

| | C | S | T | P | A | G | N | D | E | Q | H | R | K | M | I | L | V | F | Y | W |
|---|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|-------------------------------------|--------------------------|---------------|----|
| C | 0 | -1 | 1 | 0 | 2 | 1 | 1 | 2 | 1 | 2 | 0 | 0 | 2 | 4 | 1 | 5 | 1 | 2 | -2 | 5 |
| S | | 2 | 0 | -2 | 0 | -1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | -1 | 1 | 1 | -1 |
| T | 9 | | 2 | -1 | -1 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | 0 | -1 | 1 | 0 | 1 | 1 | 3 |
| P | -1 | 4 | | 2 | -2 | -1 | -1 | 0 | 0 | -1 | -1 | -1 | 1 | 1 | 0 | -1 | 0 | 0 | 2 | 1 |
| A | -1 | 1 | 5 | | 2 | -1 | -2 | -2 | -1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 |
| G | -3 | -1 | -1 | 7 | | 2 | 0 | -1 | -2 | 0 | 1 | 1 | 0 | 0 | -1 | 0 | -1 | 1 | 2 | 4 |
| N | 0 | 1 | 0 | -1 | 4 | | 3 | -1 | -1 | 0 | 0 | 1 | -1 | 0 | -1 | 0 | -1 | 0 | 0 | 0 |
| D | -3 | 0 | -2 | -2 | 0 | 6 | | 2 | -1 | -1 | -1 | 0 | -1 | 0 | 0 | 0 | 0 | 2 | 1 | 3 |
| E | -3 | 1 | 0 | -2 | -2 | 0 | 6 | | 1 | 0 | 0 | 2 | 2 | 1 | -1 | 0 | 0 | 2 | 2 | 4 |
| Q | -3 | 0 | -1 | -1 | -2 | -1 | 1 | 6 | | 0 | -2 | 0 | 1 | 1 | -1 | 0 | 0 | 1 | 3 | 3 |
| H | -4 | 0 | -1 | -1 | -1 | -2 | 0 | 2 | 5 | | 2 | -1 | 0 | 1 | 0 | -1 | 0 | 1 | 2 | 2 |
| R | -3 | 0 | -1 | -1 | -1 | -2 | 0 | 0 | 2 | 5 | | -1 | -1 | 0 | -1 | 1 | 0 | 1 | 3 | -4 |
| K | -3 | -1 | -2 | -2 | -2 | -2 | 1 | -1 | 0 | 0 | 8 | | 1 | -2 | -1 | 1 | 1 | 2 | 3 | 1 |
| M | -3 | -1 | -1 | -2 | -1 | -2 | 0 | -2 | 0 | 1 | 0 | 5 | | -2 | -1 | -1 | 0 | 1 | 2 | 4 |
| I | -3 | 0 | -1 | -1 | -1 | -2 | 0 | -1 | 1 | 1 | -1 | 2 | 5 | | -1 | 1 | 0 | 0 | 1 | 3 |
| L | -1 | -1 | -1 | -2 | -1 | -3 | -2 | -3 | -2 | 0 | -2 | -1 | -1 | 5 | | -1 | 0 | -1 | 1 | 2 |
| V | -1 | -2 | -1 | -3 | -1 | -4 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 1 | 4 | | 0 | 1 | 2 | 4 |
| F | -1 | -2 | -1 | -3 | -1 | -4 | -3 | -4 | -3 | -2 | -3 | -2 | -2 | 2 | 2 | 4 | | -1 | -2 | 1 |
| Y | -1 | -2 | 0 | -2 | 0 | -3 | -3 | -3 | -2 | -2 | -3 | -3 | -2 | 1 | 3 | 1 | 4 | | -1 | 2 |
| W | -2 | -2 | -2 | -4 | -2 | -3 | -3 | -3 | -3 | -3 | -1 | -3 | -3 | 0 | 0 | 0 | -1 | 6 | | -1 |
| C | -2 | -2 | -2 | -3 | -2 | -3 | -2 | -3 | -2 | -1 | 2 | -2 | -2 | -1 | -1 | -1 | -1 | 3 | 7 | |
| S | -2 | -3 | -2 | -4 | -3 | -2 | -4 | -4 | -3 | -2 | -2 | -3 | -3 | -1 | -3 | -2 | -3 | 1 | 2 | 11 |
| T | C <td>S <td>T <td>P <td>A <td>G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td> | S <td>T <td>P <td>A <td>G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td> | T <td>P <td>A <td>G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td> | P <td>A <td>G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td> | A <td>G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td> | G <td>N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td></td> | N <td>D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td></td> | D <td>E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td></td> | E <td>Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td></td> | Q <td>H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td></td> | H <td>R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td></td> | R <td>K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td></td> | K <td>M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td></td> | M <td>I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td></td> | I <td>L <td>V <td>F <td>Y <td>W </td></td></td></td></td> | L <td>V <td>F <td>Y <td>W </td></td></td></td> | V <td>F <td>Y <td>W </td></td></td> | F <td>Y <td>W </td></td> | Y <td>W </td> | W |

FIGURE 27.6. Amino acid scoring matrix. The matrix called BLOSUM62 is shown here. (Redrawn from Henikoff S. and Henikoff J.G. 1992. *Proc. Natl. Acad. Sci.* **89**: 10915–10919, Fig. 2.)