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**Complexed Crystal Structure of Primosomal Protein PriB Reveals a Novel Single- Stranded DNA Binding Mode.** C.Y. Huang, C.H. Hsu, Y.J. Sun, H.N. Wu, C.D. Hsiao, Inst.t of Molecular Biology, Academia Sinica, Taipei, 115, Taiwan.

PriB is a primosomal protein required for replication restart in *Escherichia coli*. PriB stimulates PriA helicase activity via interaction with single-stranded DNA (ssDNA), but the molecular details of this interaction remain unclear. Here, we report the crystal structure of PriB in a complex with a 15-mer oligodeoxythymidylate (dT15) at 2.7 Å resolution. Although PriB shares structural similarity with the *E. coli* single-stranded DNA-binding protein (*EcoSSB*), the structure of the PriB-dT15 complex reveals that PriB and *EcoSSB* differ in the way they bind ssDNA. Filter-binding assays showed that the PriB-ssDNA interaction is salt-sensitive and cooperative. Mutational analysis confirmed that the loop L<sub>45</sub> plays an important role in ssDNA binding. We propose a cooperative binding mechanism of PriB to ssDNA and a model for the assembly of the PriA-PriB-ssDNA complex. This is the first structure showing a replication restart primosomal protein in a complex with ssDNA, and it provides a novel model to elucidate how a dimeric oligonucleotide-binding-fold protein binds ssDNA.