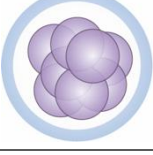


Supplemental Table 1. Morphological diagram of embryos with stage-specific cleavage patterns

Embryo	Illustrations	Description
4-cell embryo		Four blastomeres of equal size
5-cell embryo		Two blastomeres are small and equally sized (purple) Three blastomeres are big and equally sized (blue)
6-cell embryo		Four blastomeres are small and equally sized (purple) Two blastomeres are big and equally sized (blue)
7-cell embryo		Six blastomeres are small and equally sized (purple) One blastomere is big (blue)
8-cell embryo		Eight blastomeres of equal size

Note: Division patterns other than the above categories are defined as non-stage-specific cleavage patterns. For 4- to 7-cell embryos with the stage-specific cleavage patterns described above, this illustration simply shows that their cell division patterns are more plausible. However, they may still exhibit poor developmental rates or less synchronized cleavage. The specific or non-stage-specific cleavage patterns indicate whether the embryo development conforms to the dynamic cleavage regularity, mainly based on cell size, without observation or judgment with a time-lapse imaging system.

Supplemental Table 2. Scoring criteria for cleavage-stage embryos (day 2)

Grade	Number of cells	Symmetry	Fragments	Multinucleation
I	4	Even	<10%	No
IIa	4	Even	10%–25%	No
	2/3/5	With a stage-specific cleavage pattern	<10%	No
IIb	2/3/5	With a stage-specific cleavage pattern	10%–25%	No
III	2–5	Without a stage-specific cleavage pattern or large difference in size between cells	<25%	/
	2–5	/	26%–50%	/
	≥6	/	<50%	/
	/	/	<50%	Yes
IV	/	/	>50%	/

Note: The slash ("/") indicates that this item not need be considered.

Supplemental Table 3. Scoring criteria for cleavage-stage embryos (day 3)

Grade	Number of cells	Symmetry	Fragments	Multinucleation	Supplemental Figure
I	8	Even	<10%	No	2A
IIa	8	Even	10%–25%	No	2B
	≥8	Most cells are relatively even	<10%	No	2C
	6–7	With a stage-specific cleavage pattern	<10%	No	2D
IIb	≥8	Most cells are relatively even	10%–25%	No	2E
	6–7	With a stage-specific cleavage pattern	10%–25%	No	2F
IIIa	4–5	With a stage-specific cleavage pattern	<25%	No	2G, 2H
IIIb	≥4	Large difference in size between cells or without a stage-specific cleavage pattern	<25%	/	2I, 2J
	≥4	/	26%–50%	/	2K
	/	/	<50%	Yes	2L, 2M
IV	<4	/	/	/	2N
	/	/	>50%	/	2O

Note: The slash ("/") indicates that this item not need be considered.

Supplemental Table 4. Staging criteria for blastocysts (days 5/6/7)

Stage	Name	Morphological description	Supplemental Figure
1	Early blastocyst I	Blastocoel <1/2 of total embryo volume	4A
2	Early blastocyst II	Blastocoel $\geq$ 1/2 of total embryo volume	4B
3	Expansion-stage blastocyst	Fully expanded blastocoel filling the entire embryo	4C
4	Fully expanded blastocyst	Significant increase in embryo size and a thinner zona pellucida (typically, the thickness is <5 μ m)	4D
5	Hatching blastocyst	Trophectoderm cells begin to hatch from the zona pellucida	4E, 4F
6	Hatched blastocyst	Complete hatching of the blastocyst from the zona pellucida	4G

Supplemental Table 5. Grading scale for the inner cell mass of stage 3–6 blastocysts

Grade	Morphological description	Supplemental Figure
A	Many cells, tightly packed and fused with regular morphology (stage 4–6 blastocysts, diameter >60 µm)	4H
B	A few cells, but more loosely grouped with irregular morphology (stage 4–6 blastocysts, diameter >60 µm)	4I, 4J
C	Very low cell count, small or inconspicuous cell mass degeneration, or apoptosis in some cells	4K, 4L
D	No ICM-like cell mass or completely degenerated	4M

ICM, inner cell mass.

Supplemental Table 6. Grading scale for the trophectoderm of stage 3–6 blastocysts

Grade	Morphological description	Supplemental Figure
A	Many cells present along the “equatorial plane” of the blastocyst, tightly packed, uniform in size, with clear morphology on the bottom surface of the blastocyst, and mostly with clearly visible nuclei (number of cells along the equatorial plane of a stage-4 blastocyst >15).	4N
B	Adequate number of cells present along the “equatorial plane” of the blastocyst, relatively loosely arranged, and not uniform in size. Some of the cells on the bottom surface of the blastocyst are well-defined and some of them have visible nuclei (8–15 cells along the equatorial plane of a stage-4 blastocyst).	4O
C	Very few cells present along the “equatorial plane” of the blastocyst, with significant heterogeneity in size, obvious fragmentation between the trophoblast and zona pellucida, and indistinct cells on the bottom surface of the blastocyst (<8-cell along the equatorial plane of a stage-4 blastocyst).	4P

TE, trophectoderm.

Supplemental Table 7. Definition of high-quality embryos and usable embryos on days 2/3

Embryo	Day 2	Day 3
High-quality embryos	I/4 IIa/2–5	I/8 IIa/7–14 Early compaction (≥ 7 -cells)
Usable embryos	I–III grade	I–III grade

Supplemental Table 8. Definition of high-quality blastocysts and usable blastocysts

Embryo	Day 5	Day 6	Day 7
High-quality blastocysts	Stage 3 and above, blastocysts graded as AA, AB, BA, or BB.	Stage 4 and above, blastocysts graded as AA, AB, BA, or BB.	/
Usable blastocysts	High-quality blastocysts, stage 3 and above, blastocysts graded as AC, CA, BC, or CB.		Stage 4 and above, blastocysts graded as AA, AB, BA, or BB.

Note: The slash ("/") indicates that this item does not need to be considered.