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Exploring telomeric DNA-protein-DNA interactions under nanoconfinement MAEDEH ROUSHAN, PARMINDER KAUR, JIANGUO LIN, HONG WANG, ROBERT RIEHN, North Carolina State University, RIEHN LAB TEAM, WANG LAB COLLABORATION — Genomes are organized through DNA binding proteins. In particular, telomeres are organized into $\sim$ 10 kbp loops by a multi-protein complex. For understanding how proteins interact with DNA we have investigated the effect of different DNA-binding proteins on DNA configuration by injecting different proteins inside a nanofabricated channel system. DNA molecules stretch in nanochannels with a channel cross-section roughly about 100x100 nm2, so allowing analysis by observation of a fluorescent dye. The length and configuration of DNA can be directly observed, as well as the binding location of proteins. Here we show the binding patterns and molecular action of a set of telomere-associated proteins, namely TFR1, TRF2, RAP1, SA1, as well the model protein T4 DNA ligase. In particular, we demonstrate formation of stable loops, sliding, and general DNA condensation.

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