**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