

Appendix

Mapping the nucleolar proteome reveals a spatiotemporal organization related to intrinsic protein disorder

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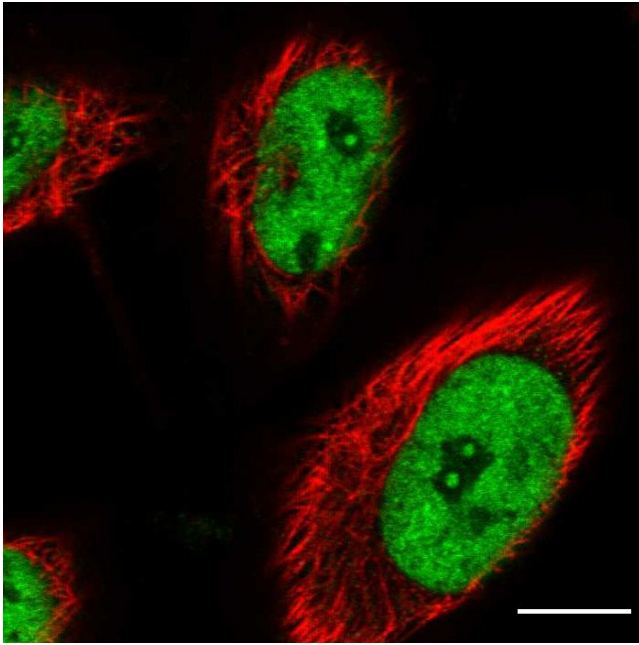
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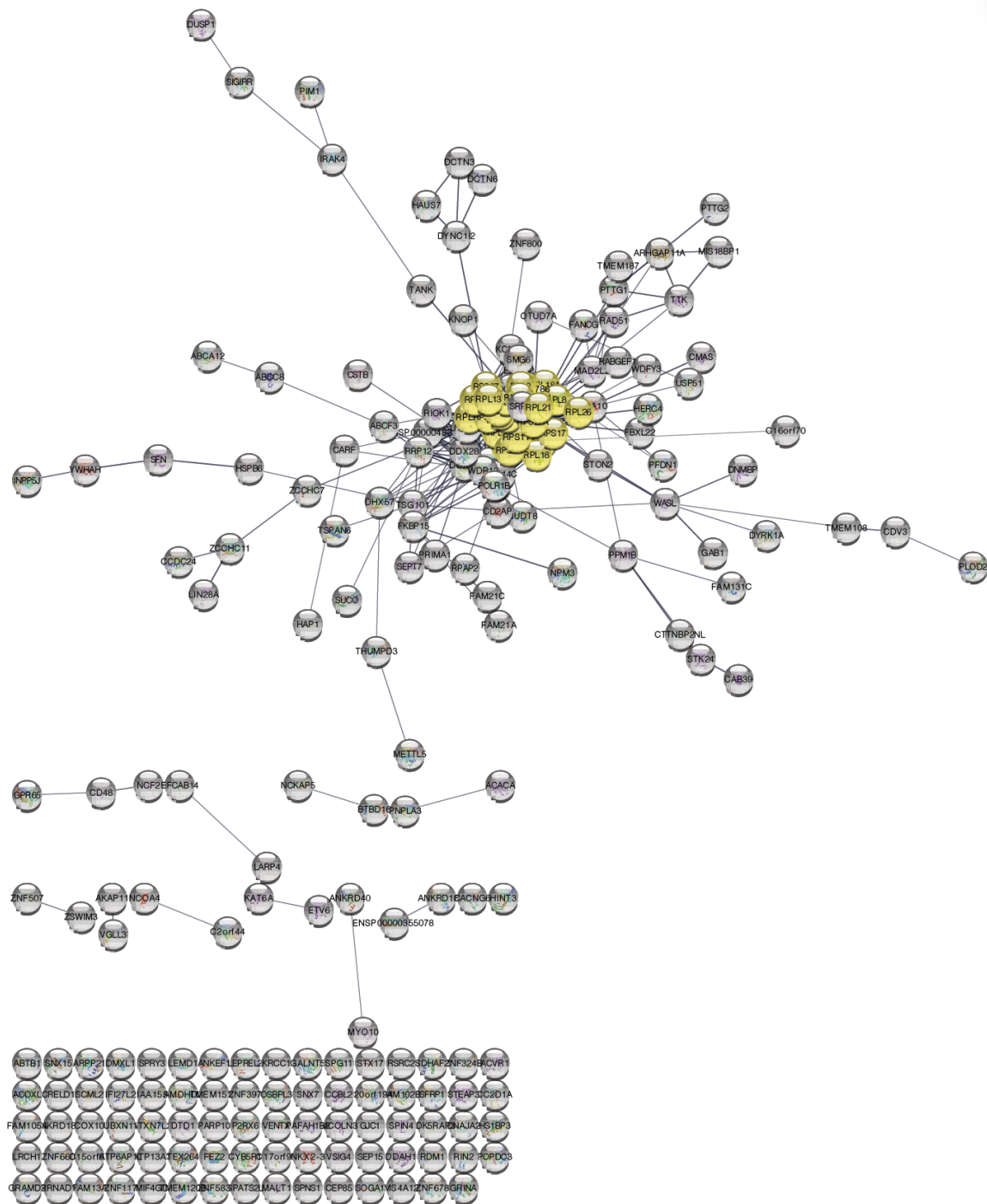
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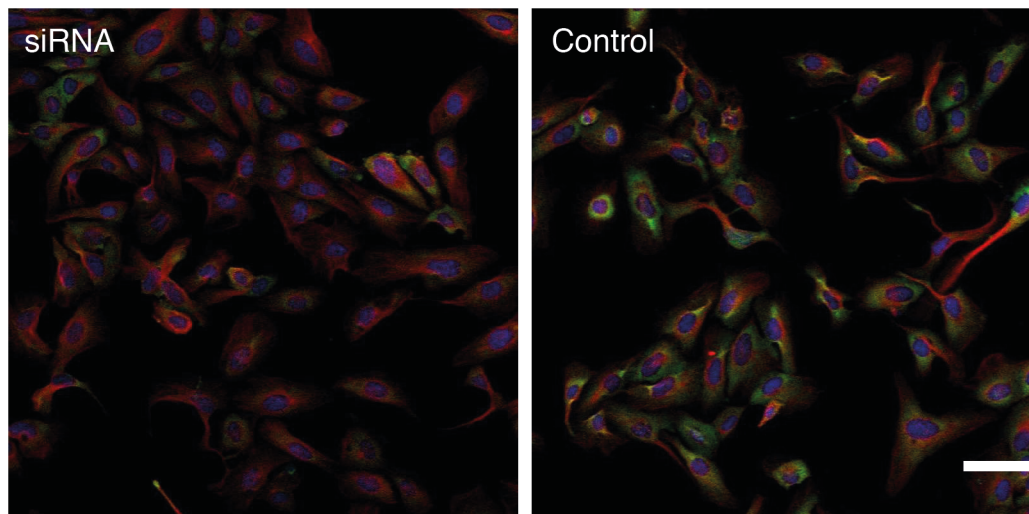
Appendix Figure S1

Immunofluorescent staining of LEO1 in HeLa wild type cells. Protein of interest is shown in green and microtubules in red. Scale bar 10 μm .



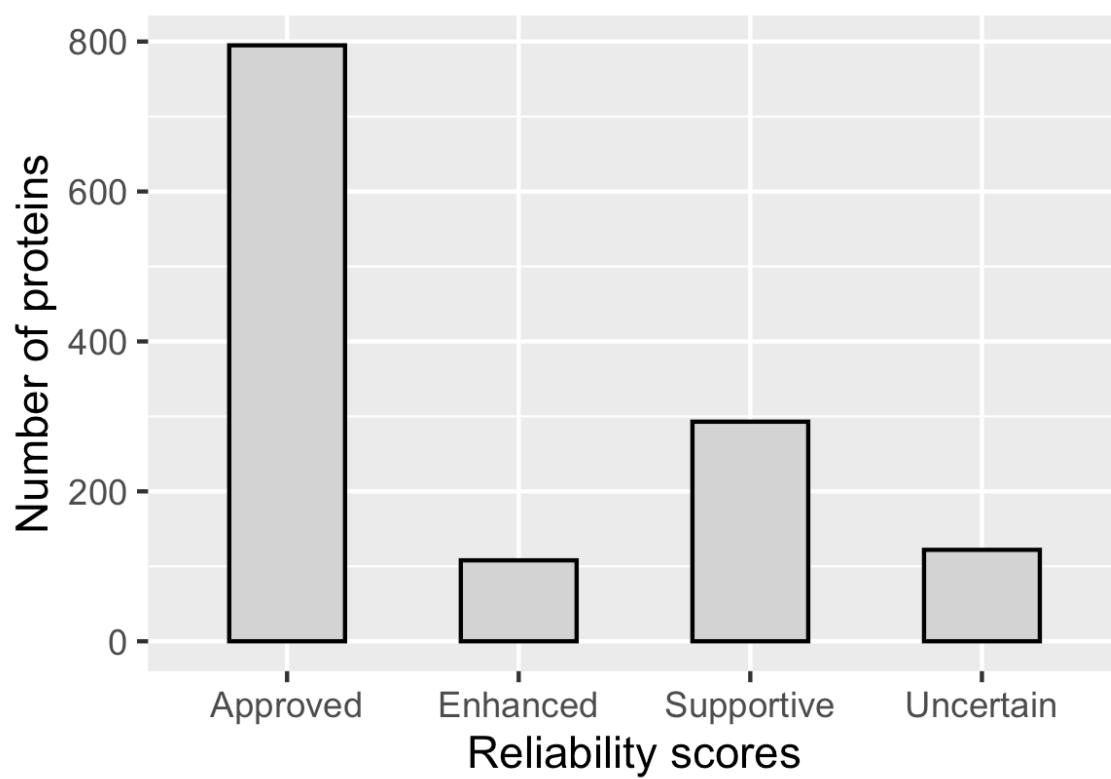
Appendix Figure S2

Protein-protein association network of the shared nucleolar and cytosolic proteome. The yellow highlighted nodes show ribosomal proteins as annotated in Gene Ontology.



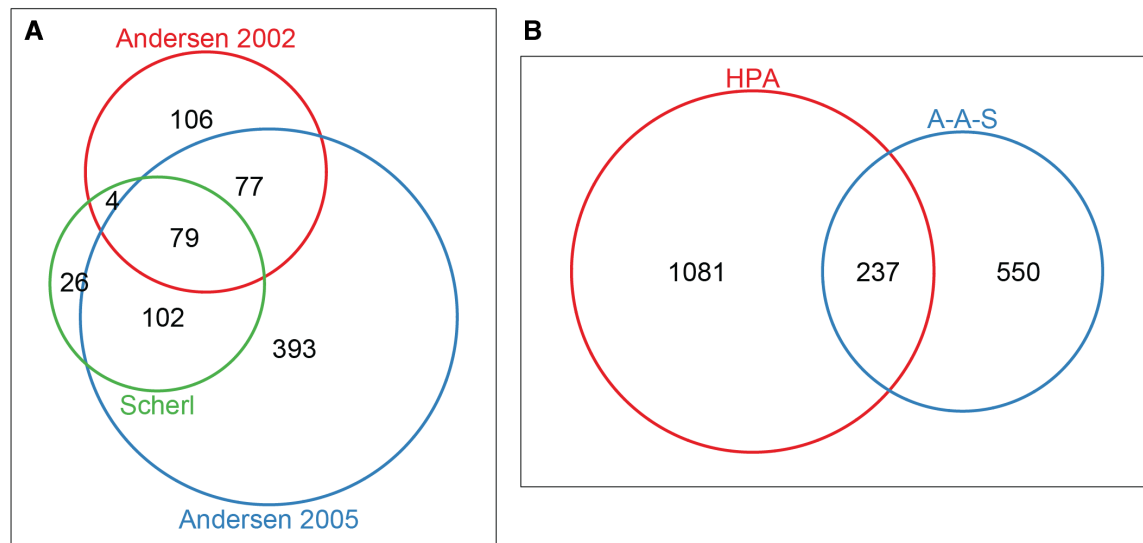
Appendix Figure S3

siRNA antibody validation data for RPL13 (HPA051702). siRNA treated cells to the left, control cells to the right. Protein of interest is shown in green, microtubules in red and DAPI in blue. Scale bar 20 μm .



Appendix Figure S4

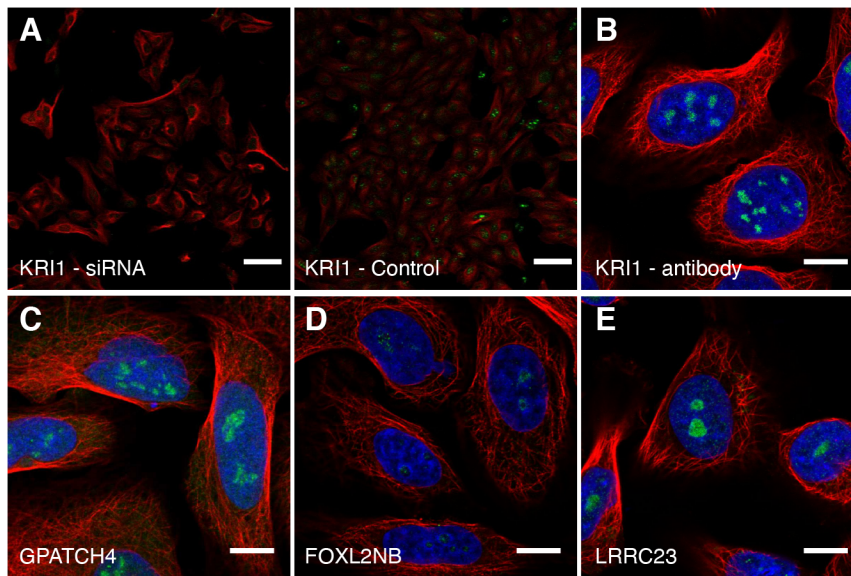
Distribution of the localization reliability scores for the nucleolar proteins in the HPA Cell Atlas (v.19), $n_{\text{approved}} = 795$, $n_{\text{enhanced}} = 108$, $n_{\text{supportive}} = 293$, $n_{\text{uncertain}} = 122$.



Appendix Figure S5

A. Overlap between the nucleolar proteins detected in Scherl *et al.* 2002, Andersen *et al.* 2002 and Andersen *et al.* 2005.

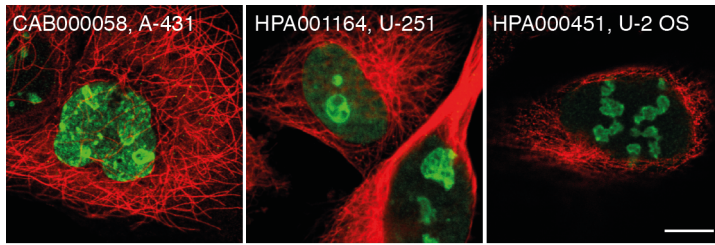
B. Overlap between the merged dataset from the studies mentioned above (A-A-S) and the nucleolar proteins in the HPA Cell Atlas (v19).



Appendix Figure S6

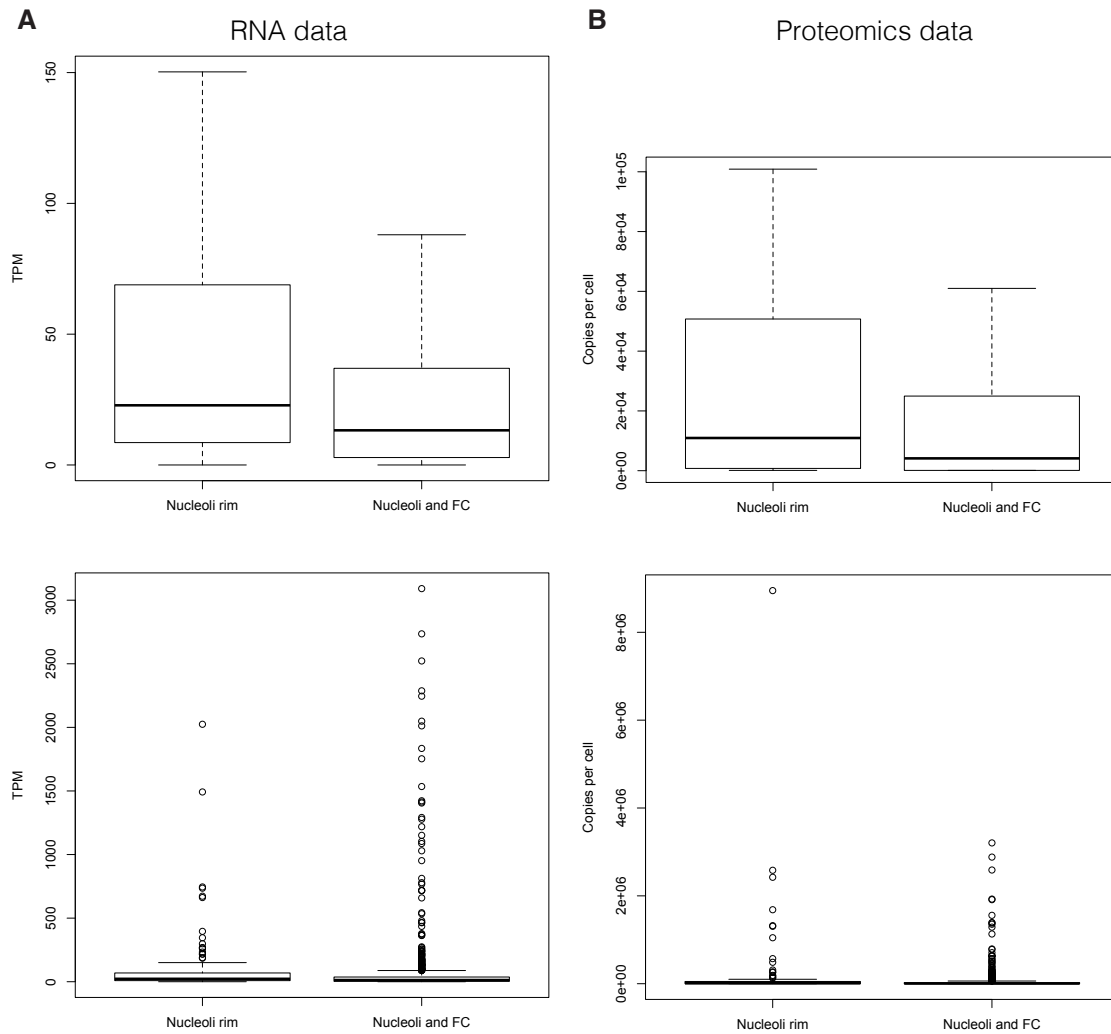
A. siRNA antibody validation data for KRI1 (HPA043574). siRNA treated cells to the left, control cells to the right. Scale bar 20 μm .

IF stainings of B. KRI1 (HPA043110), C. GPATCH4 (HPA028323), D. FOXL2NB (HPA071790) and E. LRRC23 (HPA037766) using antibodies targeting different epitopes of the protein, showing the same localization pattern as the original antibody. Protein of interest is shown in green, microtubules in red and DAPI in blue. Scale bar 10 μm .



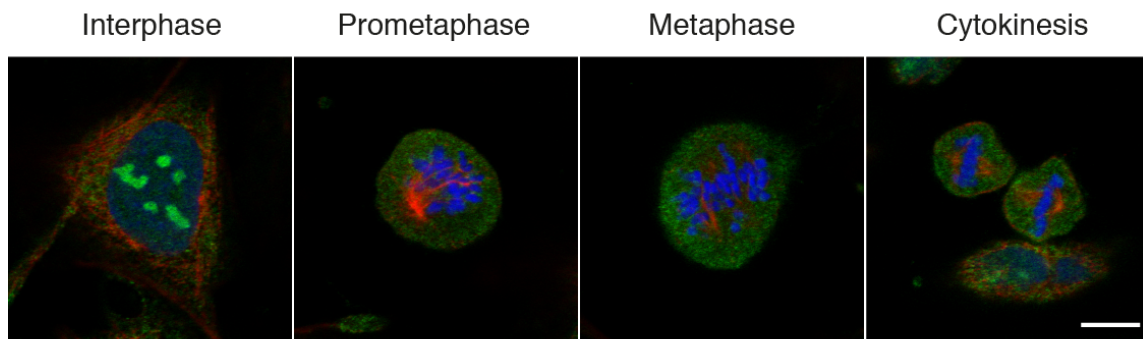
Appendix Figure S7

IF stainings of MKI67 using three antibodies targeting different epitopes of the protein. All showing the characteristic nucleoli rim staining pattern. Protein of interest is shown in green and microtubules in red. Scale bar 10 μ m.



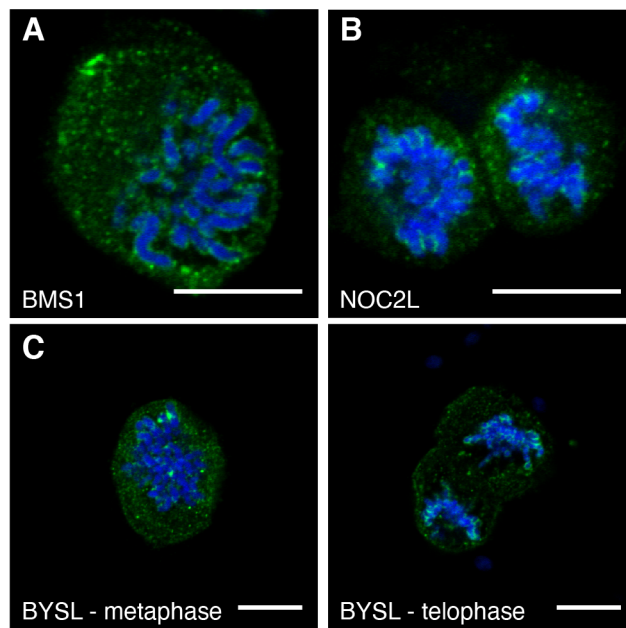
Appendix Figure S8

A. U-2 OS RNA expression data (TPM) and B. proteomics data (Copies per cell) from Beck *et al.*, 2011 for the nucleoli rim proteins compared to all other nucleolar proteins. In the proteomics dataset, 96 of 157 (61%) nucleoli rim proteins and 613 of 1,161 (53%) non-rim nucleolar proteins were detected. The upper box plots show the distribution of quartile one to four, while the lower box plots show the distribution of all genes/proteins in the dataset.



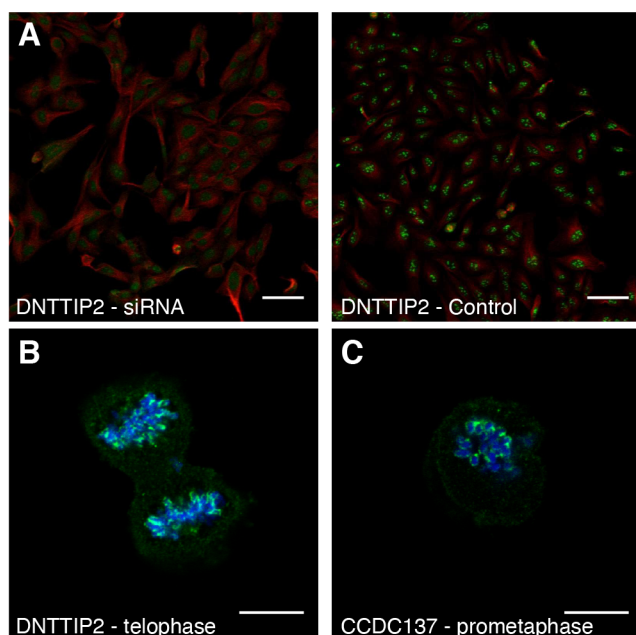
Appendix Figure S9

85 of 150 nucleolar proteins did not localize to mitotic chromosomes. Here exemplified by RPS19BP1 (HPA042874). Protein is shown in green, DAPI and blue and microtubules in red. Scale bar 10 μ m.



Appendix Figure S10

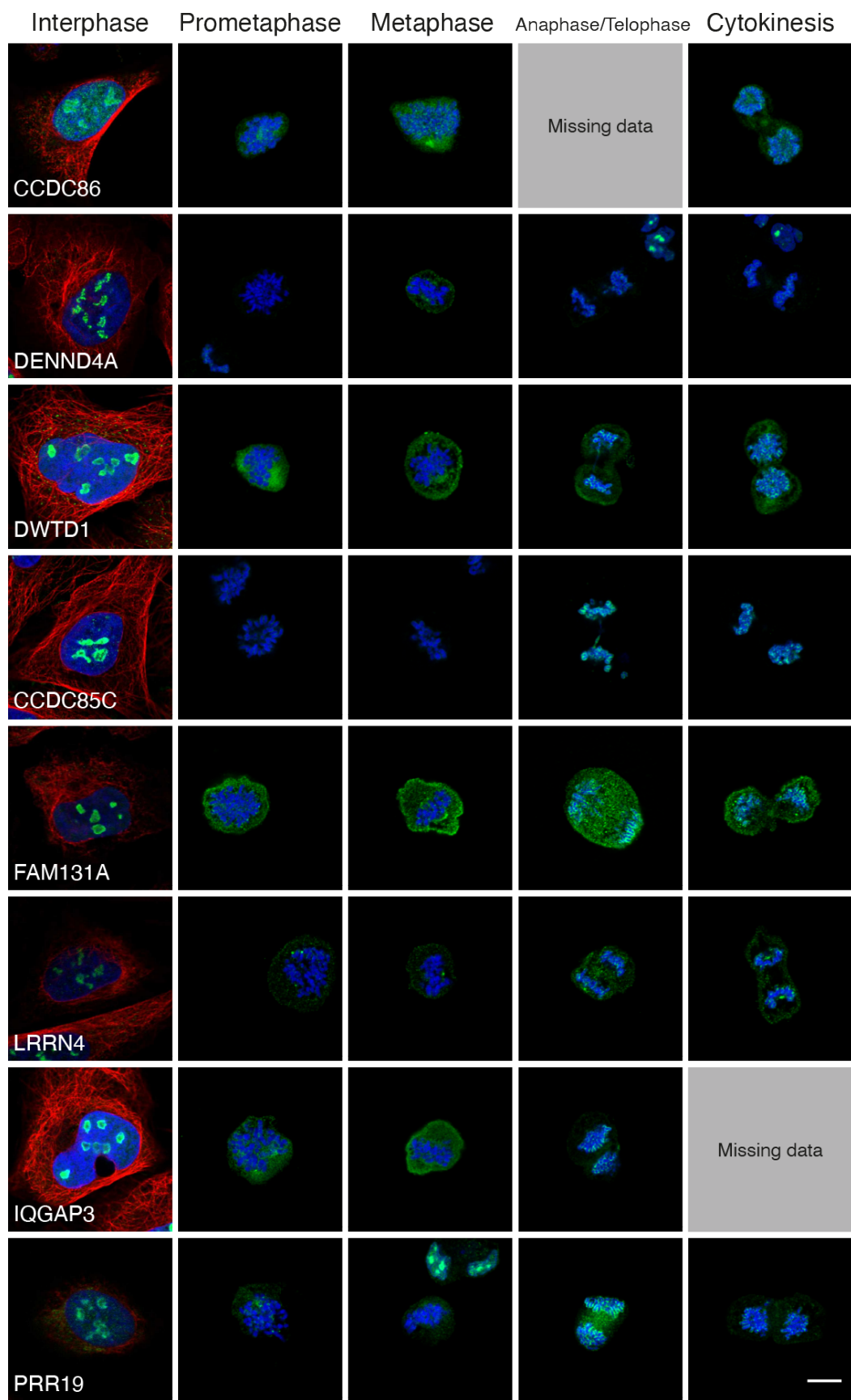
IF stainings of A. BMS1 (HPA036589), B. NOC2L (HPA062195) and C. BYSL (HPA031217) in mitosis using antibodies targeting different epitopes of the protein, showing the same localization on mitotic chromosomes as the original antibody. Protein of interest is shown in green and DAPI in blue. Scale bar 10 μm.

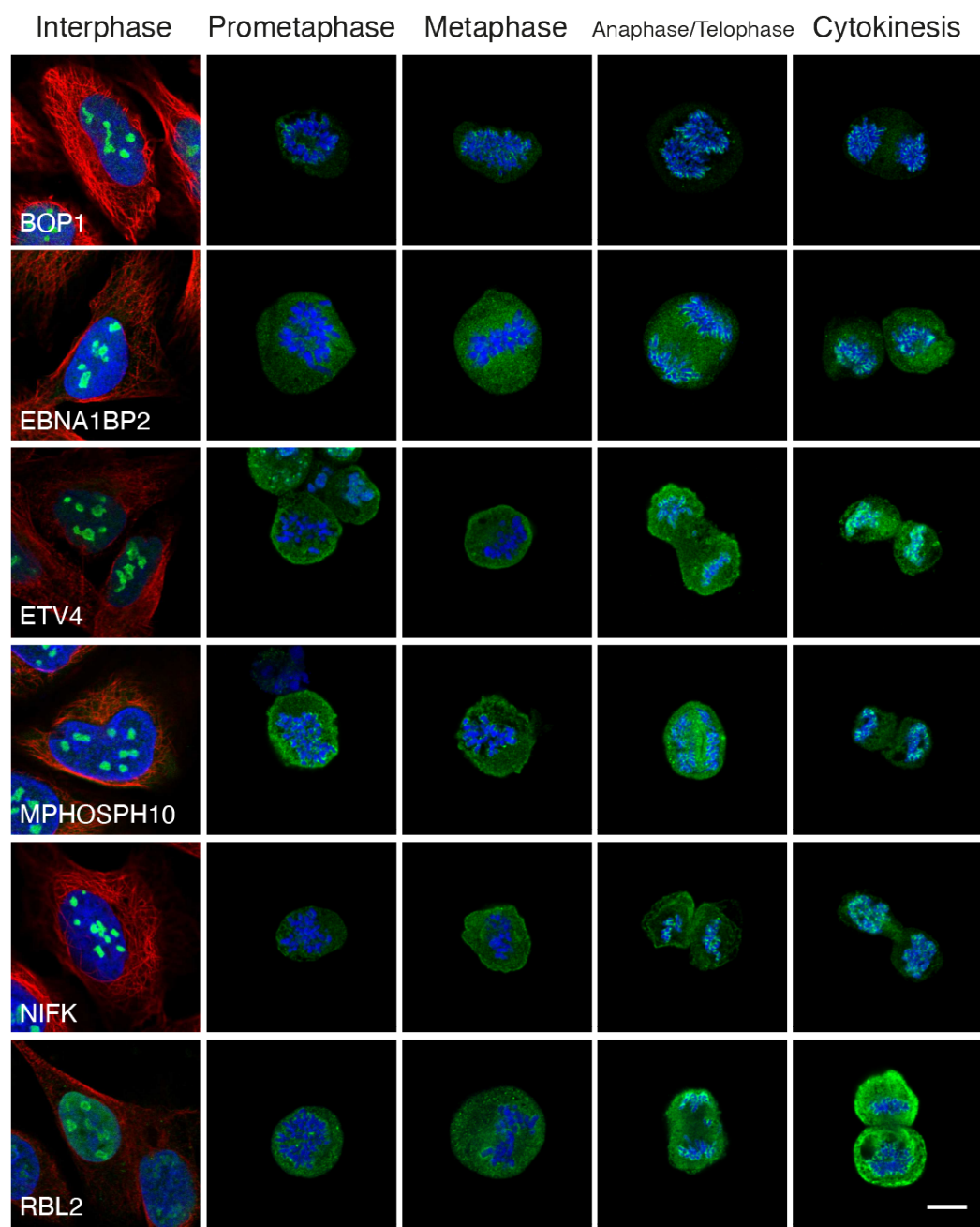


Appendix Figure S11

A. siRNA antibody validation data for DNTTIP2 (HPA044502). siRNA treated cells to the left, control cells to the right. Scale bar 20 μ m.

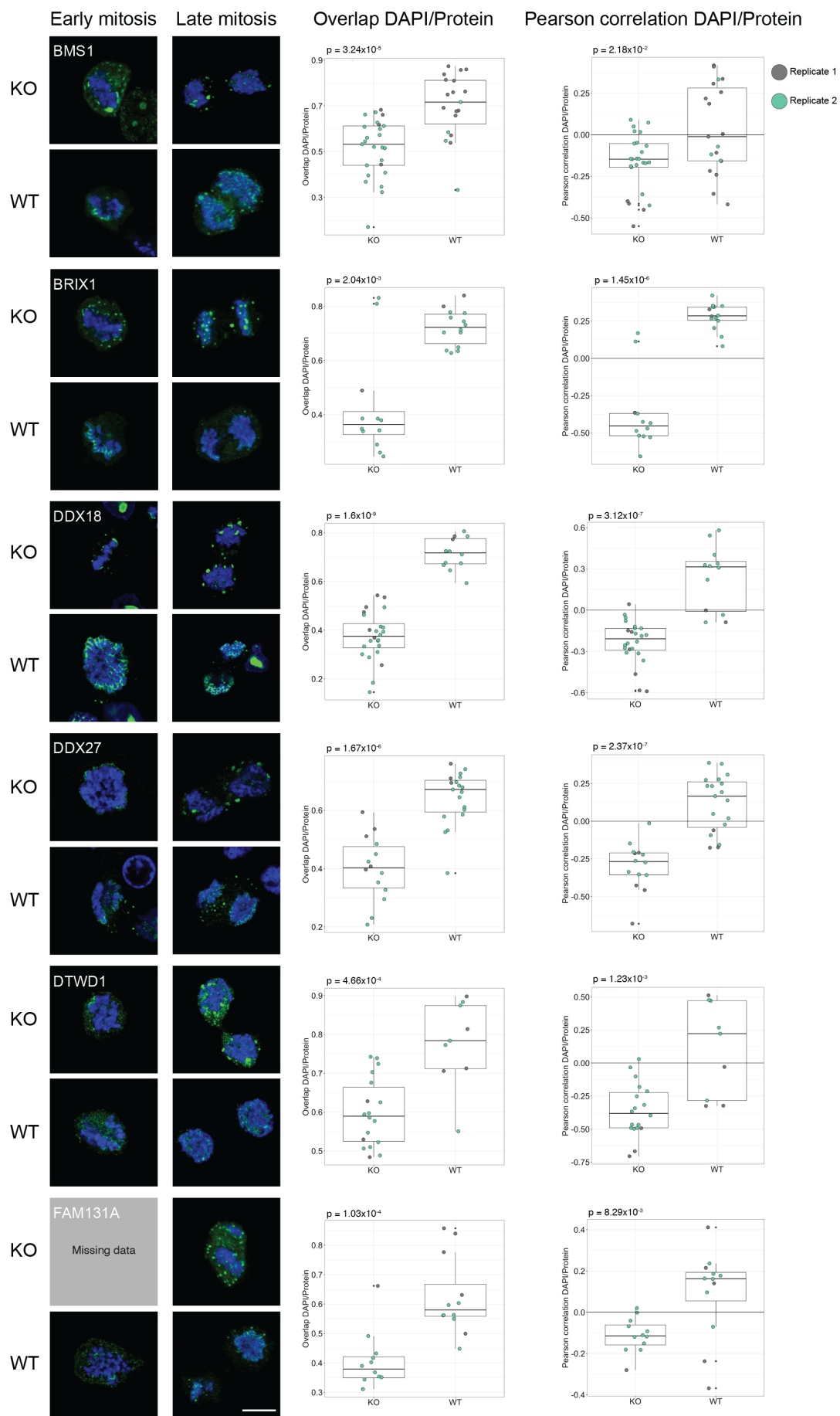
IF stainings of B. DNTTIP2 (HPA044502) and C. CCDC137 (HPA053914) in mitotic cells showing localization to mitotic chromosomes. Protein of interest is shown in green and DAPI in blue. Scale bar 10 μ m.

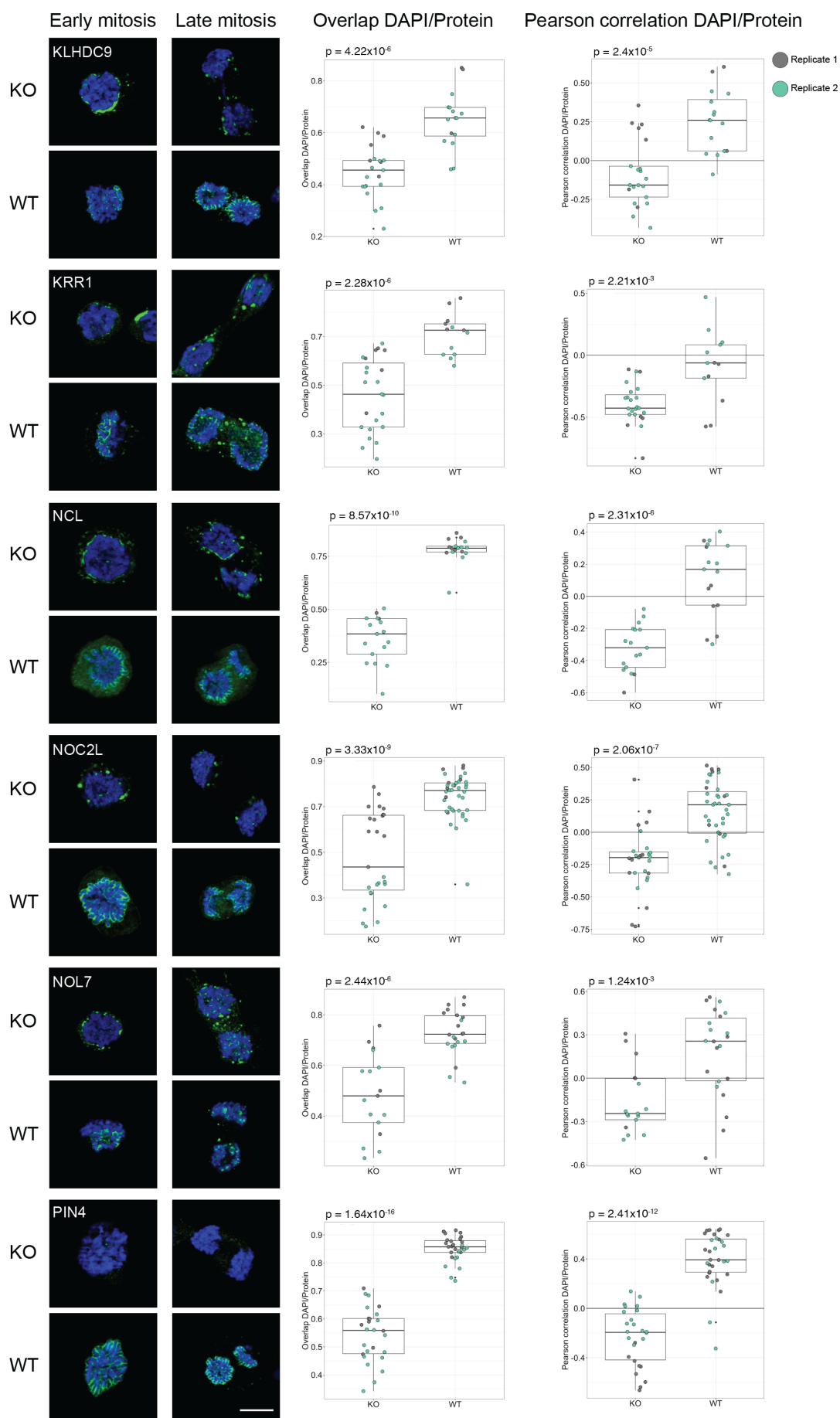


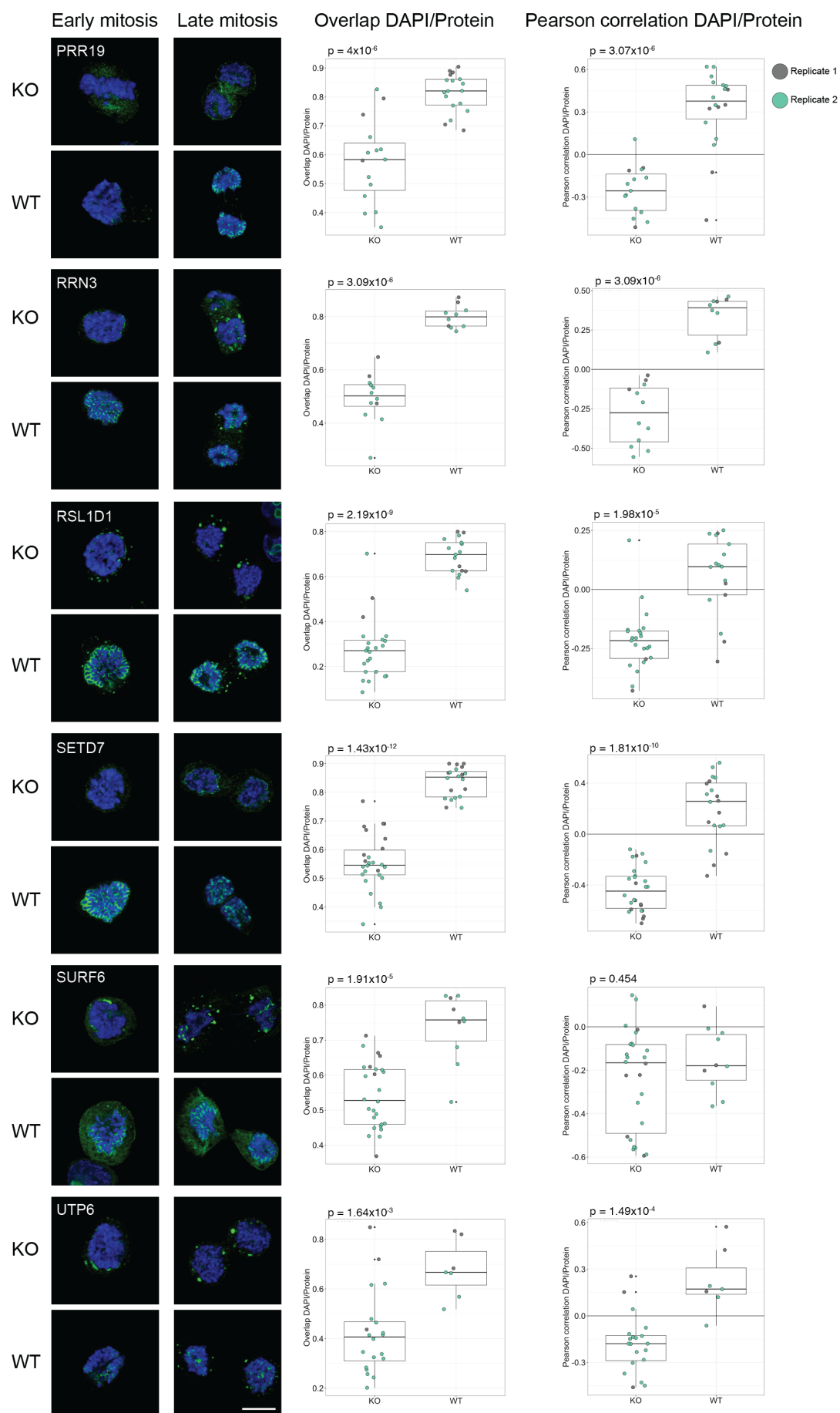


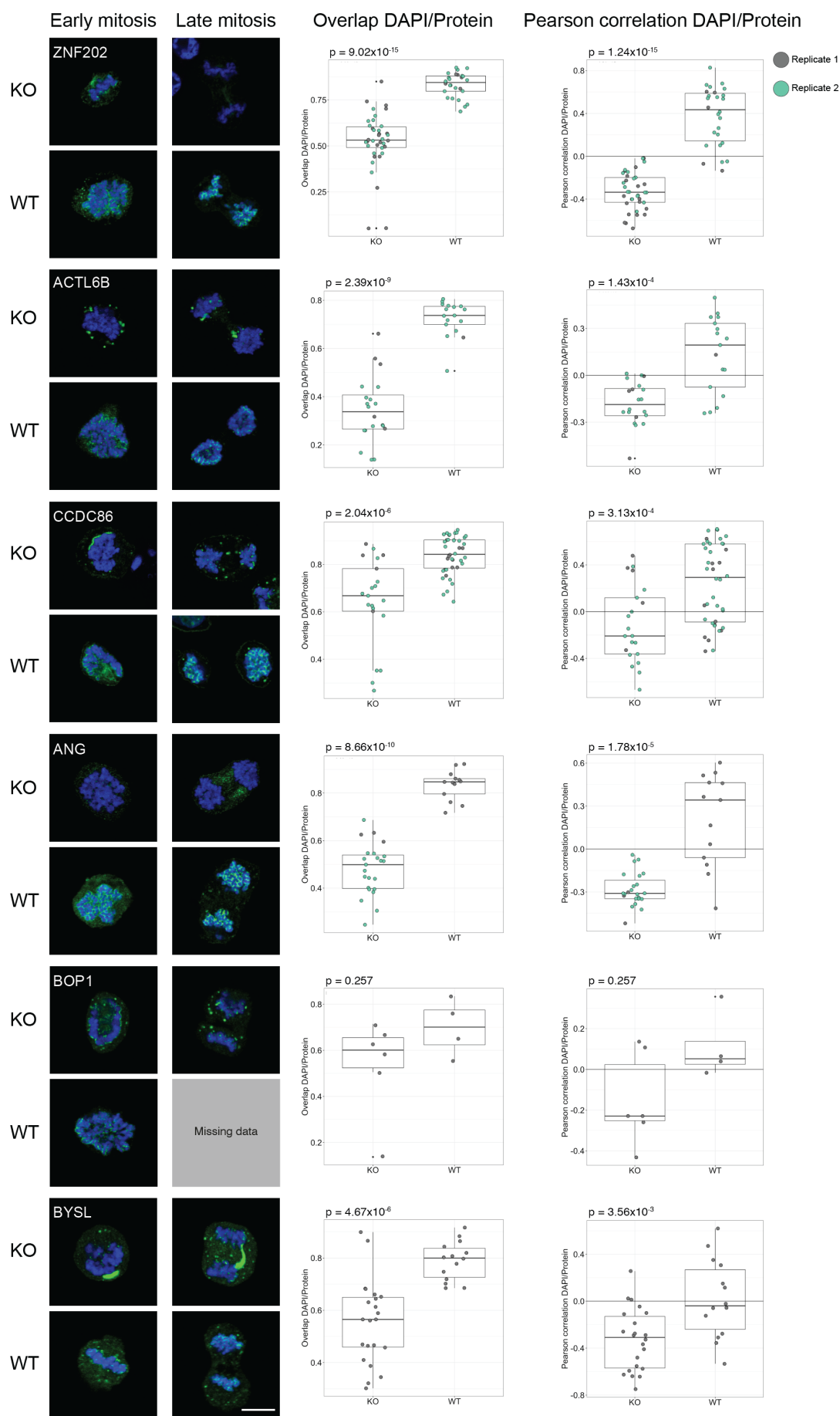
Appendix Figure S12

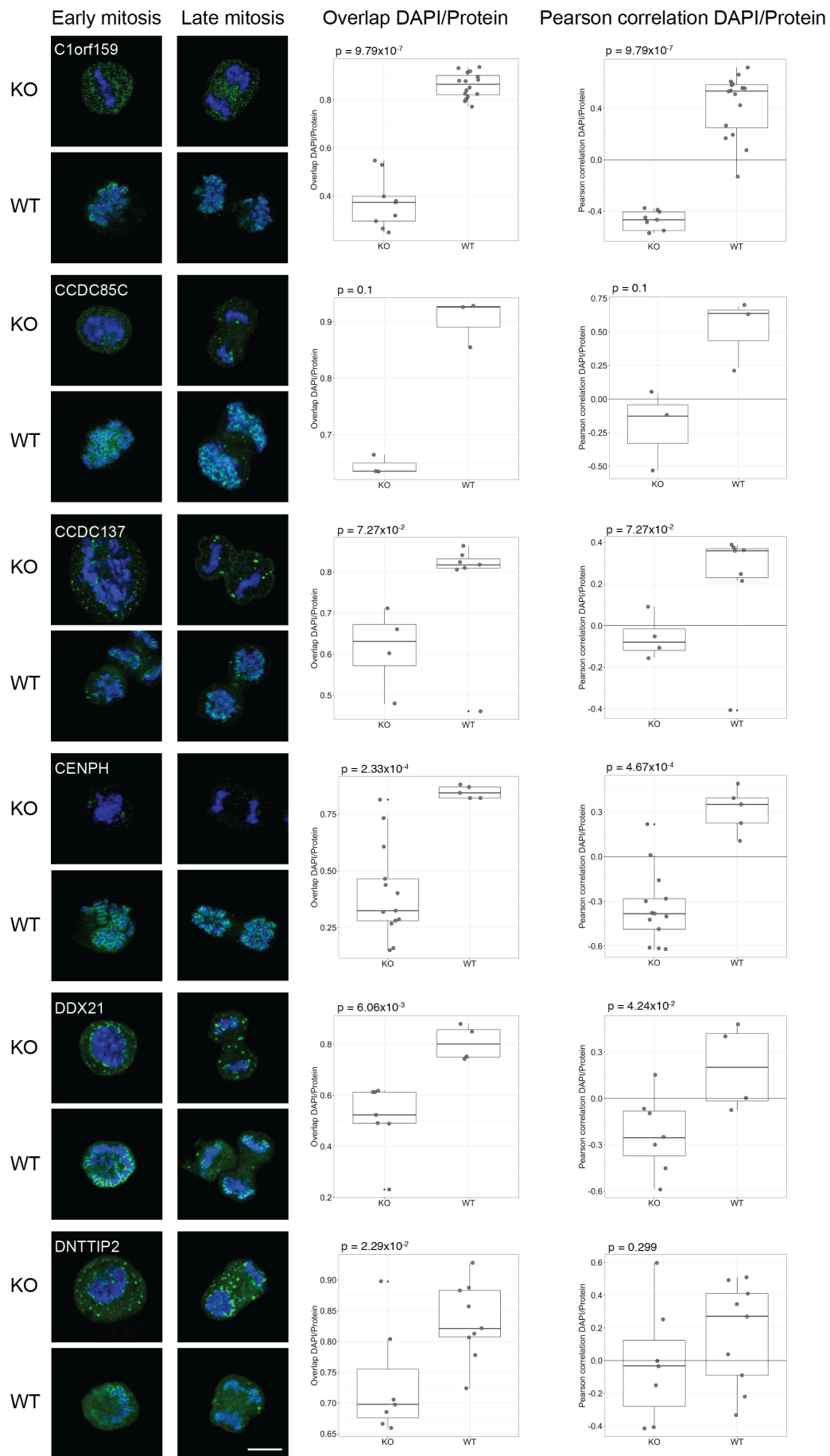
IF stainings of the proteins showing late recruitment to mitotic chromosomes. Protein of interest is shown in green, microtubules in red and DAPI in blue. Images of interphase cells were acquired from a different experiment and staining intensities cannot be compared between interphase and mitotic cells. For antibodies used, see Dataset EV3. Scale bar 10 μ m.

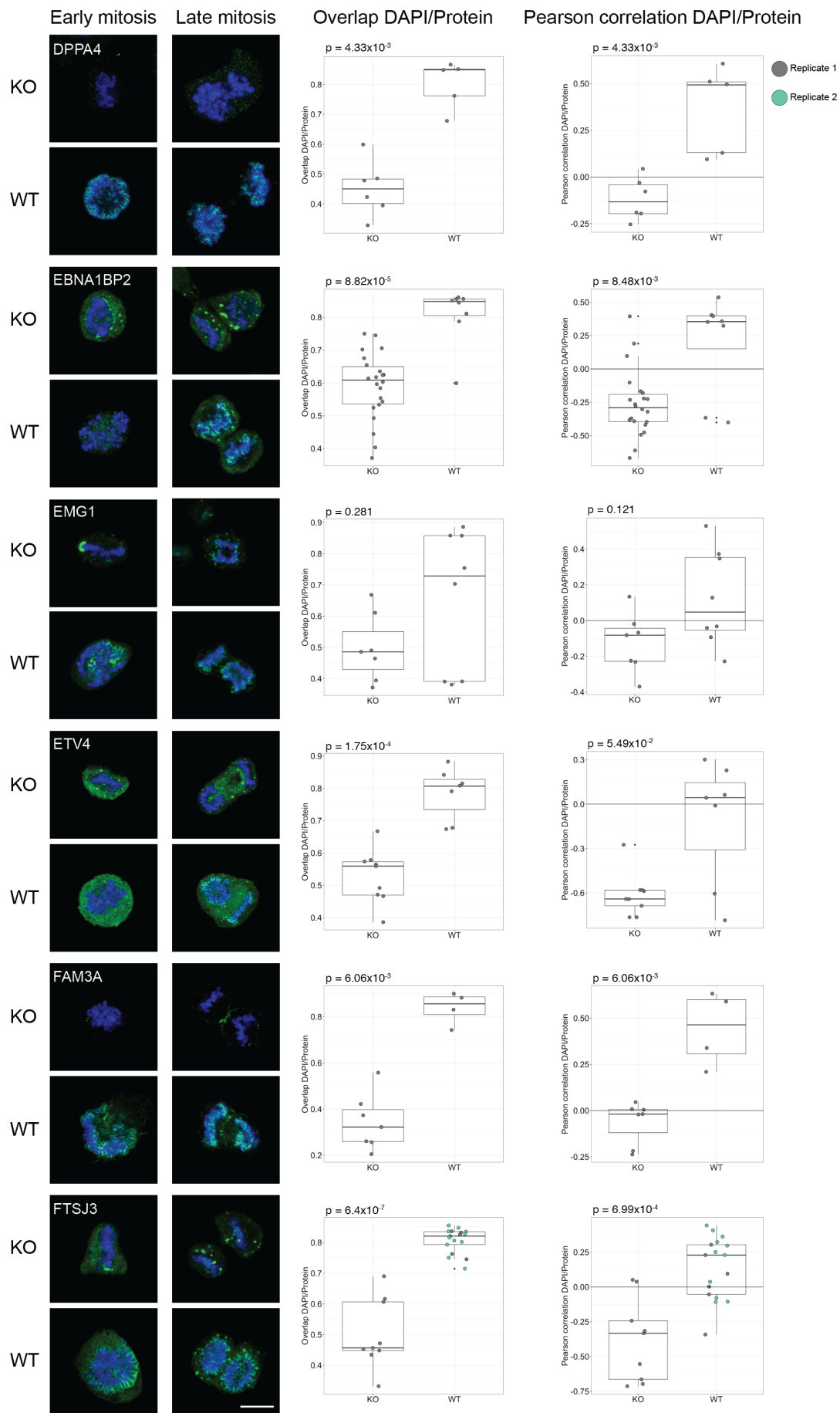


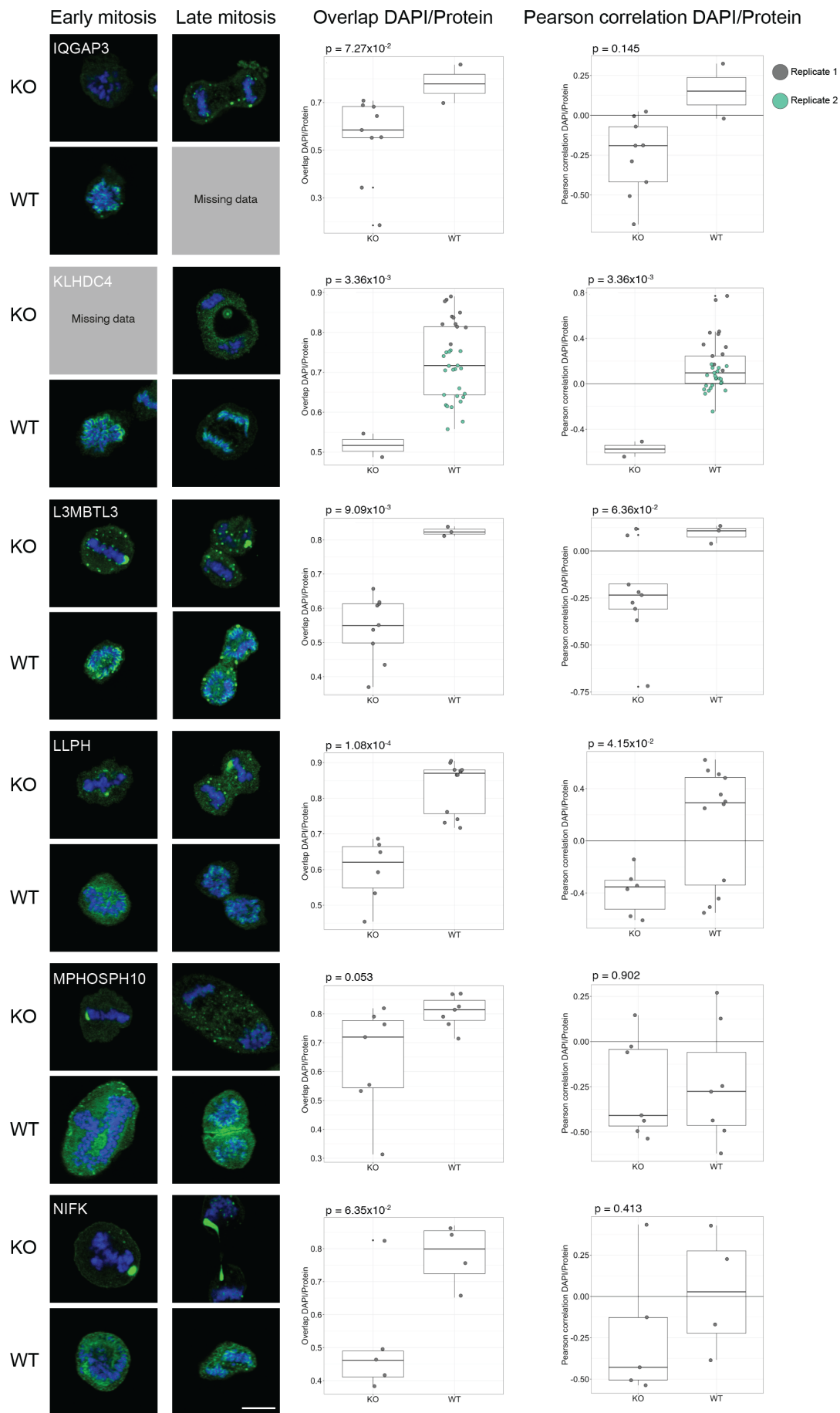


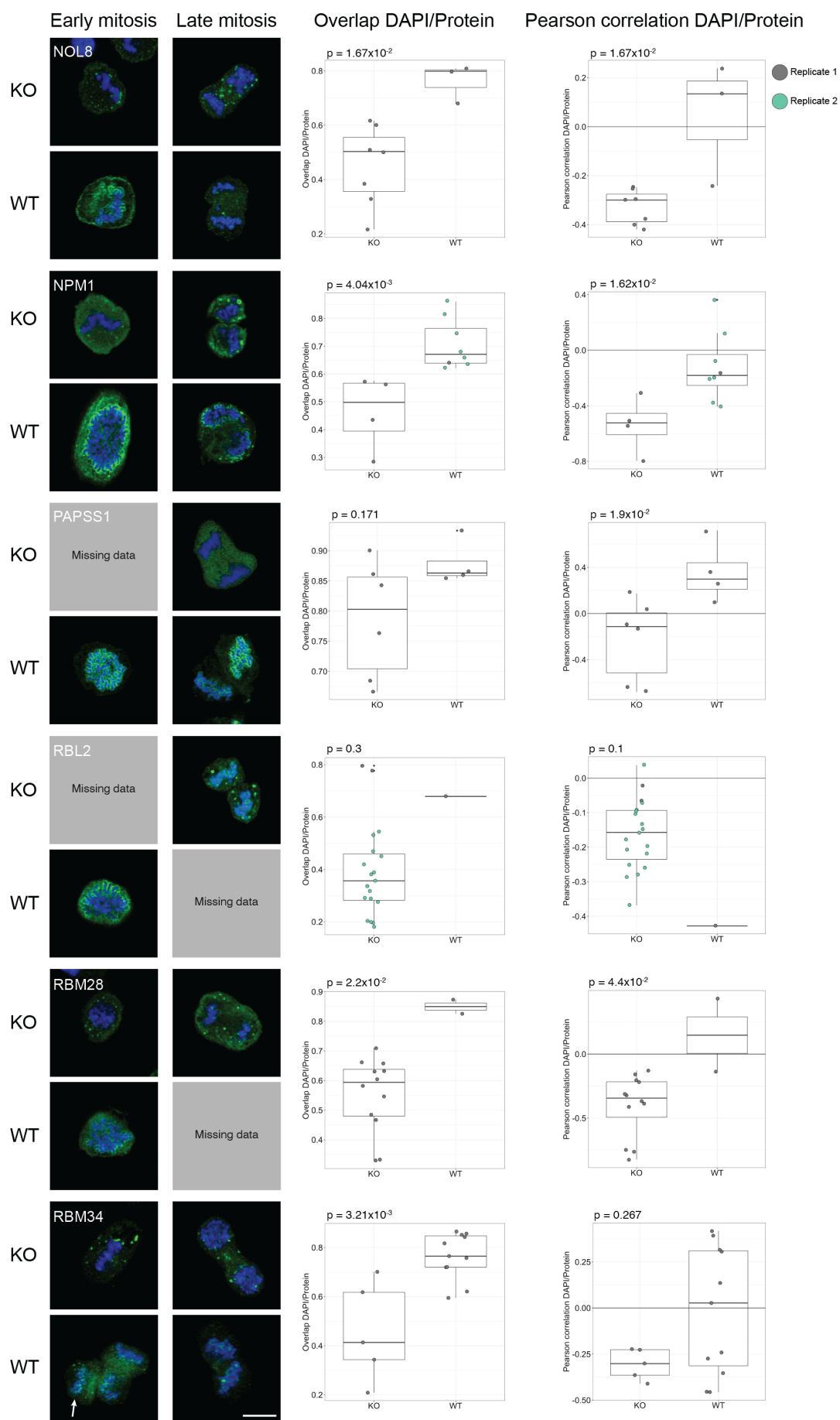


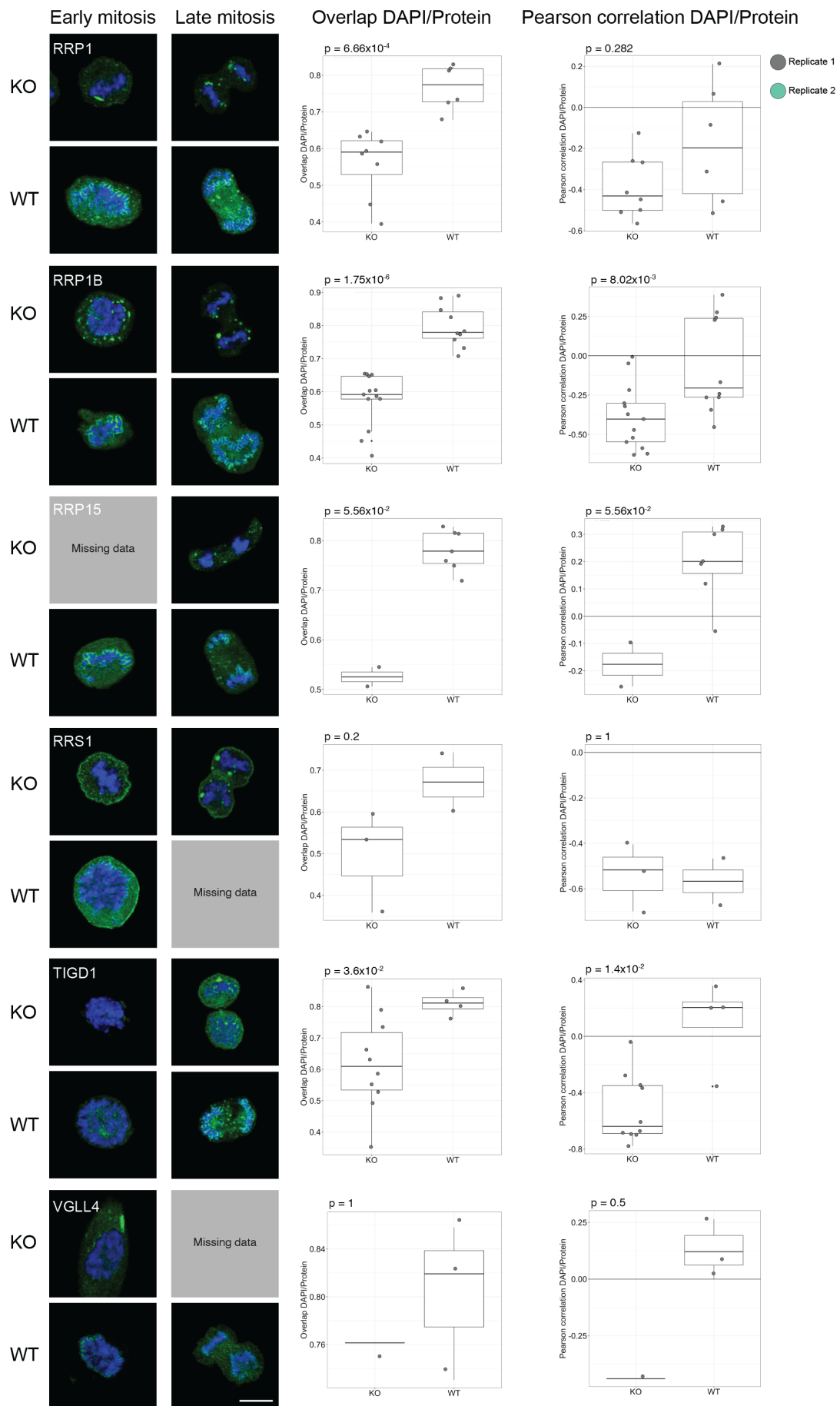












Appendix Figure S13

IF stainings of the mitotic chromosome proteins in WT HeLa and MKI67 KO HeLa cells. Protein is shown in green and DAPI in blue. For antibodies used, see Dataset EV3. Scale bar 10 μm . Box plots show measured overlap and Pearson correlation between the DAPI and protein staining (replicate 1 in grey and replicate 2 in green). A two-sided unpaired Wilcoxon test was applied to calculate the statistical significance between the phenotypes and the output p-value is stated in each plot.