

Additional table 2: Table of gap parameters used for matrices at similar entropy levels that resulted in the highest coverage.

| Matrix   | Database | gap open<br>penalty | gap extension<br>penalty | Coverage |
|----------|----------|---------------------|--------------------------|----------|
| BLOSUM50 | ASTRAL20 | -15                 | -1                       | 0.1474   |
| PFASUM59 | ASTRAL20 | -16                 | -1                       | 0.1688   |
| BLOSUM62 | ASTRAL20 | -10                 | -1                       | 0.1465   |
| PFASUM78 | ASTRAL20 | -9                  | -1                       | 0.1546   |
| PAM250   | ASTRAL20 | -9                  | -3                       | 0.1105   |
| PFASUM45 | ASTRAL20 | -14                 | -1                       | 0.1658   |
| VTML160  | ASTRAL20 | -16                 | -1                       | 0.1566   |
| PFASUM67 | ASTRAL20 | -15                 | -1                       | 0.1587   |
| VTML200  | ASTRAL20 | -14                 | -1                       | 0.1598   |
| PFASUM51 | ASTRAL20 | -15                 | -1                       | 0.1672   |
| BLOSUM50 | ASTRAL40 | -11                 | -2                       | 0.4371   |
| PFASUM59 | ASTRAL40 | -11                 | -2                       | 0.4416   |
| BLOSUM62 | ASTRAL40 | -10                 | -1                       | 0.4346   |
| PFASUM78 | ASTRAL40 | -10                 | -1                       | 0.4372   |
| PAM250   | ASTRAL40 | -10                 | -2                       | 0.4024   |
| PFASUM45 | ASTRAL40 | -13                 | -1                       | 0.4448   |
| VTML160  | ASTRAL40 | -15                 | -1                       | 0.4386   |
| PFASUM67 | ASTRAL40 | -9                  | -3                       | 0.4388   |
| VTML200  | ASTRAL40 | -14                 | -1                       | 0.4392   |
| PFASUM51 | ASTRAL40 | -17                 | -1                       | 0.4418   |
| BLOSUM50 | ASTRAL70 | -15                 | -1                       | 0.5420   |
| PFASUM59 | ASTRAL70 | -14                 | -1                       | 0.5449   |
| BLOSUM62 | ASTRAL70 | -9                  | -1                       | 0.5402   |
| PFASUM78 | ASTRAL70 | -9                  | -1                       | 0.5433   |
| PAM250   | ASTRAL70 | -11                 | -2                       | 0.5187   |
| PFASUM45 | ASTRAL70 | -10                 | -2                       | 0.5484   |
| VTML160  | ASTRAL70 | -11                 | -2                       | 0.5448   |
| PFASUM67 | ASTRAL70 | -10                 | -2                       | 0.5433   |
| VTML200  | ASTRAL70 | -9                  | -2                       | 0.5459   |
| PFASUM51 | ASTRAL70 | -10                 | -2                       | 0.5460   |