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Supplemental Information

Polymer Modeling Predicts Chromosome Reorganization in Senescence

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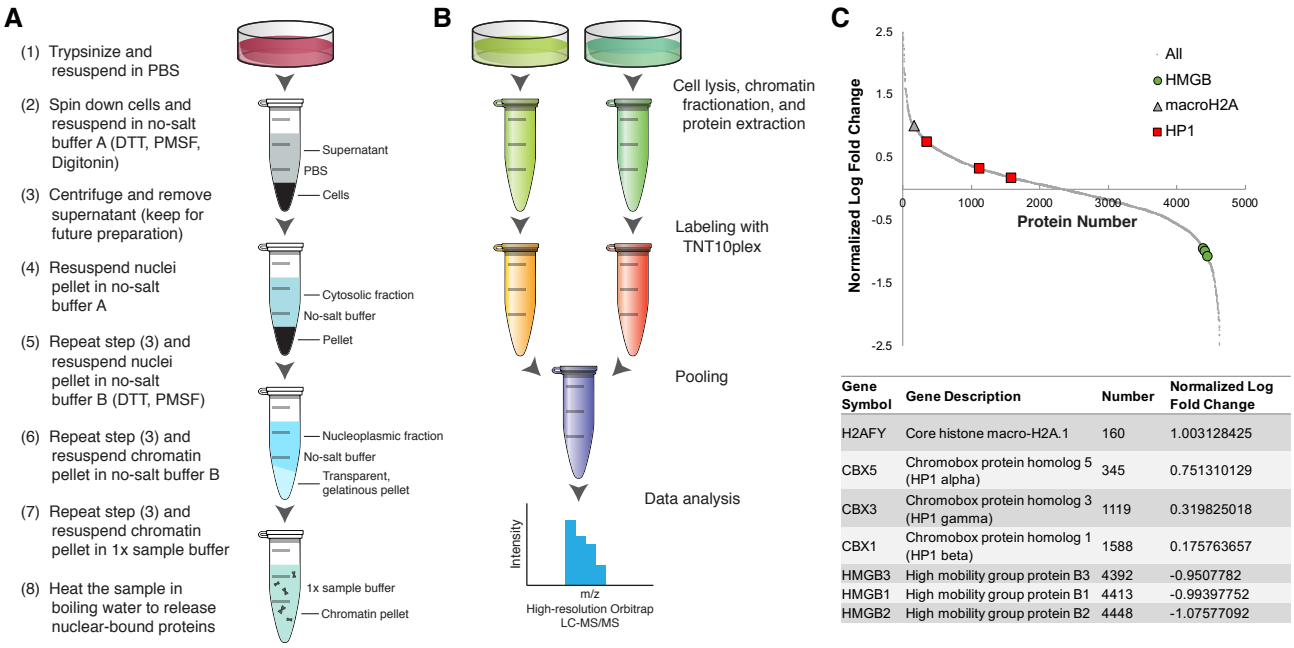
SUPPLEMENTAL FIGURES



Gene Symbol	Gene Description	Number	Normalized Log Fold Change
H2AFY	Core histone macro-H2A.1	160	1.003128425
CBX5	Chromobox protein homolog 5 (HP1 alpha)	345	0.751310129
CBX3	Chromobox protein homolog 3 (HP1 gamma)	1119	0.319825018
CBX1	Chromobox protein homolog 1 (HP1 beta)	1588	0.175763657
HMGB3	High mobility group protein B3	4392	-0.9507782
HMGB1	High mobility group protein B1	4413	-0.99397752
HMGB2	High mobility group protein B2	4448	-1.07577092

Figure S 1: **Chromatin fractionation and mass spectrometry experiments investigating the change in protein abundance between growing and senescent cells**, related to Figure **2** and STAR Methods. (A) The key stages for chromatin isolation of a single sample. (B) A schematic representation of chromatin fractionation from different samples followed by identification and quantitation of proteins based on high-resolution Orbitrap LC-MS/MS. (C) *Top*: A graph showing the normalized log fold change of individual protein abundance between growing and senescent cells. Proteins are numbered from the highest to the lowest ratio. *Bottom*: A table listing the normalized log fold change for macroH2A, HP1, and high mobility group proteins.

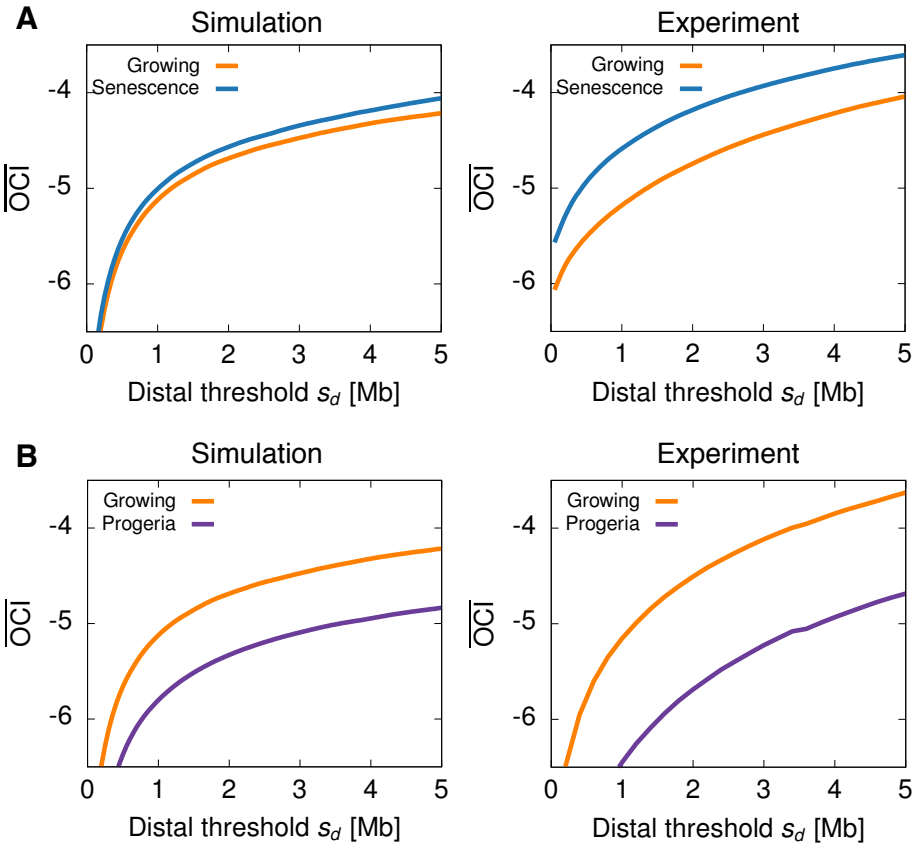


Figure S 2: **Varying the threshold s_d which distinguishes local from distal contacts does not alter the general trends for the change in the open chromatin index (OCI) between different cell states**, related to Figure **3**. (A and B) The plots compare the average OCI value between (A) growing and senescent state and (B) growing and progeroid state for different thresholds s_d. Note that the OCI increases from growing to senescence and decreases from growing to progeria for different s_d, both in simulations and in experiments.

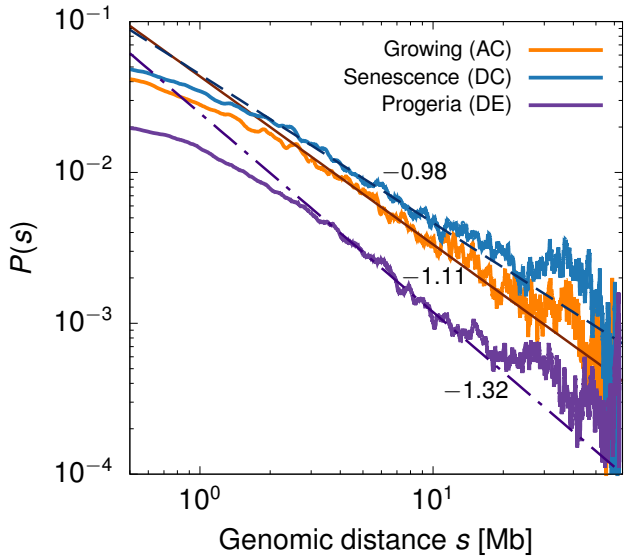


Figure S 3: **Contact probability $P(s)$ as a function of genomic distance** s, related to Figure **3**. A log-log plot showing the decay in the contact probability $P(s)$ as the genomic distance s between two chromatin segments increases, for growing (adsorbed-collapsed, AC), senescence (desorbed-collapsed, DC), and progeria (desorbed-extended, DE). Straight lines are linear fits to the log-log curves with the measured exponents c shown for the different cell states.