

**Table S1 – Architecture of the CBB and Axoneme.** When possible we added information of type of MTOCs (interphase and mitotic) as well as presence of multiciliated cells. We used the following definitions: Basal Body – CBB anchored to the cell membrane; Centriole – CBB within a centrosome; Accessory Centriole – CBB that lies next to the basal bodie(s) but that is not anchored to the membrane and not nucleating an axoneme; MTOC – microtubule organizing centre; MT – microtubules; Types of Mitosis: closed –occurs without disassembly of the nuclear membrane; semi-open – MTs enter in the nucleoplasm through fenestrae in the nuclear membrane; open – nuclear membrane completely disassembles; basal body architecture: 9+0 corresponds to an array of nine MT triplets; cilia and flagella architecture: 9+2 corresponds to an array of nine MT doublets and a central MT pair; 9+0 lack the central pair.

<b>Organism Name</b> <b>(Alphabetic Order)</b>	<b>CBB/Axoneme/MTOC structure</b>	<b>References</b>
<i>Arabidopsis thaliana</i>	Multicellular plant that does not have centrioles or flagella in any life cycle stage.	(Beisson and Wright, 2003)
<i>Aspergillus fumigatus</i> <i>Schizosaccharomyces pombe</i> <i>Saccharomyces cerevisiae</i>	Organisms reported as not having centrioles or any flagellated stage in their life cycle. Mitosis is closed and the MTs nucleate from a spindle pole body.	(Beisson and Wright, 2003)
<i>Batrachochytrium dendrobatidis</i> *	Multicellular fungi with flagellated zoospores. There is one basal body and one accessory centriole with 9+0 architecture. One flagellum with 9+2 architecture is nucleated from the basal body. Mitosis is closed with nuclear envelope fenestrae where spindle MTs enter. Spindle MTs nucleate from a mature centriole at each pole. Centrioles persist in non flagellated cells.	(Longcore, 1999; Powell, 1974; Powell, 1981)
<i>Caenorhabditis elegans</i>	Multicellular organism. Sperm has ameboid movement and no flagella. The only ciliated cells are neurons that bear non motile cilia. Cilia are composed of 9 doublets (that become singlets towards the tip). They nucleate on an unusual basal body with 9 doublets and 7 inner singlets. Open mitosis with centrioles with 9 singlets. Multiciliated cells are not present.	(Inglis et al., 2007; Parker et al., 2007; Perkins et al., 1986)
<i>Chlamydomonas reinhardtii</i>	Unicellular green algae with two flagella. The basal bodies have 9+0 architecture and the flagella, 9+2. During mitosis, flagella disassemble and basal bodies migrate towards the inside of the cell, but remain close to the cytoplasmic membrane. Mitosis is semi-open and basal bodies do not colocalize with spindle poles.	(Cavalier-Smith, 1974; Johnson and Porter, 1968; Salisbury et al., 1988)
<i>Ciona intestinalis</i>	Multicellular organism with different cell types bearing flagella/cilia with 9+0 and 9+2 architecture. Basal bodies and centrioles have 9+0 architecture.	(Dilly, 1969; Eakin and Kuda, 1971; Fukumoto,

		2000; Woollacott, 2005)
<i>Cyanidioschyzon merolae</i>	Unicellular red algae without basal bodies and flagella in their life cycle. Mitosis is closed and a MTOC forms at the nuclear membrane.	(Maruyama et al., 2007; Misumi et al., 2005; Nishida et al., 2005; Yagisawa et al., 2007)
<i>Dictyostelium discoideum</i>	Amoeba with no centrioles or flagella in any life cycle stage. They have a modified centrosome without centrioles named Nucleus Associated Body (NAB).	(Ma et al., 1999; Ueda et al., 1999)
<i>Drosophila melanogaster</i>	Multicellular organism with two cell types bearing flagella/cilia. There are cilia with 9+0 (sensory cilia) and 9+2 architecture (sperm flagella) and basal bodies with 9+0. Mitosis is semi-open with centrioles with 9+0 doublets or triplets at the poles. Multiciliated cells are not present.	(Baker et al., 2004; Cunha-Ferreira et al., 2009; Parker et al., 2007; Rodrigues-Martins et al., 2007; Todi et al., 2004)
<i>Encephalitozoon cuniculi</i>	Organism reported as not having centrioles or any flagellated stage in its life cycle. Mitosis is closed and MTs nucleate from MTOCs similar to spindle pole bodies.	(Bigliardi et al., 1998)
<i>Entamoeba histolytica</i>	Parasitic unicellular organism reported as not having centrioles or any flagellated stage in its life cycle. We did not find information about the MTOC during mitosis.	(Rosenbaum and Wittner, 1970)
<i>Homo sapiens</i>	Multicellular organism with different cell types bearing cilia. There are cilia with 9+0 and 9+2 doublets, nucleating from a basal body with 9+0 triplets. Cells with single or multiple cilia are present. Mitosis is open with centrioles with 9+0 triplets.	(Fliegau et al., 2007)
<i>Hydra Sp *</i>	Multicellular organism. A centrosome bearing centrioles is present during interphase. Flagella are present in different cell types including sperm and neurons. Axoneme architecture is 9+2.	(Davis, 1969; Hwang et al., 2008; Summers, 1972)
<i>Monosiga brevicolis*</i>	Unicellular organism with one flagellum with 9+2 architecture. The basal body has 9+0 triplets and it has an accessory centriole. We did not find information about the MTOC during mitosis.	(Hibberd, 1975)
<i>Naegleria gruberi</i>	Unicellular organism where the amoeba stage has no basal body-like structures. Upon differentiation into a flagellated cell (starvation), basal bodies appear <i>de novo</i> (9+0 triplets) nucleating two flagella (9+2 architecture). Mitosis is closed and MTs are directly connected to the nuclear envelope.	(Dingle and Fulton, 1966; Fulton and Dingle, 1971; Levy et al., 1996)
<i>Ostreococcus tauri</i>	Unicellular green algae reported as not having centrioles or any flagellated stage in its life cycle.	(Palenik et al., 2007)

<i>Physcomitrella patens</i> *	Multicellular moss with flagellated sperm. Somatic divisions occur without the contribution of centrioles. They appear <i>de novo</i> in the final mitotic division of each spermatid mother cell. Mature sperm is biflagellated. Centrioles have 9+0 triplets and flagella are likely to have 9+2 architecture. Mitosis is open.	(Merchant et al., 2007; Miller et al., 1983; Moser and Kreitner, 1970)
<i>Plasmodium falciparum</i>	Unicellular organism. Basal bodies appear <i>de novo</i> next to the MTOCs in microgametes with 9+0 triplets and nucleate flagella with 9+2 architecture in the cytoplasm. Mitosis is closed with MTs focusing in a dense structure situated at the nuclear membrane (centriolar plaque).	(Aikawa et al., 1967; Morrisette and Sibley, 2002; Sinden et al., 1978; Sinden et al., 1976)
<i>Tetrahymena thermophila</i>	Multiciliate unicellular organism. Basal bodies have 9+0 triplets and cilia have 9+2 architecture. The macronucleus divides by fission and the micronucleus forms a spindle inside the nucleus (closed mitosis) without centrioles at the poles.	(Dippell, 1968; Dute and Kung, 1978; Jaeckel-Williams, 1978; Jenkins, 1967)
<i>Thalassiosira pseudonana</i> *	Unicellular organism. Basal bodies appear <i>de novo</i> only during gametogenesis and flagella have 9+0 architecture. Mitosis is open and the MTs nucleate from a broad MTOC (electron dense plates). Some authors suggest presence of basal body with 9+0 doublets.	(Heath, 1972; Manton et al., 1969; Manton et al., 1970)
<i>Trichomonas vaginalis</i>	Unicellular organism with 5 flagella. The basal bodies have 9+0 triplets and the flagella have 9+2 architecture. Mitosis is closed and MTs nucleate from a MTOC (atractophore) associated to one of the basal bodies.	(Jemilohun, 1998; Ribeiro et al., 2002; Simpson, 2003)
<i>Trypanosoma cruzi</i>	Unicellular organism with one flagellum (9+2 architecture). The basal body (9+0 triplets) has an accessory centriole. Mitosis is closed and the mitotic MTOC is a ring-like structure at the poles of the spindle.	(Ogbadoyi et al., 2000; Woodward and Gull, 1990)
<i>Ustilago maydis</i>	Organism reported as not having centrioles or any flagellated stage in its life cycle. Mitosis is closed and the MTs nucleate from a spindle pole body like structure.	(Beisson and Wright, 2003)

\* Ultrastructure information for some of the organisms included in this study was unavailable. In these cases we used closely related species for which the ultrastructure is known. For *Batrachochytrium dendrobatidis* we used available data from *Rhizophyidium spherotheca* and *Caulochytrium protostelioides*; for *Hydra* we also added information for *Pennaria tiarella* for *Monosiga brevicolis* we information from *Codosiga botrytis*; for *Physcomitrella patens* we used *Anthoceros laevis*, *Marchantia polymorpha*, *Sphagnum palustre* and *Polytrichum juniperium*; and for *Thalassiosira pseudonana* we used *Lithodesmium undulatum* and *Biddulphia Levis*.