

## **Description of Additional Supplementary Files**

**Supplementary Data S1:** A list of 9,225 replicons used in searching for coARGs.

**Supplementary Data S2:** ARG families in plasmid resistance islands (REI). The table is ordered according to the frequency in REI.

**Supplementary Data S3:** The frequency of significant cooccurring ARGs (coARGs) in replicons, syntenic blocks and transposable elements.

**Supplementary Data S4:** Biased distribution of transposases and site-specific recombinases (SSRs) in plasmids and chromosomes.

Significant occurrence of SSRs in plasmids or chromosomes was tested using two-sided Fisher's exact test ( $\alpha=0.05$ ) corrected with false discovery rate (FDR). The table is ordered according to the frequency in REI.

**Supplementary Data S5:** A list of significantly co-occurring ARGs in ARG-encoding plasmids.

The table comprises three components: K: Klebsiella plasmids; E: Escherichia plasmids; S: Salmonella plasmids. Significant cooccurrence of ARG pairs from different gene families was tested using two-sided Fisher's exact test in ARG-carrying plasmids ( $\alpha=0.05$  and correction for multiple comparisons with FDR).

**Supplementary Data S6:** CSBs distribute biased towards specific PTU.  
CSBs are shown in Figure 6.

**Supplementary Data S7:** Example pieces of resistance island.

CSBs are shown in Supplementary Data S7.