

**Supplementary Table I Analysis of the meiotic cross of strains  $\Delta hapX$  and  $\Delta sreA$ .**

**A** Genotypes of progeny recovered from the meiotic cross of strains  $\Delta hapX$  (*argB2*; *pyrG89*; *wA3*; *pyroA4*; *biA*; *hapXΔ::argB*; ArgB<sup>+</sup>) and  $\Delta sreA$  (*argB2*; *bgA0*; *biA*; *sreAΔ::argB*; ArgB<sup>+</sup>), with and without supplementation of the growth medium with arginine. Progeny were not tested for their ability of lactose utilization (*bgA0*). In accordance to the genotypes of the parental strains all progeny were biotin auxotroph (*biA*), and *hapX*<sup>+</sup>/*sreA*<sup>+</sup> progeny was exclusively recovered when arginine was added to the medium.

| Genotype | Genomic markers    |                    |              |               |            | Number of progeny recovered |           |           |
|----------|--------------------|--------------------|--------------|---------------|------------|-----------------------------|-----------|-----------|
|          | <i>ΔhapX::argB</i> | <i>ΔsreA::argB</i> | <i>argB2</i> | <i>pyrG89</i> | <i>wA3</i> | <i>pyroA4</i>               | +arginine | -arginine |
| 1        | +                  |                    | +            | +             | +          | +                           | 2         | 3         |
| 2        | +                  |                    | +            | +             | +          |                             | 3         | 5         |
| 3        | +                  |                    | +            | +             |            | +                           | 2         | 3         |
| 4        | +                  |                    | +            | +             |            |                             | 1         | 1         |
| 5        | +                  |                    | +            |               | +          | +                           | 4         | 5         |
| 6        | +                  |                    | +            |               | +          |                             | 3         | 5         |
| 7        | +                  |                    | +            |               |            | +                           | 0         | 2         |
| 8        | +                  |                    | +            |               |            |                             | 2         | 3         |
| 9        |                    | +                  | +            | +             | +          | +                           | 2         | 2         |
| 10       |                    | +                  | +            | +             | +          |                             | 2         | 3         |
| 11       |                    | +                  | +            | +             |            | +                           | 3         | 4         |
| 12       |                    | +                  | +            | +             |            |                             | 5         | 5         |
| 13       |                    | +                  | +            |               | +          | +                           | 2         | 2         |
| 14       |                    | +                  | +            |               | +          |                             | 3         | 3         |
| 15       |                    | +                  | +            |               |            | +                           | 1         | 3         |
| 16       |                    | +                  | +            |               |            |                             | 2         | 1         |
| 17       |                    |                    | +            | +             | +          | +                           | 0         |           |
| 18       |                    |                    | +            | +             | +          |                             | 2         |           |
| 19       |                    |                    | +            | +             |            | +                           | 2         |           |
| 20       |                    |                    | +            | +             |            |                             | 1         |           |
| 21       |                    |                    | +            |               | +          | +                           | 2         |           |
| 22       |                    |                    | +            |               | +          |                             | 1         |           |
| 23       |                    |                    | +            |               |            | +                           | 2         |           |
| 24       |                    |                    | +            |               |            |                             | 3         |           |
| Total    |                    |                    |              |               |            |                             | 50        | 50        |

**B** Percental distribution of the genetic markers in the recovered progeny with and without arginine supplementation.

| Growth condition | Marker distribution (%) |               |            |               |
|------------------|-------------------------|---------------|------------|---------------|
|                  | <i>argB2</i>            | <i>pyrG89</i> | <i>wA3</i> | <i>pyroA4</i> |
| +arginine        | 26                      | 50            | 52         | 44            |
| -arginine        |                         | 52            | 56         | 48            |