Figure 1. Organelles scale with cell cytoplasm.

(A) Sketches of red blood cells taken from various vertebrate species by George Gulliver (1875) highlighting the scaling of nucleus to cell size. Reproduced with permission from [80]. (B) Sketch of two centrifuged Crepidula two-cell embryos by E.G. Conklin (1912). Due to centrifugation along the indicated axis (arrows) during cleavage, cell size and the amount of cytoplasm (dotted) and yolk (brown) are not proportional in the two blastomeres. The size of spindles (green), nuclei (purple), and centrosomes or 'spheres' (yellow) depend on the volume of cytoplasm in which they find themselves rather than the physical dimensions of the cell. Adapted with permission from [1]. Note that the organelles do not scale in strict proportion to cytoplasmic volume, possibly reflecting the possibility that other factors may also come into play, e.g. an upper size limit on the mitotic spindle [29].

