

Before phylogenetic correction:

| Capsule group                       | Average genome size (log10) | Length of capsule systems |     |        | Correlation (rho) | P-value       | Significance |
|-------------------------------------|-----------------------------|---------------------------|-----|--------|-------------------|---------------|--------------|
|                                     |                             | Min                       | Max | Median |                   |               |              |
| Group I                             | 6.67                        | 7                         | 114 | 19     | -0.10             | $P < 10^{-4}$ | ***          |
| ABC                                 | 6.60                        | 5                         | 44  | 16     | -0.09             | 0.201         | n.s.         |
| GroupIV_e                           | 6.70                        | 6                         | 13  | 7      | -0.17             | 0.195         | n.s.         |
| GroupIV_f                           | 6.28                        | 3                         | 4   | 3      | 0.26              | 0.323         | n.s.         |
| GroupIV_s                           | 6.69                        | 8                         | 12  | 10     | 0.10              | 0.326         | n.s.         |
| Synthase_CPS3                       | 6.57                        | 2                         | 23  | 4      | 0.05              | 0.449         | n.s.         |
| Synthase_HAS                        | 6.57                        | 2                         | 4   | 3      | -0.69             | 0.018         | *            |
| PGA                                 | 6.53                        | 2                         | 10  | 3      | 0.28              | 0.019         | *            |
| Average (all capsules) <sup>a</sup> | 6.65                        |                           |     | 15     | 0.03              | 0.17          | n.s.         |
| Total (per genome) <sup>b</sup>     | 6.65                        |                           |     | 36     | 0.46              | $P < 10^{-4}$ | ***          |

<sup>a</sup> All capsules groups together.

<sup>b</sup> All capsules per genome taken together

After phylogenetic correction:

| Capsule group          | Pagel's Lambda | Correlation (PIC,rho) | p-value (PIC) | GEE <sup>a</sup> | GEE <sup>b</sup> |
|------------------------|----------------|-----------------------|---------------|------------------|------------------|
| Group I                | 0.943          | 0.033                 | 0.284         | $P < 10^{-4}$    | $P < 10^{-4}$    |
| ABC                    | 0.959          | 0.112                 | 0.113         | $P < 10^{-4}$    | $P < 10^{-4}$    |
| Synthase_CPS3          | 0.385          | 0.079                 | 0.388         | $P < 10^{-4}$    | $P < 10^{-4}$    |
| Synthase_HAS           | 0.753          | -0.517                | 0.162         | 0.086            | 0.482            |
| PGA                    | 0.999          | -0.012                | 0.932         | 0.252            | 0.131            |
| Average (all capsules) | 0.83           | -                     | -             | -                | -                |
| Total (per genome)     | 0.983          | 0.11                  | $P < 10^{-4}$ | $P < 10^{-4}$    | $P < 10^{-4}$    |

<sup>a</sup> Calculations performed as Capsule length ~ Genome size (log)

<sup>b</sup> Calculations performed as Genome size (log) ~ Capsule length