**Supplementary File 2.** Table summarizing ∆G of PD-1/BTLA:SHP1/SHP2-tSH2 interactions in a parallel or an anti-parallel mode.

|  |  |  |
| --- | --- | --- |
| ∆G (kJ/mol)a | Parallel | Anti-Parallel |
| PD-1:SHP1-tSH2 | -70.4 | -40.4 |
| PD-1:SHP2-tSH2 | -76.6 | -72.5 |
| BTLA:SHP1-tSH2 | -75.7 | -32.8 |
| BTLA:SHP2-tSH2 | -70.9 | -66.4 |

a: ∆G = RT\*ln (Kd), showing the change of Gibbs free energy;

T = 298.15 K, R is molar gas constant, R = 8.314 × 10-3 kJ/K/M