

CORRECTION

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Correction: From chromosomal protein disorder to chromatin phase separation

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In this article Figs. 1, 2 and 3 appeared incorrectly with the word “Davie and Ausio 2025” and have now been

corrected in the original publication. For completeness and transparency, the old incorrect and new correct versions (Figs. 1, 2, 3) are displayed in this correction article.

The original article can be found online at <https://doi.org/10.1186/s13072-026-00671-4>.

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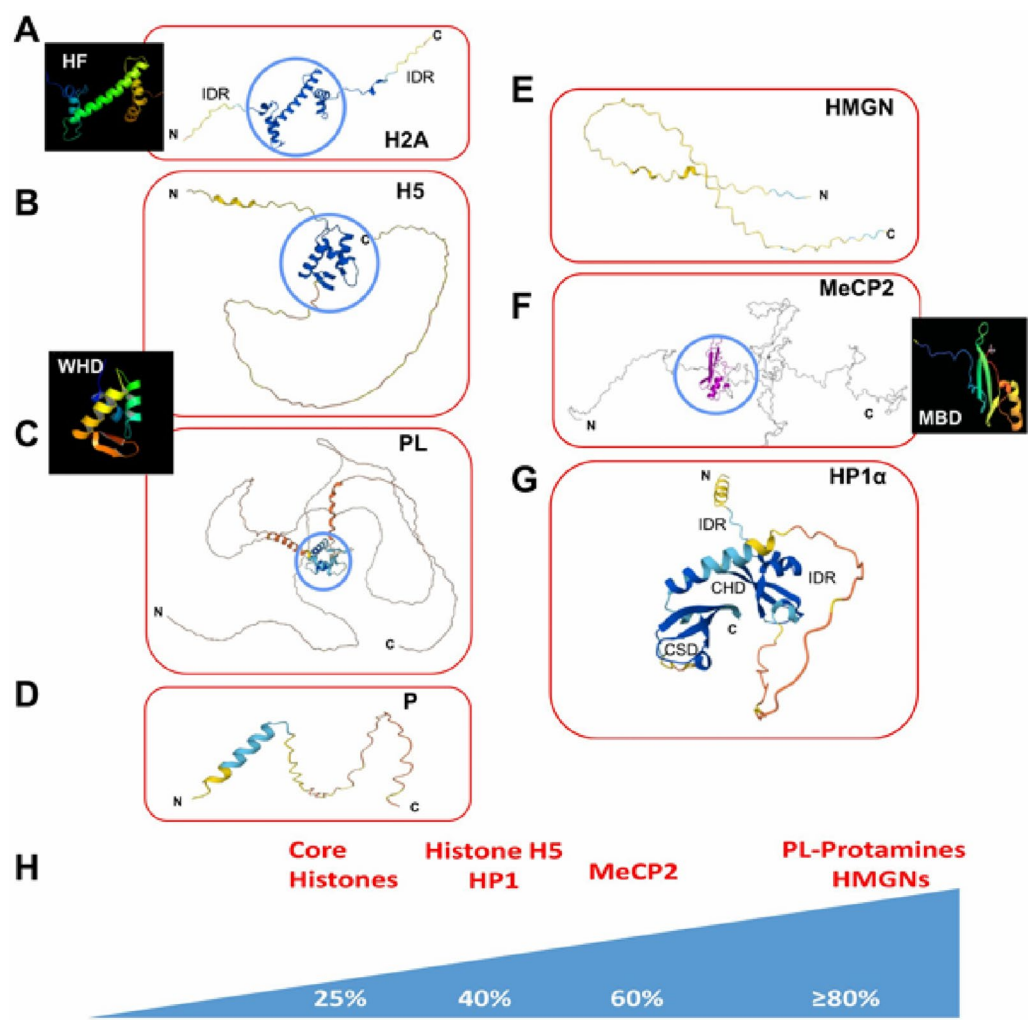
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Incorrect Fig. 1



Correct Fig. 1

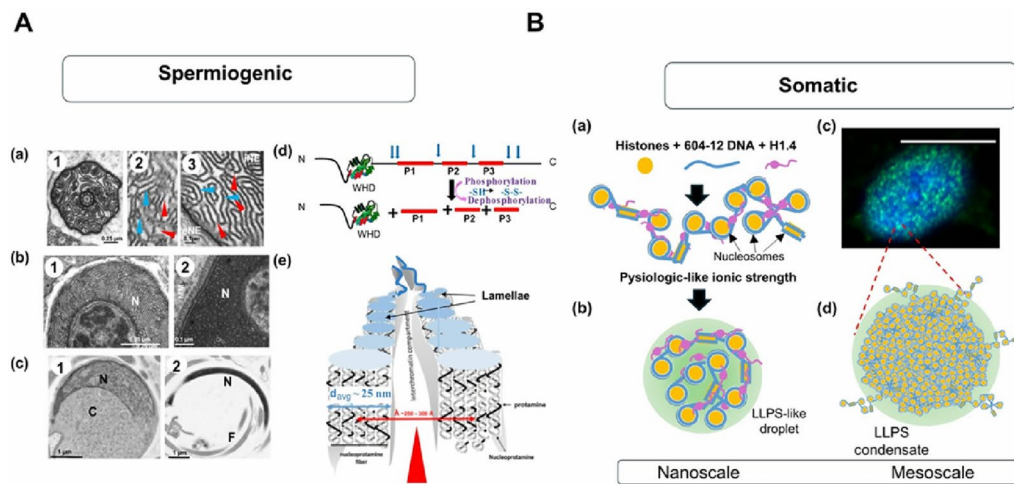
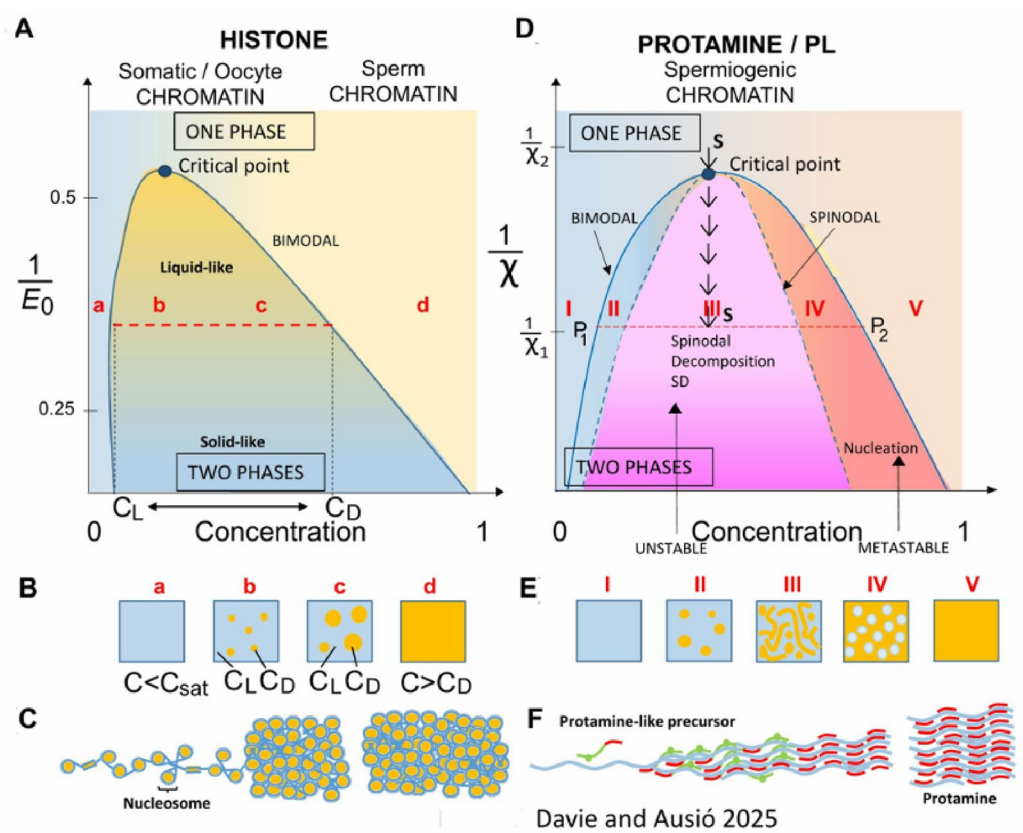


Fig. 3 Occurrence of chromatin LLPS in spermiogenic and somatic cells. **A** Widespread occurrence of chromatin spinodal decomposition during spermiogenesis in several organisms. **a** Transmission electron microscopy (TEM) micrograph of a transverse section of the nucleus of an elongated spermatid of the gastropod *M. brandaris* [1] depicting the lamellar chromatin organization that is characteristic of spinodal decomposition (SD). Also shown are the dynamic disruption and reassembly involved in the process of remodelling of these structures corresponding to an internal region of the nucleus [2] and to the association of the lamellae with the nuclear envelope [3]. The blue and red arrowheads point to the lamella and to the interchromatin compartment respectively. eNE: external nuclear envelope; iNE internal nuclear envelope. **b** TEM of cross sections of late spermatids from the spider *Steatoda grossa* at different stages of chromatin condensation undergoing SD [1] and nucleation [2]. N, nucleus. **c** Electron micrographs of a condensing spermatid of *M. polymorpha* showing chromatin undergoing SD [1] and of a mature sperm cell [2] with highly condensed coiled nucleus (N) and flagellae (F). **d** Schematic representation of the protein processing from a PL precursor (pLP) into the final protamine P1-P3 during spermiogenesis. The (blue) arrows symbolize the cleavage sites. Other post-translational modifications such as phosphorylation and cysteine oxidation are also indicated. WHD: winged helix domain. **e** Schematic cartoon representation of the dynamic lamellae seen in 3 A (a-c). The red arrowhead corresponds to the same arrowheads shown in (a) 2–3. **B** Phase separation of somatic chromatin in vitro and in vivo. **a** Chromatin reconstitution approach to reconstitute chromatin templates used in the in vitro analyses of LLPS/SLPS in solutions consisting of chemically defined environments. **b** Under these experimental conditions the reconstituted chromatin oligomers undergo SLPS/LLPS forming droplets as a result. **c** Immunofluorescence image of a nucleus from ReNCell neuronal cell line showing a characteristic punctuate pattern corresponding to chromatin condensates containing histone H1.4. DNA shown as a blue DAPI stain and the error bar is 10 μm . **d** Schematic representation of the corresponding chromatin condensate

Incorrect Fig. 2



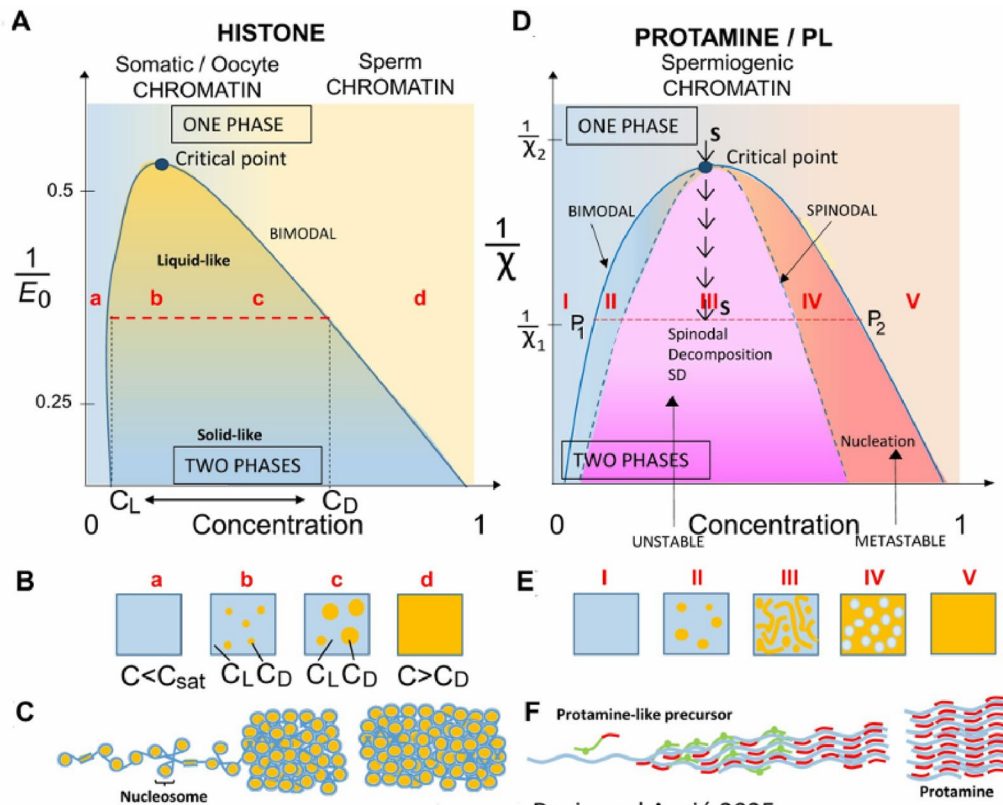
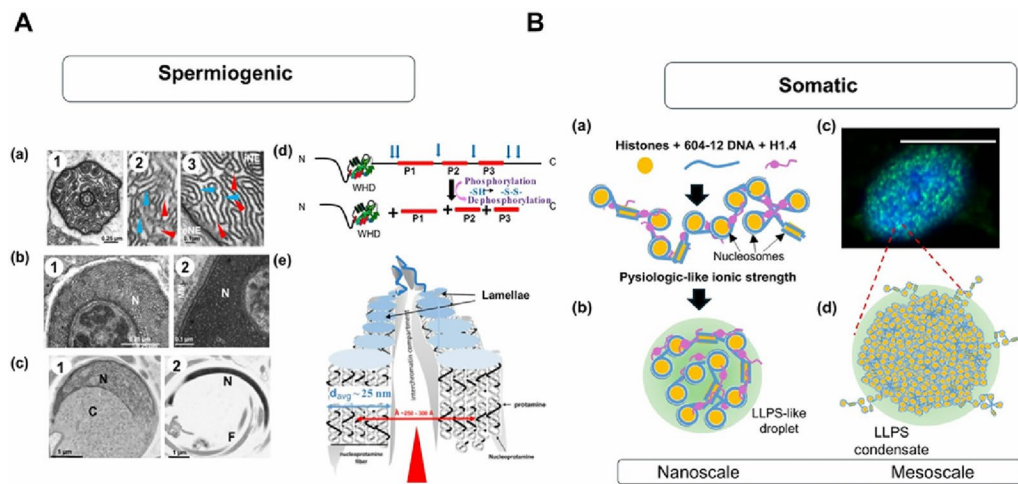
Incorrect Fig. 2

Fig. 2 Sketch of phase diagrams for somatic and sperm chromatin. **A** Schematic diagram for the liquid-liquid and the solid-like phase separation (LLPS/SLPS) of nucleosome organized chromatin. The bimodal line (blue) separates the one phase and two phases domains as a function of the nucleosome binding energy E_0 (see text for more details). No phase separation takes place beyond the critical point. Within the two phases regime, at a critical high E_0 , a transition takes place from a liquid-liquid to a solid like phase separation of chromatin (see text). **B** At any different condition E_0 within the two-phases region on a single tie line (for instance on the red dotted line shown in (A)) the system disperses into light and dense phases of concentrations C_L and C_D with only their volume changing relatively to each other (a – d). **(C)** Molecular model of the chromatin condensation in the a to d transition shown in (A-B). Yellow color: Chromatin (nucleosomes); light blue background: interchromatin compartment. C_{sat} is the concentration above which the phase separation starts to take place. **D** Sketch for the LLPS of protamine/ protamine like (PL) spermiogenic chromatin. As in (A), the bimodal blue line separates the phase domains but as a function of the interaction parameter χ (chi). The spinodal (dashed blue line) encompasses the unstable region of instability where the system separates into two phases by spinodal decomposition (SD). A system at composition S above the phase separation curve at $1/\chi_1$ exists as one phase. However, if suddenly brought to $1/\chi_2$ (depicted by the sequential little arrows) it will split into two phases of compositions P_1 and P_2 . In the area (in orange color) between the bimodal and spinodal line to the right, the system de-mixes by nucleation in a metastable state. **E** and **F** same as in (B-C). A protamine PL precursor is shown as a green-red molecule to be processed into a protamine (red) during spermiogenesis

Incorrect Fig. 3



Correct Fig. 3

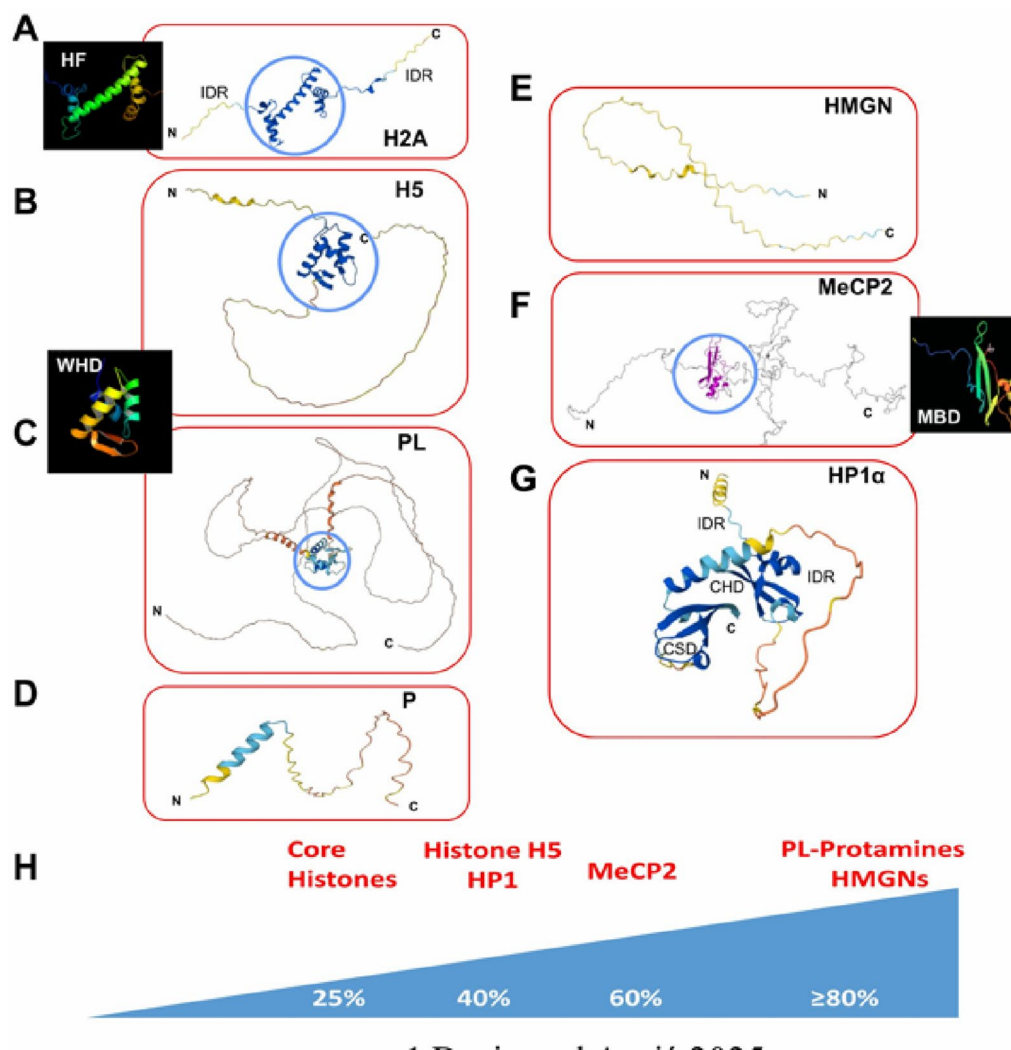


Fig. 1 Intrinsic disorder of chromatin proteins. A core histone H2A, B chicken erythrocyte linker histone H5, C protamine-like (PL) protein from the surf clam *S. solidissima*, D Loligo opalescens squid protamine (P), E human HMGN1, F human MeCP2, G human HP1α. The three-dimensional organization of the winged helix domain (WHD), histone fold (HF), methyl binding domain (MBD), chromodomain CHD) and chromoshadow domain (CSD) are also shown. The images A-D and E and G were produced with the help of AlphaFold Protein Structure Database (see list of is references) and the image in F was obtained using a combination of all-atom and coarse-grained simulations. H Graphic representation of the extent of protein disorder. IDR: intrinsically disordered region; C: C-termini and N: N-termini

The original article has been corrected.
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