SUPPLEMENT

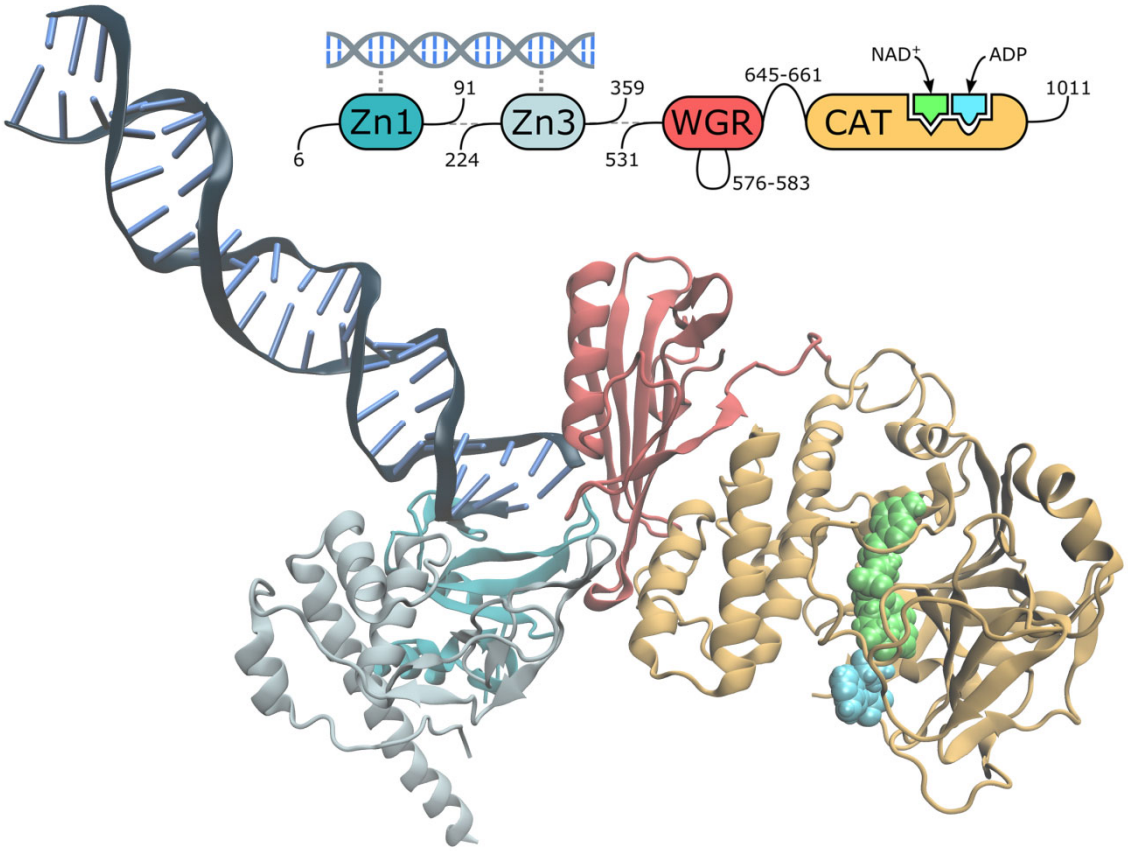

Fig. S1. Overall view of the MD model of the PARP-1 enzyme–substrate complex with NAD^+ and ADP.

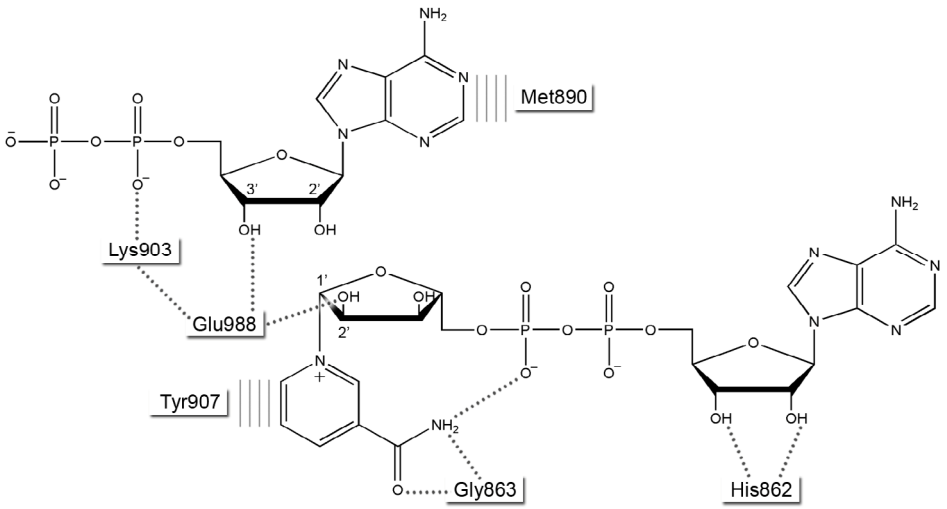

Fig. S2. Schematic representation of important interactions in the PARP-1 active site revealed by MD simulation. The NAD^+ molecule and the ADP molecule as a mimic of the PAR chain end are shown.

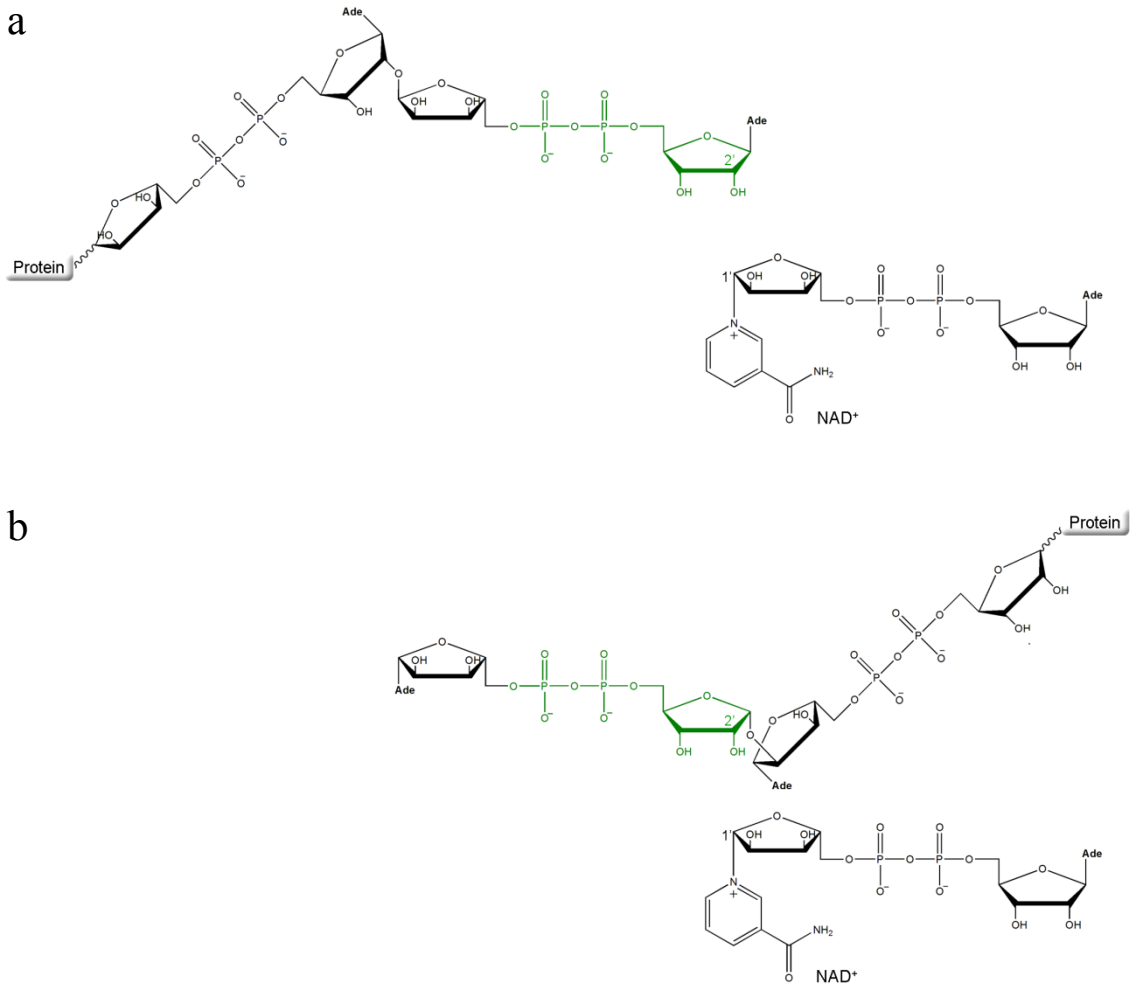

Fig. S3. Schematic representation of the relative orientation of NAD^+ and PAR for the elongation (a) and branching (b) reactions catalyzed by PARP-1. The attacking PAR ribose and the adjacent pyrophosphate group, whose position does not undergo significant changes upon a 180° rotation of the polymer, are shown in green.