



Figure S13: Steered MD, umbrella sampling data and biased statistics obtained from the QM/MM simulations of TadA*-RNA systems. 3 individual pmfs that were used to compute the average pmf for the deprotonation reaction along the ξ for (A) TadA*0.1-RNA, (B) TadA*1.1-RNA, (C) TadA*0.1(L84F)-RNA, and (D) TadA*1.1(L84F)-RNA. In each pmf profile the shaded region indicated the standard deviation of the average pmfs. The right extreme signifies that shared proton resides entirely on the activated water and the left extreme signifies that the shared proton resides entirely on the Glu⁵⁹O atom.