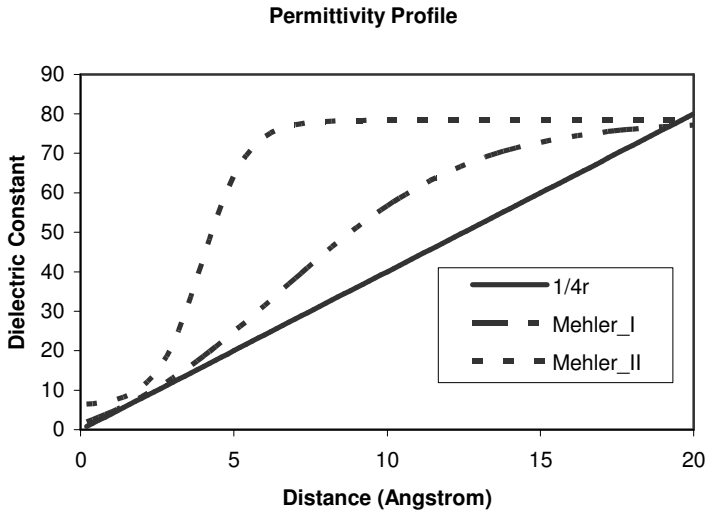
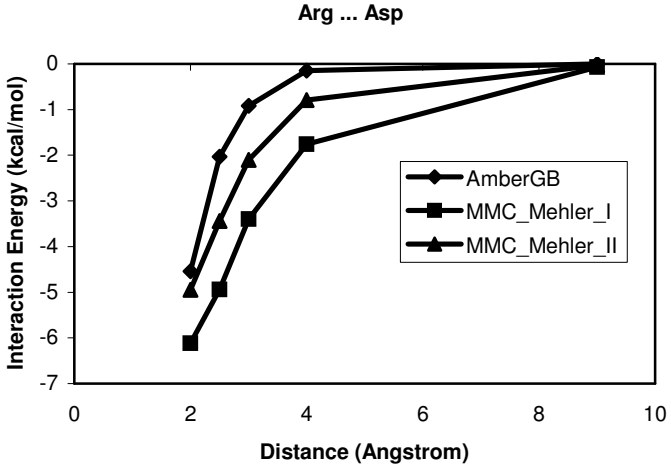
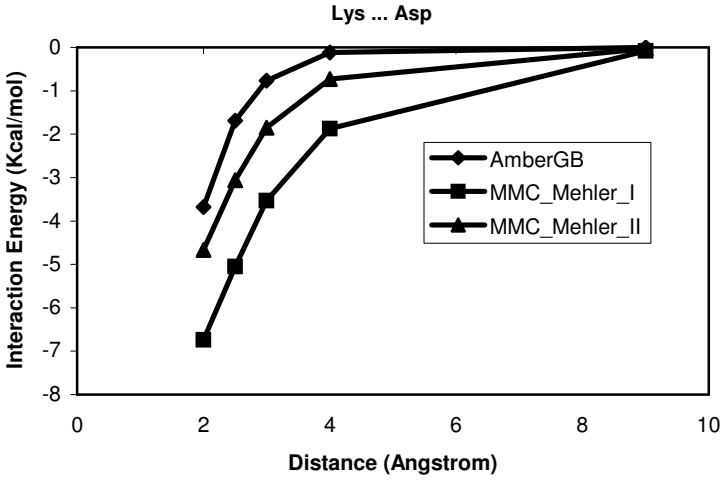
Supplementary data



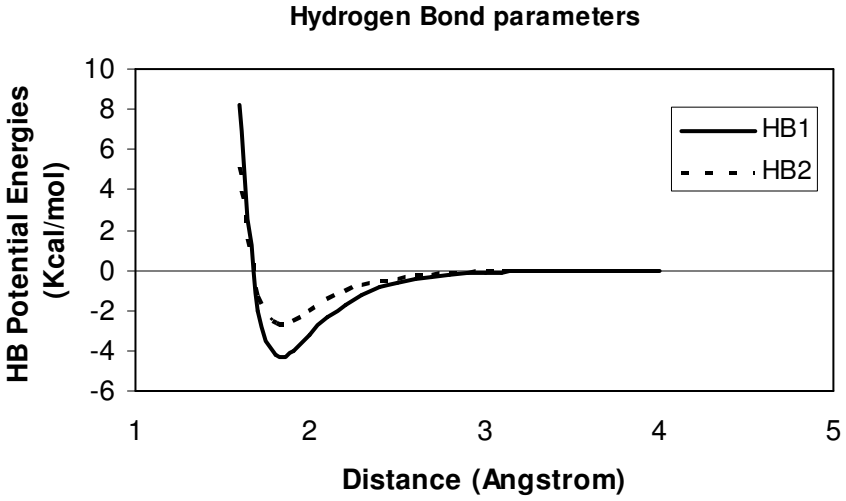
Supplementary Figure 1. The permittivity profiles for distance dependent dielectric constant (1/4r) and two set of parameters of Mehler's model: Mehler_I (A = 6.02944, λ = 0.018733345 and k = 213.5782) and Mehler_II (A =-8.5525, λ = 0.003627 and k = 7.7839).



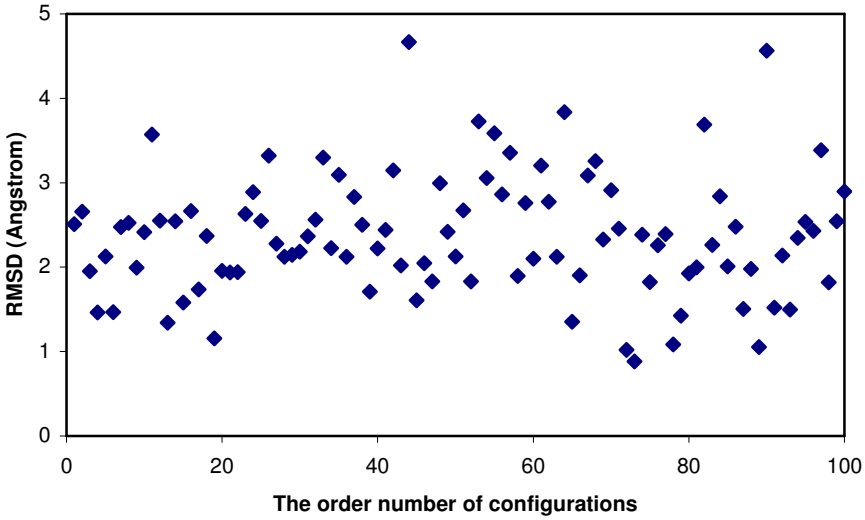
Supplementary Figure 2. The electrostatics interaction energies vs. distance between two charged residues (Arg and Asp) by using the Generalized Born (GB) model of Amber program, and two different sets of parameters for Mehler's model by using MMC program.



Supplementary Figure 3. The electrostatics interaction energies vs. distance between two charged residues (Lys and Asp) by using the Generalized Born (GB) model of Amber program, and two different sets of parameters for Mehler's model by using MMC program.



Supplementary Figure 4. Two type's hydrogen bonds are considered: backbone (C_{12}/C_{10} are 29513.0/10628.0), and side chains (C_{12}/C_{10} are 18444.0/6642.0, no HB energy terms are added for salt bridges).



Supplementary Figure 5. The RMSD difference of predicted loop configurations of 8tln (248-255) before and after LMMC simulated annealing (**Figures 3** and **4**).

Supplementary Table 1. The average RMSD (in Å) difference of predicted loop configurations before and after LLMC simulated annealing, and the correlation coefficients of total energies vs. RMSD.

PDB Code	Loop	Length	RMSD_AVE	Correlation Coefficient
2apr	76-83	8	2.61	0.505
8abp	203-208	6	1.84	0.211
2act*	198-205	8	2.39	0.233
8tln*	E32-E38	7	2.53	0.166
3grs*	83-89	7	2.99	0.222
5cpa	231-237	7	2.40	0.073
2fb4*	H26-H32	7	2.27	0.020
2fbj*	H100-H106	7	1.85	0.186
8tln*	E248-E255	8	2.37	0.257
3sgb	E199-E211	9	1.57	0.488
3dfr	20-23	4	1.57	0.285
3dfr	89-93	5	1.27	0.588
3dfr	120-124	5	2.17	0.442
3blm	131-135	5	1.57	0.587