

## Description of Additional Supplementary Files

**File Name:** Supplementary Movie 1

**Description:** VSD upward change in the R2 rotamer orientation of approximately 6 Å while R3 reorients ~5 Å

**File Name:** Supplementary Movie 2

**Description:** Reorientation of D175 at S3 and D142 at S2, with state-dependent interactions between R2 and D175 and D142.

**File Name:** Supplementary Movie 3

**Description:** At 0  $\text{Ca}^{2+}$ , residue Y212 (S4) is packed between the backbone nitrogen of I209 and R100 (S1) between S4 and S1

**File Name:** Supplementary Movie 4

**Description:** side-chain rotations of residues F304 and I308

**File Name:** Supplementary Data 1

**Description:**

MD trajectories

-initial and final coordinates

HOLE program analysis

-output