | KuC                        | LigC                     | LigD                       | PolK                 | PolO                 | PolR                 |
| <i>S. xiamenensis</i>        | 318               | SXIM_04360                                 | -                       | -                          | SXIM_50860               | SXIM_51150                 | SXIM_04370           | -                    | SXIM_50850           |
| <i>S. albus</i>              | J1074             | XNR_1492                                   | -                       | -                          | XNR_0334                 | -                          | XNR_1493             | XNR_4488             | XNR_0333             |
| <i>S. sp. Tu6071</i>         | Tu6071            | STTU_1942                                  | STTU_p0165 (plasmidic)  | -                          | STTU_0771                | -                          | STTU_1943            | -                    | STTU_0755            |
| <i>S. sp. SirexAA-E</i>      | SirexAA-E         | SACTE_4537                                 | SACTE_2358              | -                          | SACTE_5876               | SACTE_2357 **              | SACTE_4536           | -                    | SACTE_5877           |
| <i>S. glaucescens</i>        | GLA.O             | SGLAU_22870                                | SGLAU_03430             | -                          | SGLAU_28040              | SGLAU_02470                | SGLAU_22865          | SGLAU_27360          | SGLAU_28045          |
| <i>S. sp. PAMC26508</i>      | PAMC26508         | F750_4842                                  | F750_2703               | -                          | F750_6167                | F750_2702 **               | F750_4841            | -                    | F750_6168            |
| <i>S. pratensis</i>          | ATCC 33331        | Sfla_1981                                  | Sfla_4020               | -                          | Sfla_0697                | Sfla_4021 **               | Sfla_1982            | -                    | Sfla_0696            |
| <i>S. cyaneogriseus</i>      | NMWT 1            | TU94_22180                                 | TU94_01235              | -                          | TU94_28785               | TU94_01705                 | TU94_22175           | -                    | TU94_28790           |
| <i>S. globisporus</i>        | C-1027            | WQO_24480                                  | WQO_00275               | -                          | WQO_30485                | WQO_00280 **               | WQO_24475            | -                    | WQO_30490            |
| <i>S. fulvissimus</i>        | DSM 40593         | SFUL_5135                                  | -                       | -                          | SFUL_6473                | SFUL_6958 partial          | SFUL_5134            | -                    | SFUL_6474            |
| <i>S. sp. CNQ-509</i>        | CNQ-509           | AA958_07445                                | -                       | -                          | AA958_31995              | AA958_07435                | AA958_07440          | -                    | AA958_31990          |
| <i>S. sp. 4F</i>             | 4F                | ASR50_24150                                | -                       | -                          | ASR50_30225              | ASR50_04130                | ASR50_24145          | ASR50_29170          | ASR50_30230          |
| <i>S. cattleya</i>           | NRRL 8057         | SCAT_5458                                  | -                       | -                          | SCAT_5513                | SCAT_5457                  | SCAT_5459            | -                    | SCAT_5514            |
| <i>S. leeuwenhoekii</i>      | C34               | sle_24310                                  | sle_66420               | sle1_073 (plasmidic)       | sle_11180                | sle_65450                  | sle_24320            | sle_12820            | sle_11170            |
| <i>S. sp. CFMR 7</i>         | CFMR-7            | ABE83_10835                                | ABE83_34905 (plasmidic) | -                          | ABE83_03950              | ABE83_34900 (plasmidic) ** | ABE83_10840          | -                    | ABE83_03945          |
| <i>S. lividans</i>           | TK24              | SLIV_11825                                 | SLIV_34940              | -                          | SLIV_04970               | SLIV_02570                 | SLIV_11830           | SLIV_05935           | SLIV_04965           |
| <i>S. collinus</i>           | Tu 365            | B446_24990                                 | B446_25000              | -                          | B446_30620               | B446_04080                 | B446_24985           | -                    | B446_30625           |
| <b><i>S. ambofaciens</i></b> | <b>ATCC 23877</b> | <b>SAM23877_5082</b>                       | <b>SAM23877_6929</b>    | <b>SAM23877_6942</b>       | <b>SAM23877_6361</b>     | <b>SAM23877_0862</b>       | <b>SAM23877_5081</b> | <b>SAM23877_6202</b> | <b>SAM23877_6362</b> |
| <i>S. pristinaespiralis</i>  | HCCB 10218        | SPRI_2569                                  | SPRI_6210               | -                          | SPRI_1068                | -                          | SPRI_2570            | SPRI_6912            | SPRI_1067            |
| <i>S. griseus</i>            | NBRC 13350        | SGR_2195                                   | SGR_6689                | -                          | SGR_1024                 | SGR_6690 **                | SGR_2196             | -                    | SGR_1023             |
| <i>S. coelicolor</i>         | A3(2)             | SCO5309                                    | SCO0601                 | SCP1.68 (plasmidic)        | SCO6707                  | SCO7345                    | SCO5308              | SCO6498              | SCO6709              |
| <i>S. sp. Mg1</i>            | Mg1               | M444_23390                                 | M444_38170 (plasmidic)  | -                          | M444_27900               | -                          | M444_23395           | -                    | M444_27905           |
| <i>S. venezuelae</i>         | ATCC 15439        | BN2537_5885                                | -                       | -                          | BN2537_3729              | -                          | BN2537_5887          | -                    | BN2537_3727          |
| <i>S. avermitilis</i>        | MA-4680           | SAVERM_2945                                | SAVERM_879              | -                          | SAVERM_1697              | -                          | SAVERM_2946          | -                    | SAVERM_1696          |
| <i>S. vietnamensis</i>       | GIM4.0001         | -                                          | -                       | -                          | SVTN_31170               | -                          | -                    | SVTN_30635           | SVTN_31290           |
| <i>S. lydicus</i>            | A02               | T261_0648 ;<br>T261_7118                   | -                       | -                          | T261_0463                | T261_1796                  | T261_0647            | T261_1305            | T261_0462            |
| <i>S. reticuli</i>           | -                 | TUE45_05821                                | TUE45_00512             | pSRTUE45b_0023 (plasmidic) | TUE45_07256              | TUE45_00866                | TUE45_05820          | TUE45_07099          | TUE45_07257          |
| <i>S. albulus</i>            | NK660             | DC74_7120 ;<br>DC74_1747                   | -                       | -                          | DC74_7353                | DC74_6447                  | DC74_7121            | -                    | DC74_7354            |
| <i>S. davawensis</i>         | JCM4913           | BN159_3066                                 | -                       | -                          | BN159_1716               | BN159_8336                 | BN159_3067           | -                    | BN159_1715           |
| <i>S. albulus</i>            | ZPM               | SAZ_36915 ;<br>SAZ_09280                   | -                       | -                          | SAZ_38065                | SAZ_33260                  | SAZ_36920            | -                    | SAZ_38070            |
| <i>S. hygroscopicus</i>      | TL01              | SHJGH_6179                                 | SHJGH_p1006 (plasmidic) | -                          | SHJGH_7371               | SHJGH_1851                 | SHJGH_6178           | SHJGH_7216           | SHJGH_7372           |
| <i>S. scabiei</i>            | 87.22             | SCAB_29491                                 | -                       | -                          | SCAB_13591               | -                          | SCAB_29521           | SCAB_17401           | SCAB_13581           |
| <i>S. sp. CdTB01</i>         | CdTB01            | AS200_17145                                | -                       | -                          | AS200_09240              | AS200_41235                | AS200_17150          | AS200_10695          | AS200_09235          |
| <i>S. sp. 769</i>            | 769               | GZL_01529 ;<br>GZL_07396                   | -                       | -                          | GZL_01249                | GZL_02561                  | GZL_01528            | -                    | GZL_01248            |
| <i>S. hygroscopicus</i>      | 5008              | SHJG_6418                                  | SHJG_p1006 (plasmidic)  | -                          | SHJG_7610                | SHJG_2086                  | SHJG_6417            | SHJG_7456            | SHJG_7611            |
| <i>S. hygroscopicus</i>      | KCTC 1717         | SHL15_5064                                 | SHL15_7590              | -                          | SHL15_6478               | SHL15_0572                 | SHL15_5063           | SHL15_6335           | SHL15_6479           |
| <i>S. violaceusniger</i>     | Tu 4113           | Strvi_1038 ;<br>Strvi_6521 ;<br>Strvi_4745 | -                       | -                          | Strvi_3581               | Strvi_5345                 | Strvi_1039           | Strvi_0339           | Strvi_3580           |
| <i>S. bingchenggensis</i>    | BCW-1             | SBI_06359                                  | -                       | -                          | SBI_08910                | -                          | SBI_06360            | -                    | SBI_08909            |

<sup>a</sup> the species have been ordered by their genome size, from the smaller to the larger.

\*\* *ligD* gene colocalizing with *kuC* gene