

## Supplementary Data

**Table S1:** Oligonucleotides used.

<b><i>SASX analysis</i></b>	
ssDNA	5'-TAC-GAA-TTG-CTT-GGA-ATC-CTG-ACG-AAC-3'
<b><i>Binding</i></b>	
ssDNA	TAMRA-5'-ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3'
dsDNA with 5' Flap	TAMRA-5'-ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' -GAT-GTC-AAG-CAG-TCC-TAA-GGA-TTC-GTG-CAG-GCA-T- 3' 5' -CAT-GAT-TAC-GAA-TTG-CT-3'
dsDNA with 3' Flap	TAMRA-5' - ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' - CAT-GAT-TAC-GAA-TTG-CTG-GAA-TCC-TGA-CGA-ACT-GTA-G-3' 5' ATT-CGT-GCA-GGC-AT-3'
<b><i>FRET DNA Bending</i></b>	
dsDNA with 5' Flap	TAMRA-5'-ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' -GAT-GTC-AAG-CAG-TCC-TAA-GGA-TTC-GTG-CAG-GCA-T- 3' 5' -CAT-GAT-TAC-GAA-TTG-CT-3'-FAM
dsDNA with 3' Flap	TAMRA-5' - ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' - CAT-GAT-TAC-GAA-TTG-CTG-GAA-TCC-TGA-CGA-ACT-GTA-G-3' 5' ATT-CGT-GCA-GGC-AT-3'-FAM
<b><i>FRET NucS Position</i></b>	
dsDNA with 5' Flap labeled in 5'	TAMRA-5'-ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' -GAT-GTC-AAG-CAG-TCC-TAA-GGA-TTC-GTG-CAG-GCA-T- 3' 5' -CAT-GAT-TAC-GAA-TTG-CT-3'
dsDNA with 5' Flap labeled in 3'	5'-ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3'- TAMRA 5' -GAT-GTC-AAG-CAG-TCC-TAA-GGA-TTC-GTG-CAG-GCA-T- 3' 5' -CAT-GAT-TAC-GAA-TTG-CT-3'
dsDNA with 3' Flap labeled in 5'	TAMRA-5' - ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3' 5' - CAT-GAT-TAC-GAA-TTG-CTG-GAA-TCC-TGA-CGA-ACT-GTA-G-3' 5' ATT-CGT-GCA-GGC-AT-3'
dsDNA with 3' Flap labeled in 3'	5' - ATG-CCT-GCA-CGA-ATA-GCA-ATT-CGT-AAT-CAT-G-3'- TAMRA 5' - CAT-GAT-TAC-GAA-TTG-CTG-GAA-TCC-TGA-CGA-ACT-GTA-G-3' 5' ATT-CGT-GCA-GGC-AT-3'
<b><i>Activity</i></b>	
dsDNA with 5' Flap	FAM-5'-AGC-TAT-GAC-CAT-GAT-TAC-GAA-TTG-CTT-GGA-ATC-CTG- ACG-AAC-TGT-AG-3' 5' CTA-CAG-TTC-GTC-AGG-ATT-CCA-AGC-AAG-CTA-CCA-TGC-CTG- CAC-GAA-TT-3' 5'-AAT-TCG-TGC-AGG-CAT-GGT-AGCT-3'

<i>dsDNA with 3' Flap</i>	5'-GAT-GTC-AAG-CAG-TCC-TAA-GGA-ATT-CGT-GCA-GGC-ATG-GTA-GCT-3'-FAM 5' AAG-CAA-TTC-GTA-ATC-ATG-GTC-ATA-GCT-CCT-TAG-GAC-TGC-TTG-ACA-TC -3' 5'-AGC-TAT-GAC-CAT-GAT-TAC-GAA-TTG-CTT-3'
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**Table S2:** Kinetic parameters of the interactions *PabPCNA*-PIP peptide and *PabPCNA*-*PabNucS*.

	$k_{ON1}$ ( $\times 10^{-3} M^{-1} \cdot s^{-1}$ )	$k_{OFF1}$ ( $\times 10^3 s^{-1}$ )	$K_{D1}$ ( $\times 10^{-6} M$ )	$k_{ON2}$ ( $\times 10^3 s^{-1}$ )	$k_{OFF2}$ ( $\times 10^3 s^{-1}$ )	$K_{D2}$ ( $\times 10^{-3}$ )	$R_{MAX}$ ( $\mu RIU$ )	$K_{DApp}$ ( $\times 10^{-6} M$ )*
<b>PIP NucS</b>	$5.1 \pm 0.1$	$47 \pm 1$	$9.2 \pm 0.3$				$20.68 \pm 0.06$	$9.2 \pm 0.3$
<b>NucS</b>	$3.48 \pm 0.07$	$22.0 \pm 0.5$	$6.3 \pm 0.2$	$4.10 \pm 0.05$	$0.86 \pm 0.01$	$210 \pm 4$	$257 \pm 53$	$1.33 \pm 0.05$

\* For systems with linked equilibria,  $K_{DApp}$  was obtained from the equation:  $K_{Dapp} = K_{D1} \times K_{D2}$ . Propagated

errors were calculated from the equation:  $\Delta K_{DApp} = K_{DApp} \sqrt{\left(\frac{\Delta K_{D1}}{K_{D1}}\right)^2 + \left(\frac{\Delta K_{D2}}{K_{D2}}\right)^2}$