The functional cooperation of SV40 T antigen monomers and hexamers is essential for viral DNA replication

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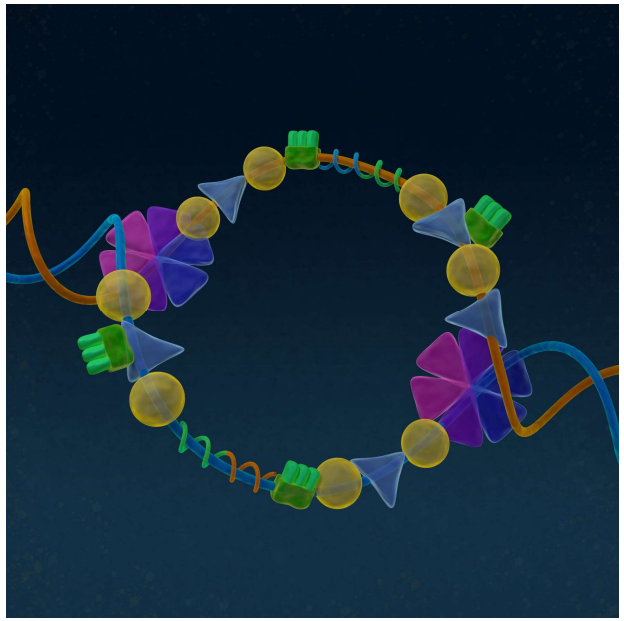
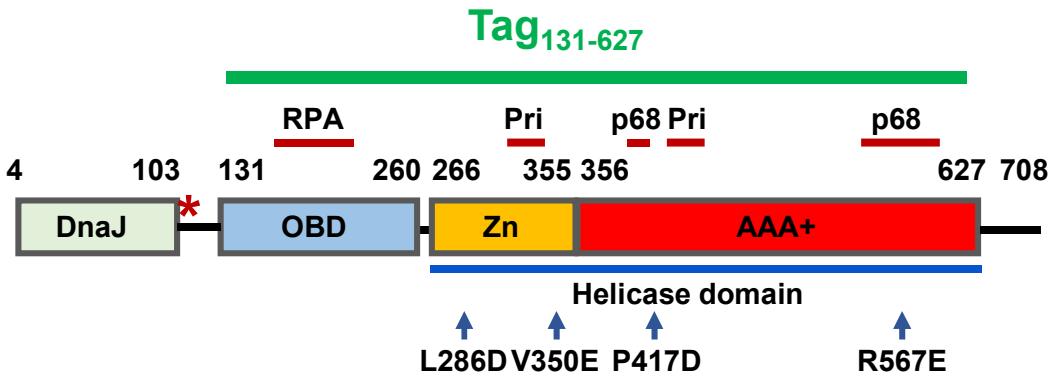


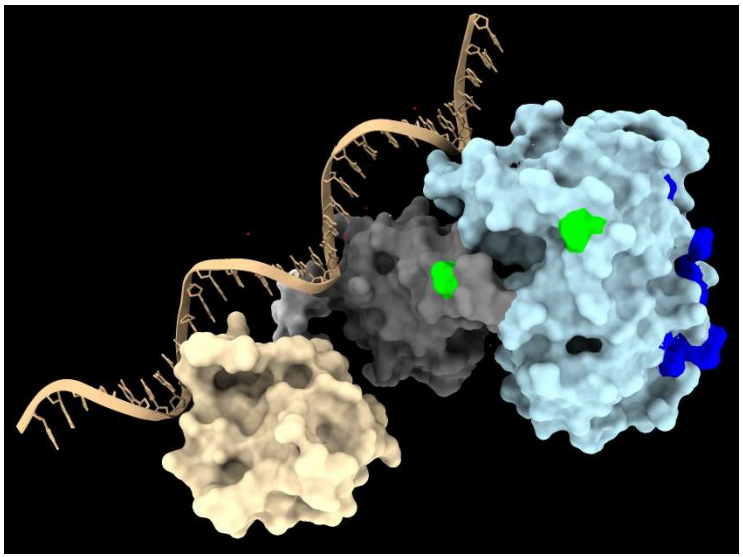
Hexameric T antigens* function at the replication fork as *helicase

***Monomeric T antigen* act as *auxiliary factors of Pol-Prim* during Okazaki fragment synthesis**

Structure of the SV40 T Antigen OBD and Helicase Domain Associated with ssDNA

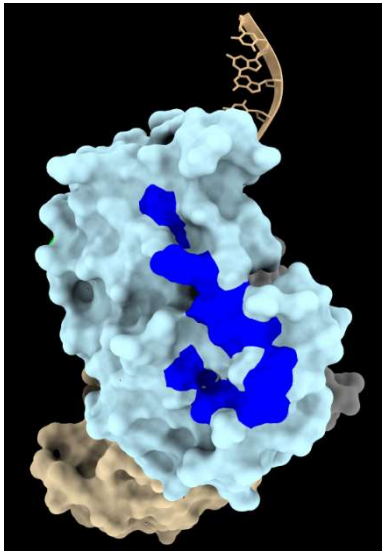


A



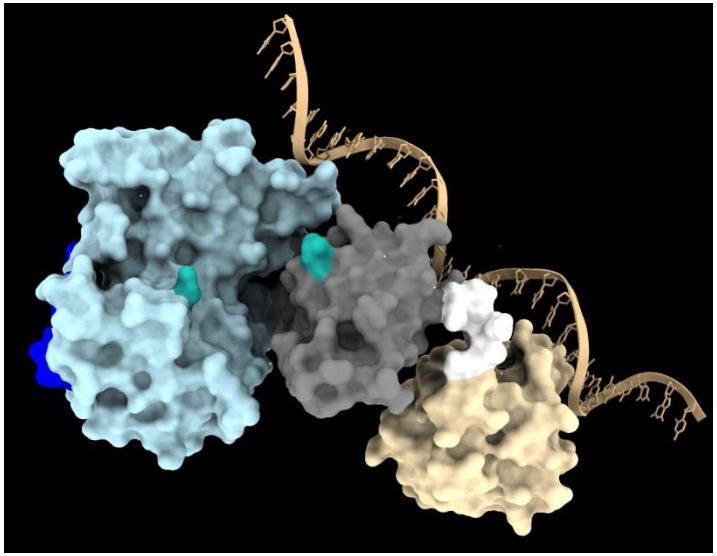
M1: Tag Monomer
SV40 $Tag_{131-627}$
(Green: V350E & P417D)

B -90 degrees



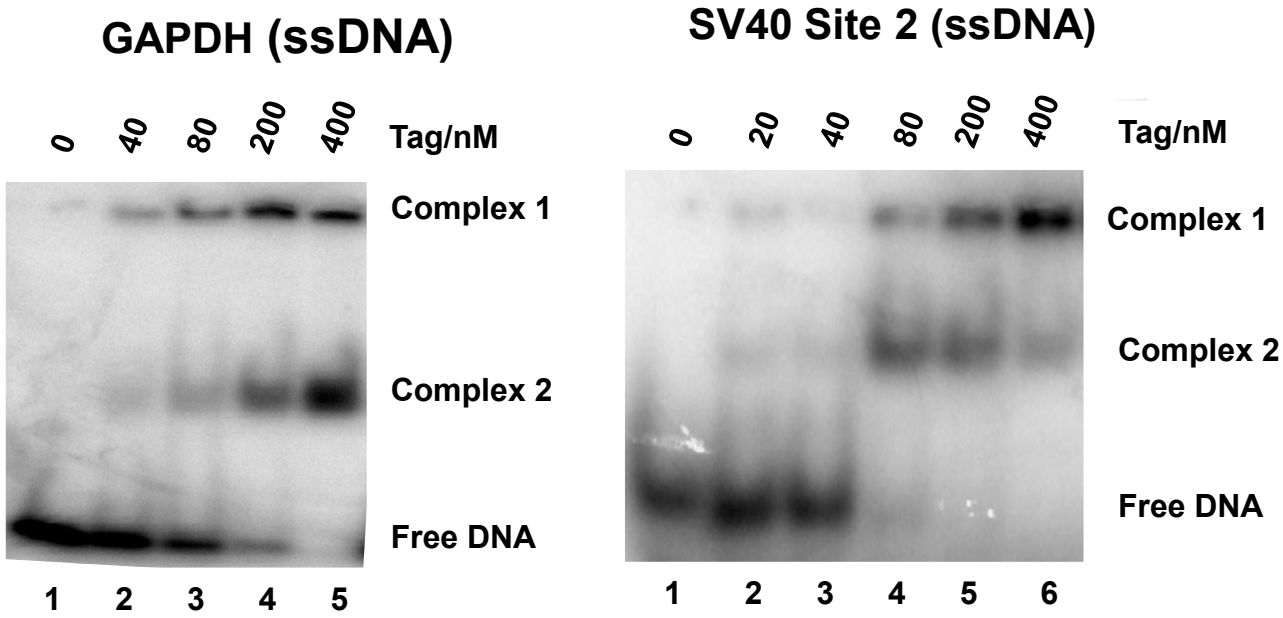
SV40 $Tag_{131-627}$
Blue: Pol-Prim p70
Binding site

C -180 degrees



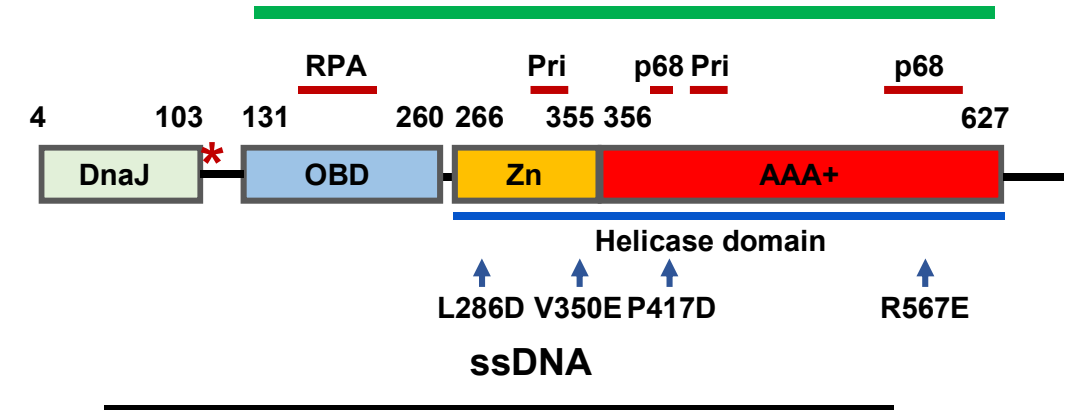
M2: Tag Monomer
SV40 $Tag_{131-627}$
(Cyan: L286D & R567E)

Full Length SV40 T antigen (Tag) Binding to ssDNA

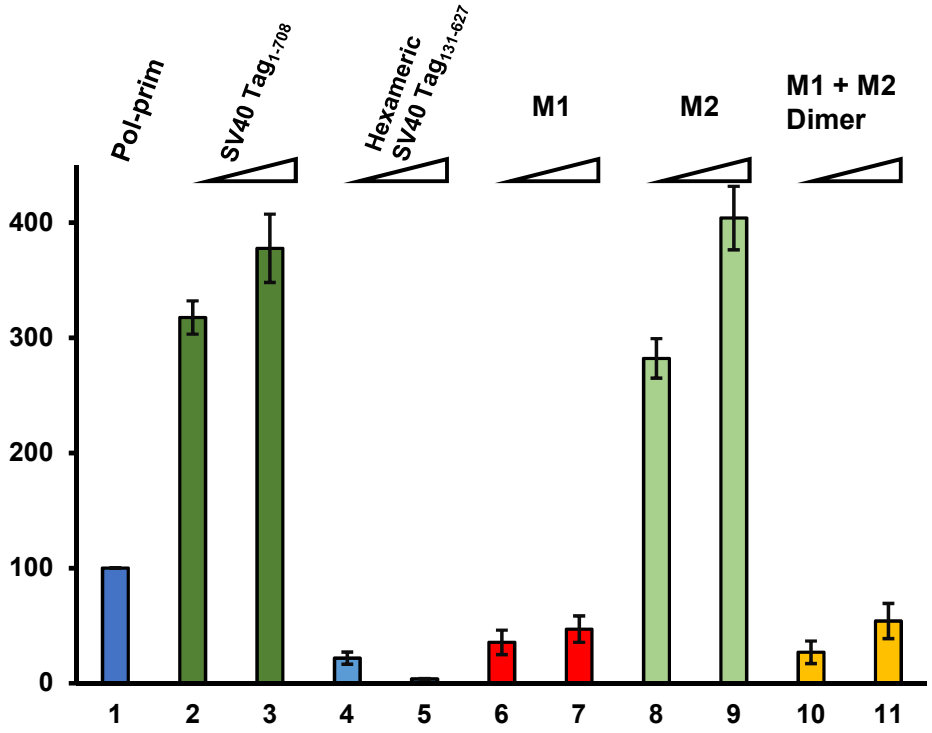


Complex 1: Tag oligomers binding to ssDNA
Complex 2: Tag monomers binding to ssDNA

Stimulation of Pol-Prim on ssDNA by monomeric and hexameric $Tag_{131-627}$



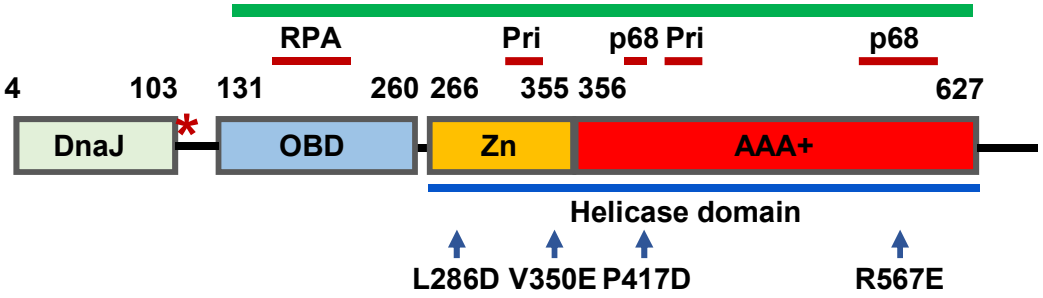
ssDNA

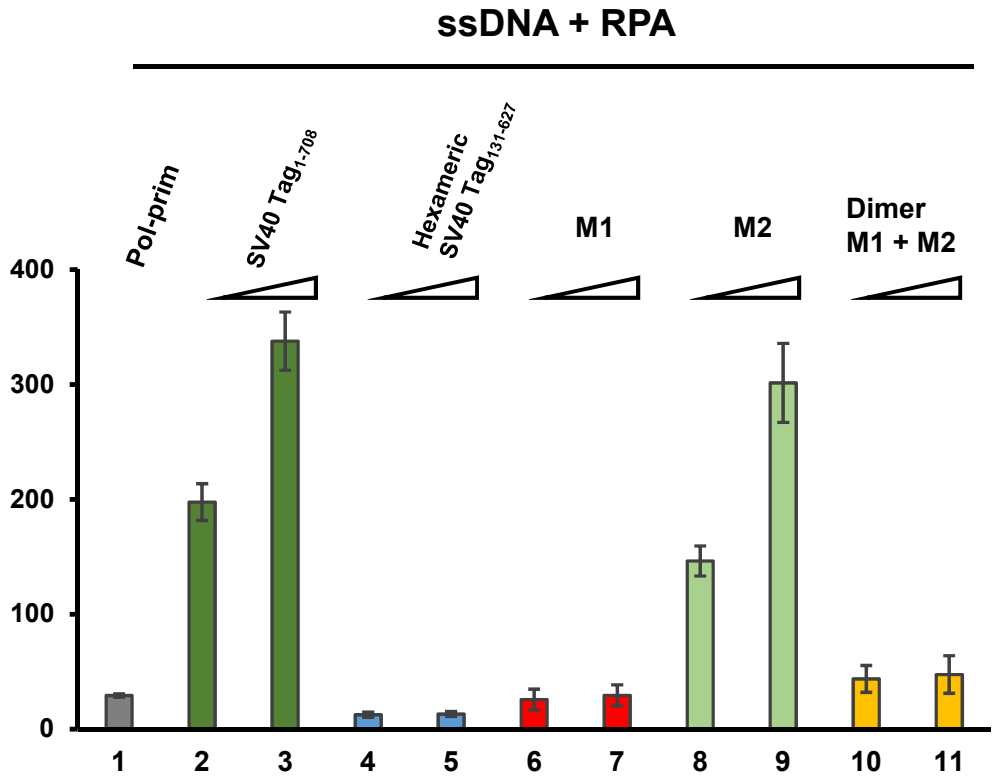


M1: Tag Monomer SV40 $Tag_{131-627}$ (V350E/P417D)

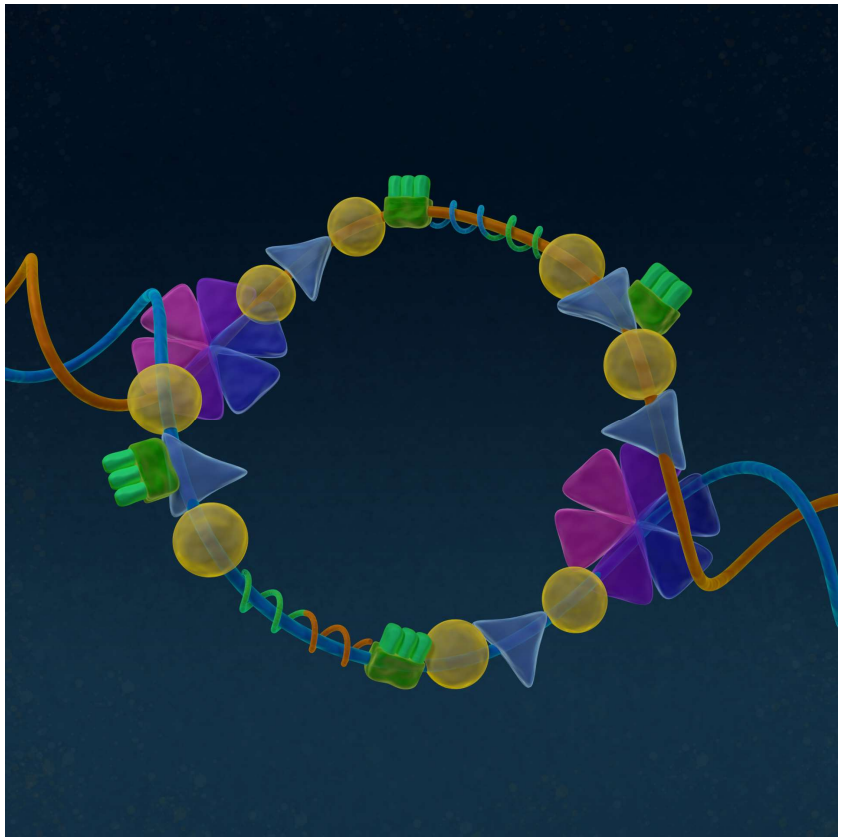
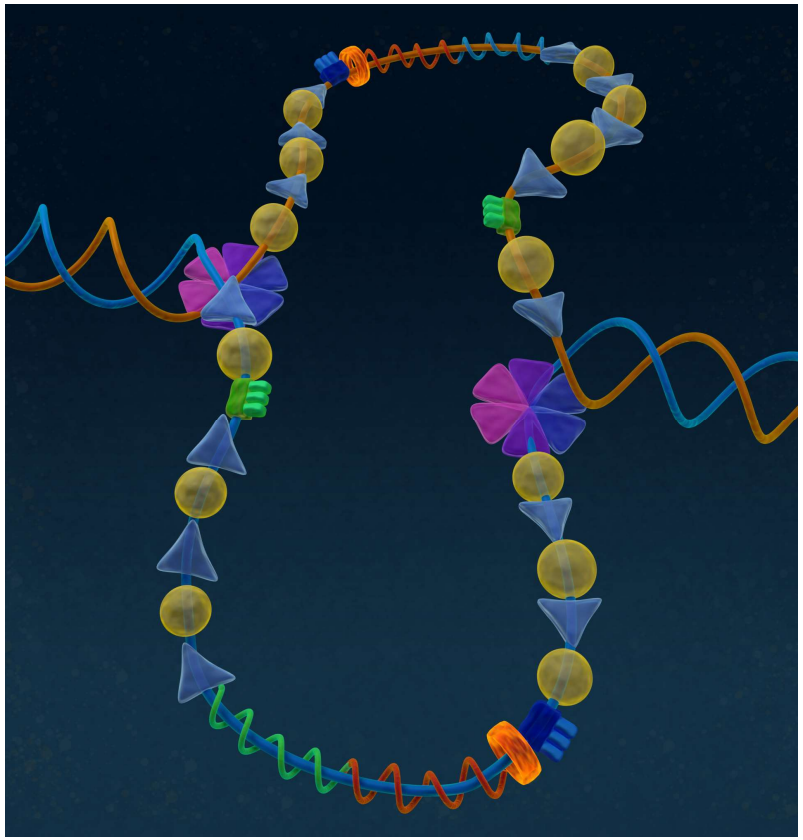
M2: Tag Monomer SV40 $Tag_{131-627}$ (L286D/R567E)

Stimulation of Pol-Prim on ssDNA + RPA by monomeric and hexameric $Tag_{131-627}$ a Model System for Okazaki Fragment Synthesis





M1: Tag Monomer SV40 $Tag_{131-627}$ (V350E/P417D)

M2: Tag Monomer SV40 $Tag_{131-627}$ (L286D/R567E)

Model of Okazaki Fragment Initiation on the Lagging Strand