

NUCLEAR DIVISION

Characters and Character States

Division type:

ME, meiosis;

MI, mitosis

1. Centriole

0, absent;

1, present

2. Basic organization of the spindle pole

0, centriolar-associated material;

1, spindle pole body consists of small amount of extranuclear material (Mucoralean zygomycetes);

2, ring-like spindle pole body;

3, spindle pole body a plaque or disc;

4, spindle pole body globular;

3. Spindle pole body form, interphase-prophase:

0, quadrilateral plaque;

1, unlayered disc;

2, a 2-layered disc;

3, a 3-layered disc;

4, a 7- to 9-layered disc;

5, a globoid;

6, a subgloboid with flat internalized layer (Microbotryum);

7, a subgloboid with internalized layer convex with respect to the spindle (Tilletia/Ustilago);

8, notched ring with middle piece and intranuclear component (Erynia);

9, ring containing microtubules but lacking centriolar 9-fold symmetry (Basidiobolus);

a, slight amount of extranuclear and intranuclear material on either side of nuclear envelope (Mucoralean zygomycetes);

b, centriolar-associated extranuclear and intranuclear components with intact nuclear envelope (Catenaria, Blastocladiella);

c, centriole-associated material (Polyphagus)

4. Spindle pole body form, metaphase-anaphase:

- 0, quadrilateral plaque with intact nuclear envelope and internal microtubule organizing center;
- 1, unlayered disc with intact nuclear envelope and internal microtubule organizing center;
- 2, a 2-layered disc with intact nuclear envelope and internal microtubule organizing center;
- 3, a 4-layered disc directly connected to spindle;
- 4, a 5-layered disc directly connected to spindle;
- 5, a 7- to 9-layered disc directly connected to spindle;
- 6, an ellipsoid that expands by more than 100% of its interphase-prophase size directly connected to spindle (*Auricularia*);
- 7, a globoid that expands by more than 100% of its interphase-prophase size directly connected to spindle;
- 8, a globoid with limited enlargement directly connected to spindle;
- 9, a subgloboid with flat internalized layer directly connected to spindle (*Microbotryum*);
 - a, a subgloboid with internalized layer convex with respect to the spindle and directly connected to spindle (*Tilletia/Ustilago*);
 - b, notched ring with persistent half middle piece and clear zone between intranuclear component and nuclear envelope;
 - c, ring containing microtubules but lacking centriolar 9-fold symmetry;
 - d, slight amount of extranuclear and intranuclear material on either side of nuclear envelope (Mucoralean zygomycetes);
 - e, centriolar-associated extranuclear and intranuclear components with intact nuclear envelope (*Catenaria*, *Blastocladiella*);
 - f, centriole associated material (*Polyphagus*)

5. Spindle development site:

- 0, gap in nuclear envelope;
- 1, cytoplasm;
- 2, intranuclear (nuclear envelope intact)

6. Spindle pole body migration (per Heath, 1980, Int. Rev. Cytol. 64:1):

- 0, migration before spindle formation;
- 1, migration during spindle formation;
- 2, formation of adjacent fan-shaped arrays of microtubules that reorient during spindle formation;
- 3, integration of spindle pole body into invaginated nuclear envelope before spindle formation (*Taphrina polystichi*)

7. Metaphase nuclear envelope:

- 0, intact;
- 1, intact with small polar fenestrae plugged by the spindle pole bodies;
- 2, loose polar fenestrae, including extensions of nuclear envelope into the cytoplasm at the spindle pole, but mainly intact;
- 3, partially dispersed;
- 4, nearly or entirely dispersed

8. Telophase nuclear envelope:

0, retention of complete nuclear envelope around the chromatin with median constriction/fragmentation;

1, retention of parts of a disrupted nuclear envelope around the chromatin;

2, new envelope forms within old envelope;

3, dispersed in interzone (*Basidiobolus*);

4, reappearance of nuclear envelope after metaphase;

5, retention of the nuclear envelope around the chromatin with constriction/fragmentation near the poles, and interzone is cut off from the daughter nuclei

9. Perinuclear endoplasmic reticulum:

0, absent;

1, present

10. Spindle vesicles:

0, absent;

1, present

11. Central spindle:

0, absent;

1, present

12. Metaphase plate:

0, absent;

1, present

13. Spindle pole body cap:

0, absent;

1, continuous with the nuclear envelope;

2, distinct from nuclear envelope;

3; fragments of a discontinuous membrane that do not form a true cap

14. Interphase chromatin condensation:

0, absent;

1, present

15. Nucleolus behavior:

0, nucleolus is dispersed and no longer recognizable during prophase;

1, nucleolus discarded between prophase and metaphase;

2, nucleolus or part of it is more persistent and is discarded after metaphase;

3, nucleolus is persistent throughout division

16. Transient intranuclear element at late interphase-prophase:

0, absent;

1, present within nucleus opposite the extranuclear spindle pole body