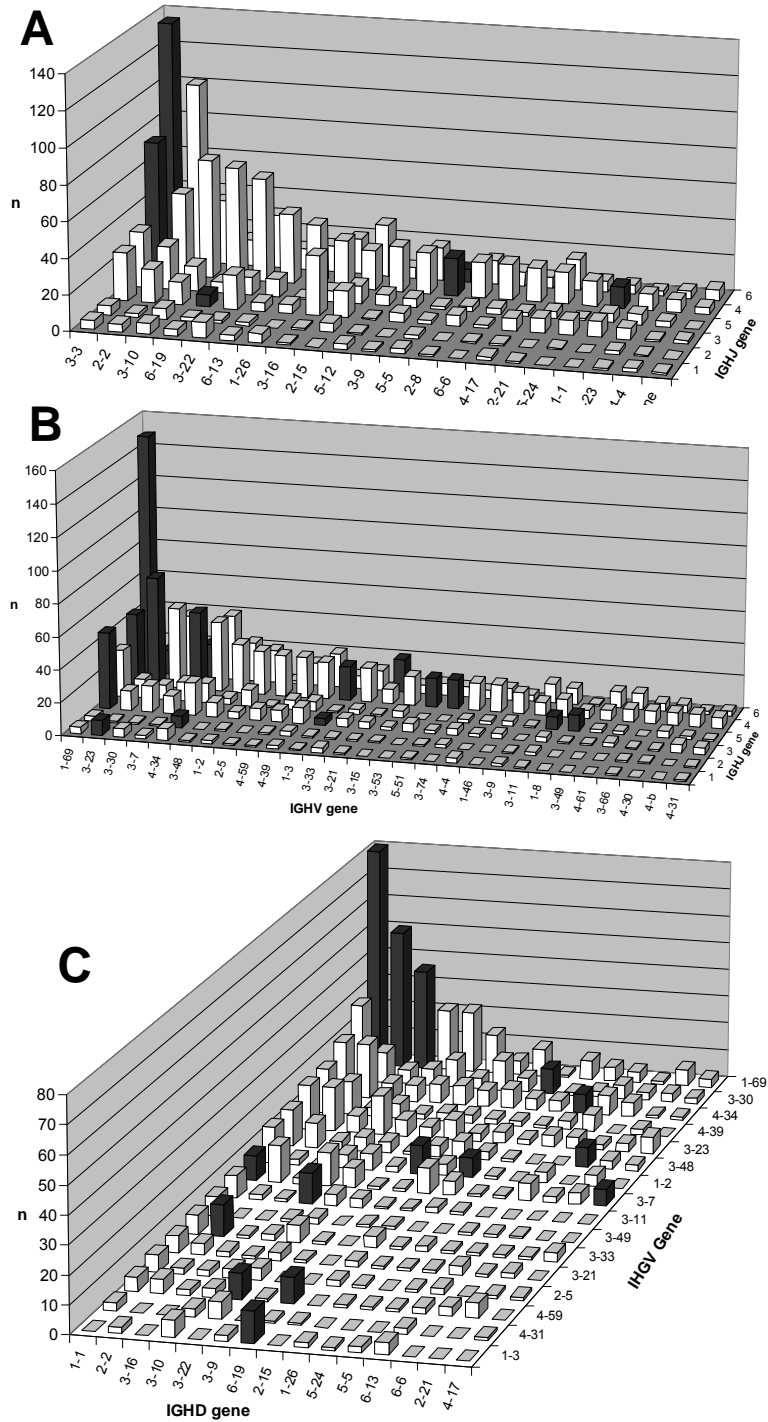


Supplemental Table I. Statistical evaluation of V-D, V-J, and J-D association frequencies.

| IGHV | IGD  | $n_{VD} (n_V) (n_D)$ | p value | IGHV | IGHJ | $n_{VJ} (n_V) (n_J)$ | p value | IGHJ | IGD | $N_{DJ} (n_D) (n_J)$ | p value |
|------|------|----------------------|---------|------|------|----------------------|---------|------|-----|----------------------|---------|
| 1-2  | 1-26 | 7 (64) (60)          | 0.006   | 1-3  | J4   | 21 (36) (629)        | 0.024   | 1-01 | 4   | 12 (31) (629)        | 0.019   |
| 1-2  | 6-19 | 10 (64) (97)         | 0.003   | 1-69 | J6   | 149 (276) (505)      | <0.001  | 3-03 | 6   | 135 (277) (505)      | 0.007   |
| 1-3  | 6-19 | 11 (36) (97)         | <0.001  | 1-69 | J4   | 44 (276) (629)       | <0.001  | 3-03 | 4   | 74 (277) (629)       | <0.001  |
| 1-69 | 2-2  | 50 (276) (196)       | 0.002   | 1-69 | J3   | 47 (276) (204)       | 0.029   | 4-4  | 4   | 7 (18) (629)         | 0.010   |
| 1-69 | 3-16 | 36 (276) (87)        | <0.001  | 1-8  | J5   | 10 (17) (152)        | <0.001  | 5-5  | 6   | 7 (37) (505)         | <0.001  |
| 1-69 | 3-3  | 80 (276) (277)       | <0.001  | 2-05 | J4   | 25 (36) (629)        | <0.001  | 5-5  | 4   | 21 (37) (629)        | <0.001  |
| 3-11 | 3-10 | 11 (35) (141)        | <0.001  | 3-07 | J6   | 21 (95) (505)        | 0.030   | 6-19 | 3   | 7 (97) (204)         | 0.027   |
| 3-30 | 1-26 | 9 (119) (60)         | 0.041   | 3-07 | J4   | 48 (95) (629)        | 0.030   |      |     |                      |         |
| 3-33 | 2-2  | 11 (45) (196)        | 0.020   | 3-11 | J5   | 8 (35) (152)         | 0.014   |      |     |                      |         |
| 3-48 | 6-6  | 7 (68) (34)          | <0.001  | 3-15 | J4   | 18 (30) (629)        | 0.025   |      |     |                      |         |
| 3-49 | 3-3  | 7 (19) (277)         | 0.041   | 3-21 | J6   | 20 (36) (505)        | 0.003   |      |     |                      |         |
| 3-7  | 3-3  | 9 (95) (277)         | 0.026   | 3-23 | J6   | 15 (117) (505)       | <0.001  |      |     |                      |         |
| 3-7  | 4-17 | 6 (95) (37)          | 0.019   | 3-23 | J4   | 68 (117) (629)       | <0.001  |      |     |                      |         |
| 4-31 | 3-22 | 6 (17) (128)         | <0.001  | 3-23 | J1   | 9 (117) (52)         | 0.011   |      |     |                      |         |
| 4-34 | 5-5  | 7 (129) (37)         | 0.029   | 3-53 | J4   | 18 (30) (629)        | 0.025   |      |     |                      |         |
| 4-59 | 3-22 | 9 (54) (128)         | 0.032   | 4-34 | J2   | 7 (129) (35)         | 0.019   |      |     |                      |         |
| 4-59 | 6-19 | 9 (54) (97)          | 0.002   | 5-51 | J4   | 18 (28) (629)        | 0.009   |      |     |                      |         |

Supplemental Table II. Light chain gene use among several cluster pairs.

| cluster | V              | J           | %<br>mutation |
|---------|----------------|-------------|---------------|
| 44      | $\kappa$ 1-33  | $\kappa$ 4  | 0.0%          |
|         | $\kappa$ 1-33  | $\kappa$ 4  | 0.0%          |
| 47      | $\kappa$ 1-5   | $\kappa$ 2  | 3.6%          |
|         | $\kappa$ 1-39  | $\kappa$ 2  | 6.8%          |
| 48      | $\kappa$ 3-20  | $\kappa$ 2  | 3.6%          |
|         | $\kappa$ 3-20  | $\kappa$ 2  | 4.1%          |
| 8       | $\kappa$ 2-28  | $\kappa$ 5  | 0.0%          |
|         | $\kappa$ 2-28  | $\kappa$ 1  | 0.5%          |
| 59      | $\kappa$ 2-28  | $\kappa$ 2  | 0.0%          |
|         | $\kappa$ 2-28  | $\kappa$ 4  | 0.0%          |
| 62      | $\lambda$ 3-21 | $\lambda$ 3 | 1.4%          |
|         | $\lambda$ 3-21 | $\lambda$ 3 | 1.4%          |
| 65      | $\lambda$ 1-51 | $\lambda$ 3 | 0.0%          |
|         | $\lambda$ 1-51 | $\lambda$ 3 | 0.5%          |
| 67      | $\kappa$ 3-20  | $\kappa$ 4  | 0.0%          |
|         | $\kappa$ 3-20  | $\kappa$ 4  | 0.0%          |



**Supplemental Figure 1. Pairwise association of V, D, and J genes.** The number of occurrences of each D-J (A), V-J (B), and V-D (C) pair is shown. The dark bars indicate statistically significant values, as determined by Chi squared statistics.