



Figure 9. Nuclear organization in *S. pombe*. (A) Electron microscopy analysis of an *S. pombe* nucleus. (Top) Micrograph of a cross-section through a high-pressure fixed and Lowicryl-embedded interphase *S. pombe* cell. The cellular structures are indicated: cell wall, nuclear envelope, nucleolus, heterochromatin region, and SPB. (Bottom) A higher magnification of the same nucleus. The nuclear structures indicated are SPB, γ -tubulin region, anchor structure, and the centromeric heterochromatin. (B) Two interphase nuclei with heterochromatin (centromeres, telomeres, and the silent *mat2-mat3* loci) decorated by red fluorescent immunolocalization of Swi6, and kinetochore chromatin (centromeres only) decorated by green fluorescent immunolocalization of CENP-A^{Cnp1}. The red signals, not in close proximity to green, represent telomeres or the *mat2-mat3* loci. All centromeres are clustered at the nuclear periphery adjacent to the SPB. (C) A model for chromatin organization at the fission yeast nuclear periphery. (Top) Genes with low expression levels tend to associate with the nuclear periphery, whereas highly expressed genes tend to reside in the nuclear interior. (Top) Localization of divergent intergenic regions and H2A.Z at the nuclear envelope may present a mechanism for anchoring the promoters of convergent gene pairs at the periphery. (Bottom left) Differential localization of *Ima1*, nuclear pores, and *Man1*. The inner membrane proteins *Ima1* and *Man1* are not equally distributed at the nuclear periphery, but rather occupy distinct areas that interact with different chromosomal regions. The subtelomeric chromatin is associated with *Man1*-rich peripheral regions in which Swi6 is also located. *Ima1* is colocalized with *Dcr1* and *Rdp1* at nuclear pores. (Bottom right) Organization of centromeric DNA at the SPB. Central domain *cnt* and *imr* regions are localized closer to the SPB than the heterochromatic *dg* and *dh* repeats. The two centromeric domains are shaded in colors symbolizing the different IF localization of Swi6 (*dg-dh* repeats) and CENP-A^{Cnp1} (*imr/cnt* regions). (A, Reprinted from Kniola et al. 2001; C, bottom right, Adapted from Takahashi et al. 1992.)