

**Table S1. Components of binding free energy (in kcal/mol) of Bcl-XL with Bad peptide**

	<b>Bcl-XL/Bad</b>		<b>Bcl-XL</b>		<b>Bad</b>		<b>Delta</b>
	<b>Average</b>	<b>Std</b>	<b>Average</b>	<b>Std</b>	<b>Average</b>	<b>Std</b>	
ELE	-6093.7	108.3	-4657.6	100.3	-938.9	42.0	-497.2
VDW	-749.5	25.7	-585.7	22.4	-46.2	8.0	-117.6
GAS	-3181.2	114.8	-2048.9	105.1	-517.5	43.4	-614.8
PBSUR	62.6	1.84	58.4	1.19	17.7	0.34	-13.4
PB	-3669.5	117.3	-3490.5	106.0	-736.3	39.2	557.3
PBSOL	-3606.9	115.9	-3432.1	105.1	-718.6	39.2	543.9
PBELE	-9763.2	38.6	-8148.1	32.9	-1675.2	9.54	60.0
<b>PBTOT</b>	<b>-6788.1</b>	<b>50.6</b>	<b>-5481.0</b>	<b>46.9</b>	<b>-1236.2</b>	<b>16.5</b>	<b>-71.0</b>
TSTRA	16.8	0	16.6	0	15.0	0	-14.9
TSROT	17.0	0	16.8	0	14.4	0	-14.2
TSVIB	2234.3	9.0	1934.0	7.0	324.5	2.2	-24.2
<b>TSTOT</b>	<b>2268.1</b>	<b>9.0</b>	<b>1967.5</b>	<b>7.0</b>	<b>353.9</b>	<b>2.2</b>	<b>-53.3</b>
<b><math>\Delta G_{\text{bind}}</math></b>							<b>-17.7</b>

Electrostatic energy (ELE); van der Waals contribution (VDW); total gas phase energy (GAS); nonpolar contribution to the solvation free energy (PBSUR); the electrostatic contribution to the solvation free energy (PB); sum of nonpolar and polar contributions to solvation (PBSOL); sum of the electrostatic solvation free energy and MM electrostatic energy (PBELE); final estimated binding free energy (PBTOT); translational energy (TSTRA); rotational energy (TSROT); vibrational energy (TSVIB), total entropic contribution (TSTOT); binding free energy ( $\Delta G_{\text{bind}}$ )