Supplementary Figures.

Suppl. Fig. 1. Analysis of the oligomeric state of MuA in 'D' complexes. Crosslinking of type I (cleaved complex) and 'D' complex (DC) with DSP, a sulfhydryl reversible crosslinking agent, was carried out as described by Lavoie et al., 1991. The crosslinks were partially reversed by incubation at 65°C prior to resolution of MuA oligomers by SDS-agarose-acrylamide composite gel electrophoresis, followed by western blotting. MuA is tetrameric in both type I and type II complexes.

Suppl. Fig. 2. 'D' is composed of an equal mixture of products disintegrated at the left or right end of Mu. (**A**) Restriction analysis of D. Lanes 1-4 correspond to undigested plasmid target, donor, θ ST and D, respectively. Lanes 5-8 and 9-12 correspond to the same substrates digested with NdeI or XmnI as indicated. Reactions were electrophoresed on 1% agarose gels and visualized by ethidium bromide staining. M, marker lanes. (**B**) Cartoon showing location of the restriction sites, and expected products of digestion of D disintegrated at either Mu end. L and R, left and right Mu ends; X and N, XmnI and NdeI; a-f, expected products of D digestion. NdeI would generate two products if only one specific end participated in disintegration, and four if either end did; four were observed (**A**). Similarly for XmnI, which would give one product if only one end disintegrated, and two if either end did; two were observed. The proportion of products obtained was indicative of near equal reaction at each end.

Suppl. Fig. 3. 2D-analysis of 'D' with mung-bean nuclease. (**A**) 3'OH ends in D were labeled with (α-^{32}P)-cordycepin phosphate using terminal transferase. The reaction was then divided into two halves and incubated with (+) or without (-) 1U of mung bean nuclease (New England Biolabs) at 37^{o}C for 10 min. After phenol-chloroform extraction and ethanol precipitation, the samples were resolved on a native 1% TAE agarose gel (N) in the first dimension, and on a 1.2% alkaline denaturing agarose gel (D) in the second dimension. The gels were neutralized, dried, and exposed to x-ray films. (**B**) Cartoon showing expected labeled strands i and ii in a substrate with a hairpin tail. Treatment with mung bean nuclease would cleave the hairpin strand i to give a smaller labeled strand iii. Prior to mung bean treatment, >95% of the label is in the hairpin strand i, with very small amounts of material found at the position of iii (**A**), indicating that the majority of D ends in a hairpin tail.

Suppl. Fig. 4. D* is composed of an equal mixture of products disintegrated at the left or right end of Mu. (**A**) Restriction analysis of D*. Lane 1 corresponds to D* and lane 2 to D* digested with XmnI. (**B**) Cartoon showing expected products of digestion. The different lengths of the arms on the digested circle are expected to lend different mobilities to the products. Two products would be indicative of disintegration at either end, as was observed in (**A**). These were present in nearly equal proportion, indicative of near equal reaction at each end.