

Supplementary Information

Figs. S1-S11. 4D analysis of embryos

Table of schemes showing the 8-cell-stage, the 32-cell-stage before cavitation, and the blastocyst of all 66 analysed embryos. The centres of gravity of the regions of the 8-cell-stage descendants are shown for the 32-cell-stage before cavitation and for the blastocyst (for colour code and details see Fig. 2A-D). Embryos are sorted by class. Whether the blastocyst is embryonic/abembryonic (green square), half-half (orange square) or mixed (red square) is indicated.

Supplemental Movies

To observe all details in the movies, please play them also by using the left and right cursors. The movies have been made using Adobe Image Ready, Volocity (Improvision Ltd.) and ImageJ.

Movie S1. Time-lapse imaging of early mouse development

Movie showing a merge of fluorescence and DIC to illustrate our method. The nuclear staining using EGFP tagged histone H2B (Hadjantonakis and Papaianou, 2004) can be seen.

Movie S2. 4D analysis of normal mouse development

DIC movie and the corresponding 3D representation of an embryo from the 2-cell-stage to blastocyst. The 3D representation illustrates the movement of cells by mitoses and the rotation of the embryo.

Table S1 Contribution of progeny of 1st and 2nd dividing blastomeres to the inner cell mass and trophectoderm lineages

Class	Embryo	Total Cells	TE				ICM					
			from 1st	(%)	from 2nd	(%)	from 1st	(%)	from 2nd	(%)		
ME	1	31	20	9	45	11	55	11	6	55	5	45
	2	32	21	12	57	9	43	11	4	36	7	64
	3	31	20	11	55	9	45	11	5	45	6	55
	4	32	17	10	59	7	41	15	6	40	9	60
	5	29	20	9	45	11	55	9	4	44	5	56
	6	32	21	11	52	10	48	11	5	45	6	55
	7	32	17	10	59	7	41	15	6	40	9	60
	8	32	16	7	44	9	56	16	9	56	7	44
	9	31	19	11	58	8	42	12	4	33	8	67
	10	32	23	12	52	11	48	9	4	44	5	56
	11	32	20	10	50	10	50	12	6	50	6	50
	12	32	24	11	46	13	54	8	5	63	3	38
	13	32	21	11	52	10	48	11	5	45	6	55
	14	32	19	10	53	9	47	13	6	46	7	54
	15	32	20	11	55	9	45	12	5	42	7	58
	16	32	21	11	52	10	48	11	5	45	6	55
	17	33	21	10	48	11	52	12	6	50	6	50
	18	31	19	10	53	9	47	12	6	50	6	50
	19	32	19	10	53	9	47	13	6	46	7	54
	20	32	19	9	47	10	53	13	7	54	6	46
	21	32	19	9	47	10	53	13	7	54	6	46
	22	34	23	10	43	13	57	11	6	55	5	45
	23	32	18	8	44	10	56	14	8	57	6	43
	24	32	20	12	60	8	40	12	4	33	8	67

Class	Embryo	Total Cells	TE				ICM					
			from 1st	(%)	from 2nd	(%)	from 1st	(%)	from 2nd	(%)		
EM	1	31	18	10	56	8	44	13	6	46	7	54
	2	32	23	11	48	12	52	9	5	56	4	44
	3	32	21	11	52	10	48	11	5	45	6	55
	4	32	20	10	50	10	50	12	6	50	6	50
	5	32	19	9	47	10	53	13	7	54	6	46
	6	32	19	9	47	10	53	13	7	54	6	46
	7	32	19	10	53	9	47	13	6	46	7	54
	8	32	19	7	37	12	63	13	9	69	4	31
	9	32	18	9	50	9	50	14	7	50	7	50
	10	32	21	9	43	12	57	11	8	73	3	27
	11	32	19	9	47	10	53	13	7	54	6	46
	12	32	23	11	48	12	52	9	5	56	4	44
	13	32	21	11	52	10	48	11	5	45	6	55
	14	30	18	8	44	10	56	12	6	50	6	50
	15	31	22	10	45	12	55	9	5	56	4	44
	16	32	19	11	58	8	42	13	5	38	8	62
	17	32	21	11	52	10	48	11	5	45	6	55
	18	32	19	9	47	10	53	13	7	54	6	46
	19	32	17	9	53	8	47	15	7	47	8	53
	20	31	20	9	45	11	55	11	7	64	4	36
	21	32	18	9	50	9	50	14	7	50	7	50
	22	32	21	12	57	9	43	11	7	64	4	36

Class	Embryo	Total Cells	TE				ICM					
			from 1st	(%)	from 2nd	(%)	from 1st	(%)	from 2nd	(%)		
MM	1	32	19	9	47	10	53	13	7	54	6	46
	2	32	22	12	55	10	45	10	4	40	6	60
	3	32	20	11	55	9	45	12	5	42	7	58
	4	32	20	8	40	12	60	12	8	67	4	33
	5	32	22	10	45	12	55	10	6	60	4	40
	6	32	20	9	45	11	55	12	7	58	5	42
	7	32	21	9	43	12	57	11	7	64	4	36
	8	32	20	11	55	9	45	12	5	42	7	58
	9	32	21	12	57	9	43	11	4	36	7	64
	10	32	20	9	45	11	55	12	7	58	5	42
	11	32	19	9	47	10	53	13	7	54	6	46
	12	32	21	9	43	12	57	11	7	64	4	36
	13	31	20	10	50	10	50	11	5	45	6	55
EE	1	32	22	11	50	11	50	10	5	50	5	50
	2	32	17	8	47	9	53	15	8	53	7	47
	3	32	22	8	36	14	64	10	8	80	2	20
	4	32	21	11	52	10	48	11	5	45	6	55
	5	32	22	14	64	8	36	10	7	70	3	30
	6	32	20	9	45	11	55	12	7	58	5	42
	7	32	21	9	43	12	57	11	7	64	4	36

ME embryos table 1

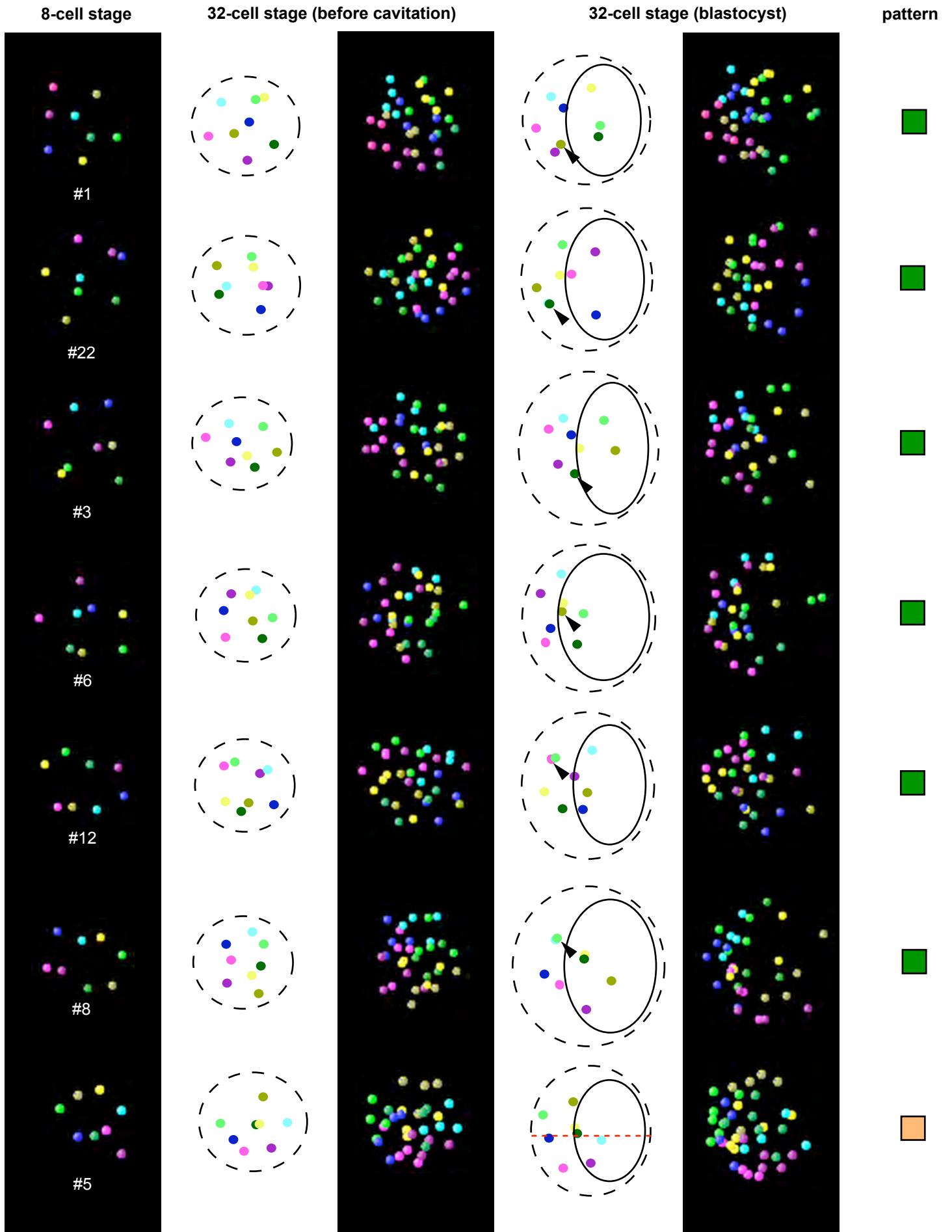


Figure S1

ME embryos table 2

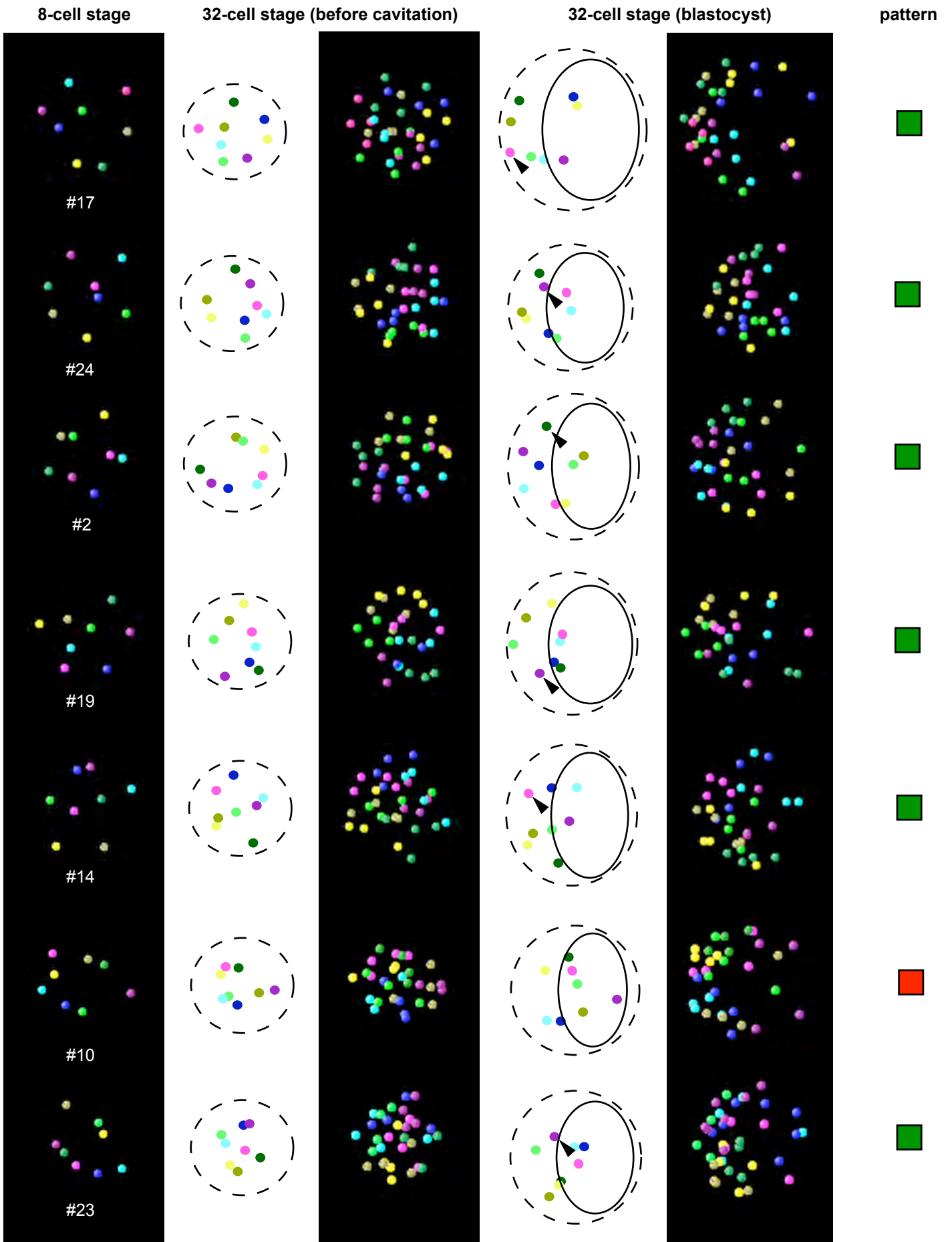


Figure S2

ME embryos table 3

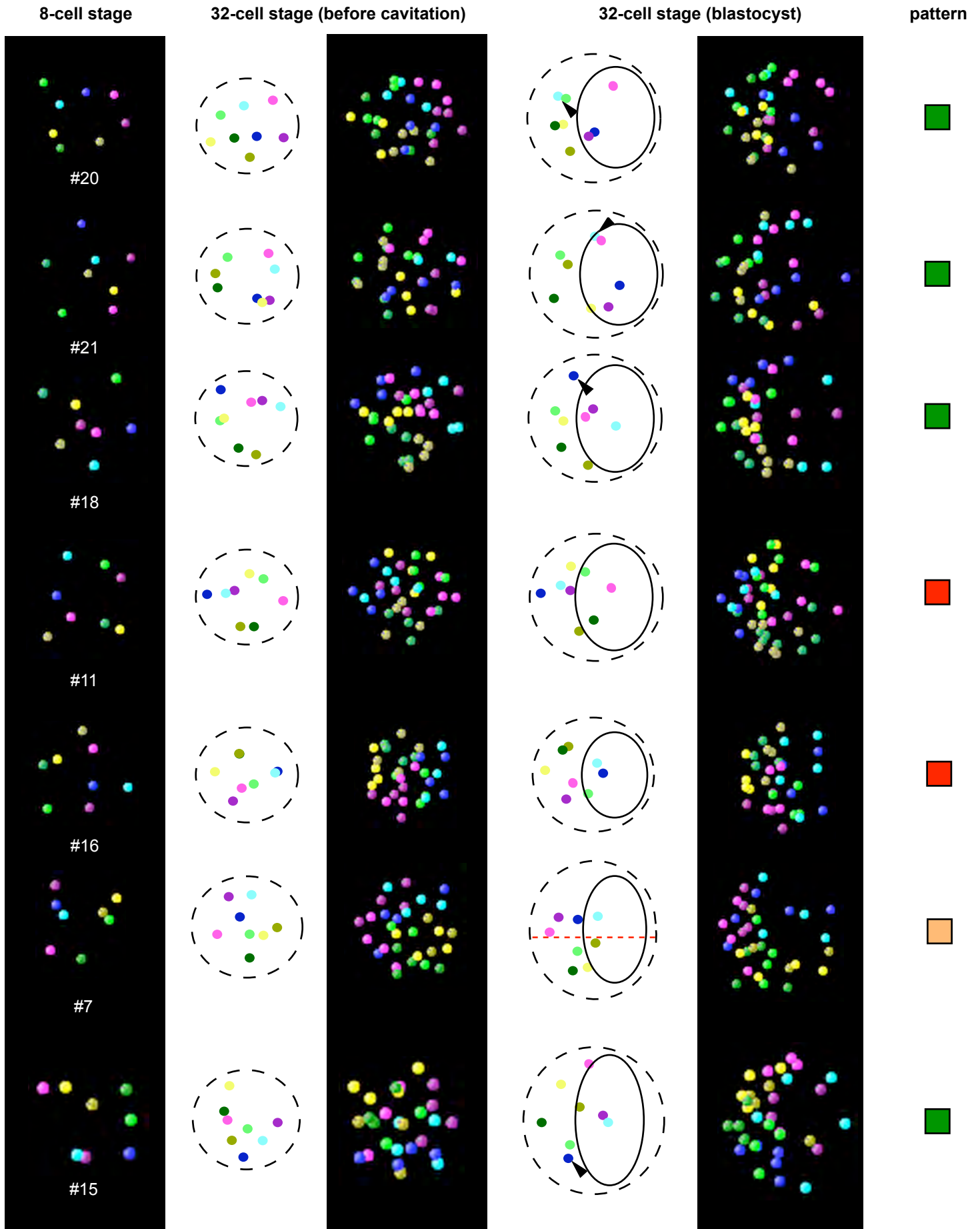


Figure S3

ME embryos table 4

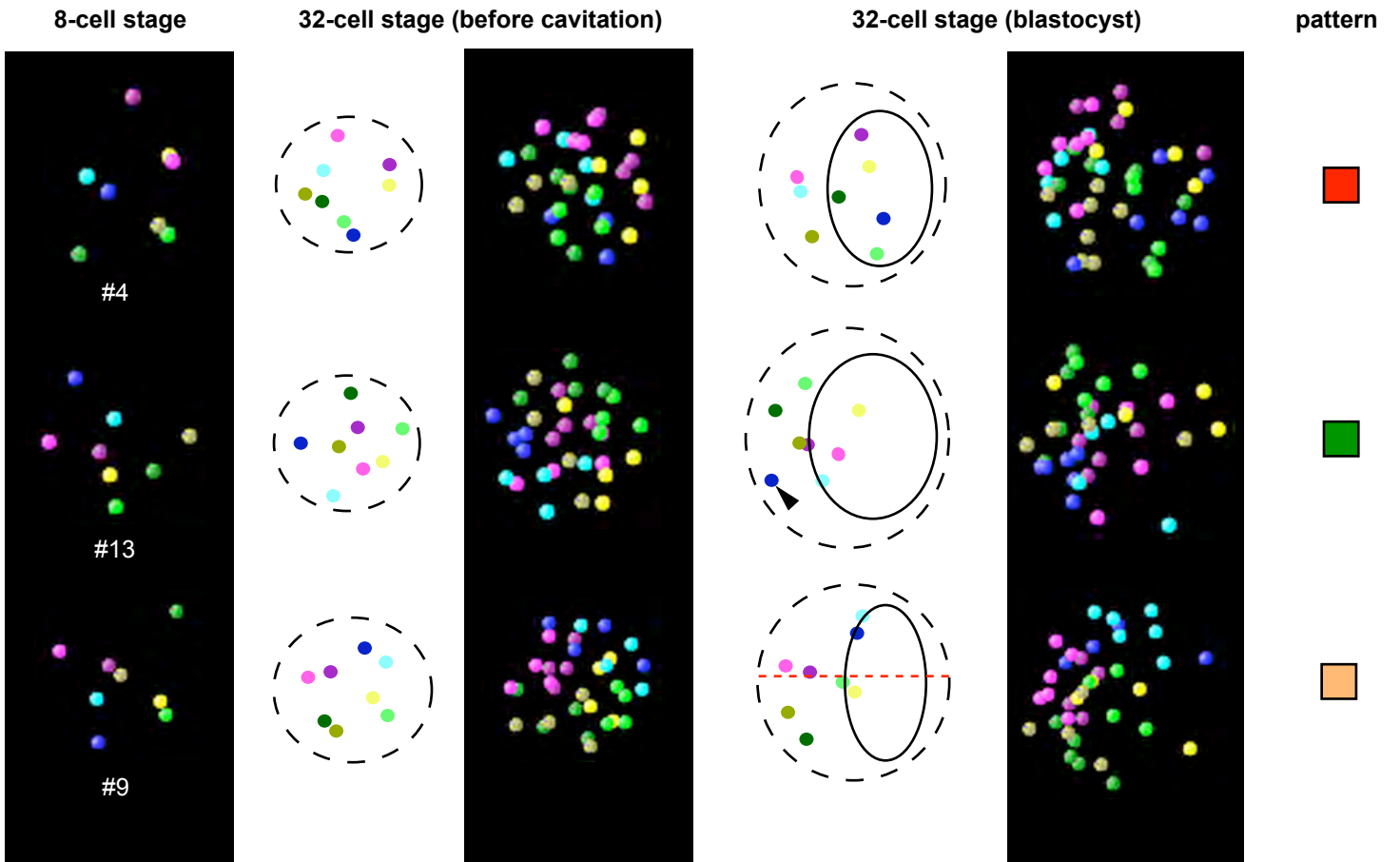


Figure S4

EM embryos table 1

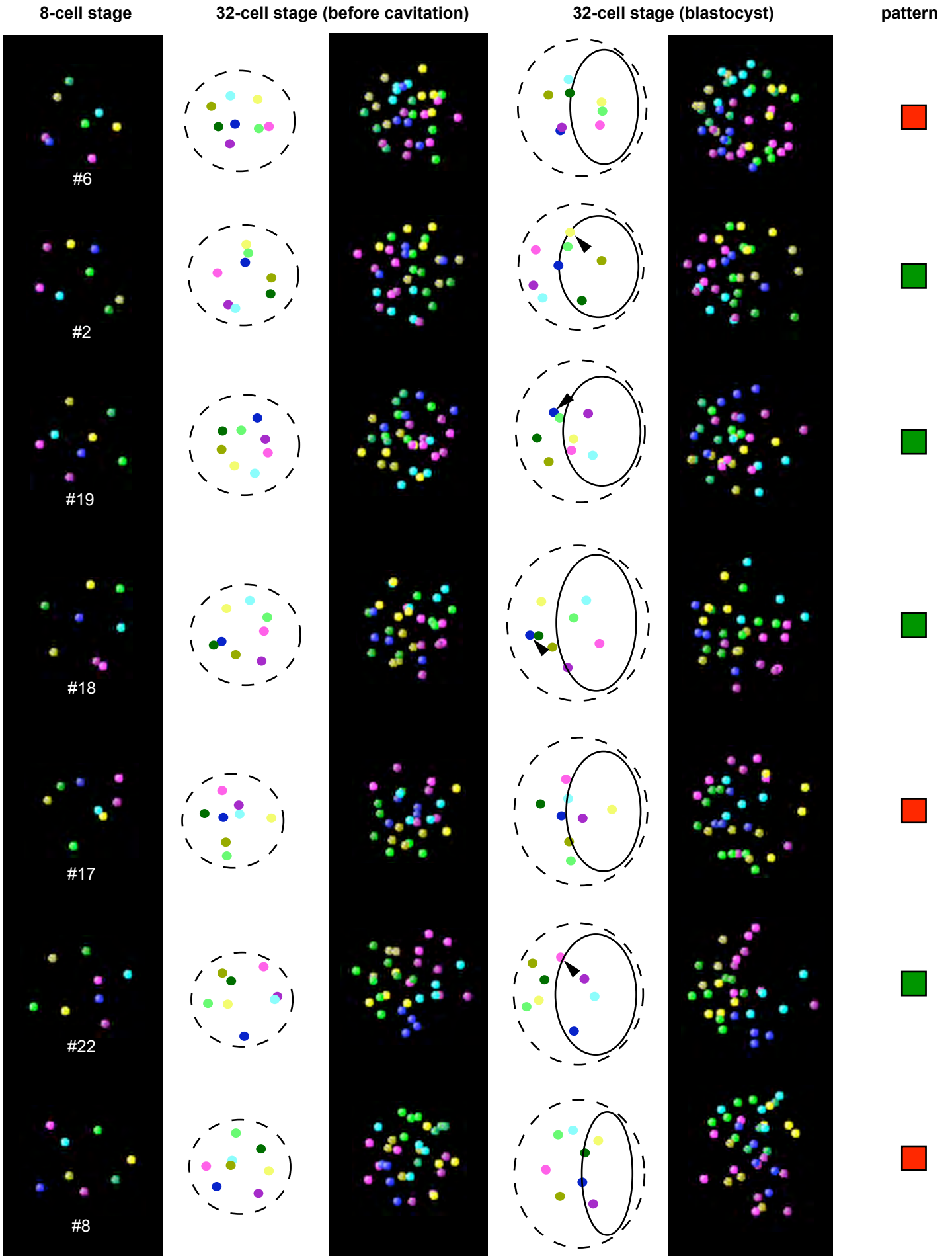


Figure S5

EM embryos table 2

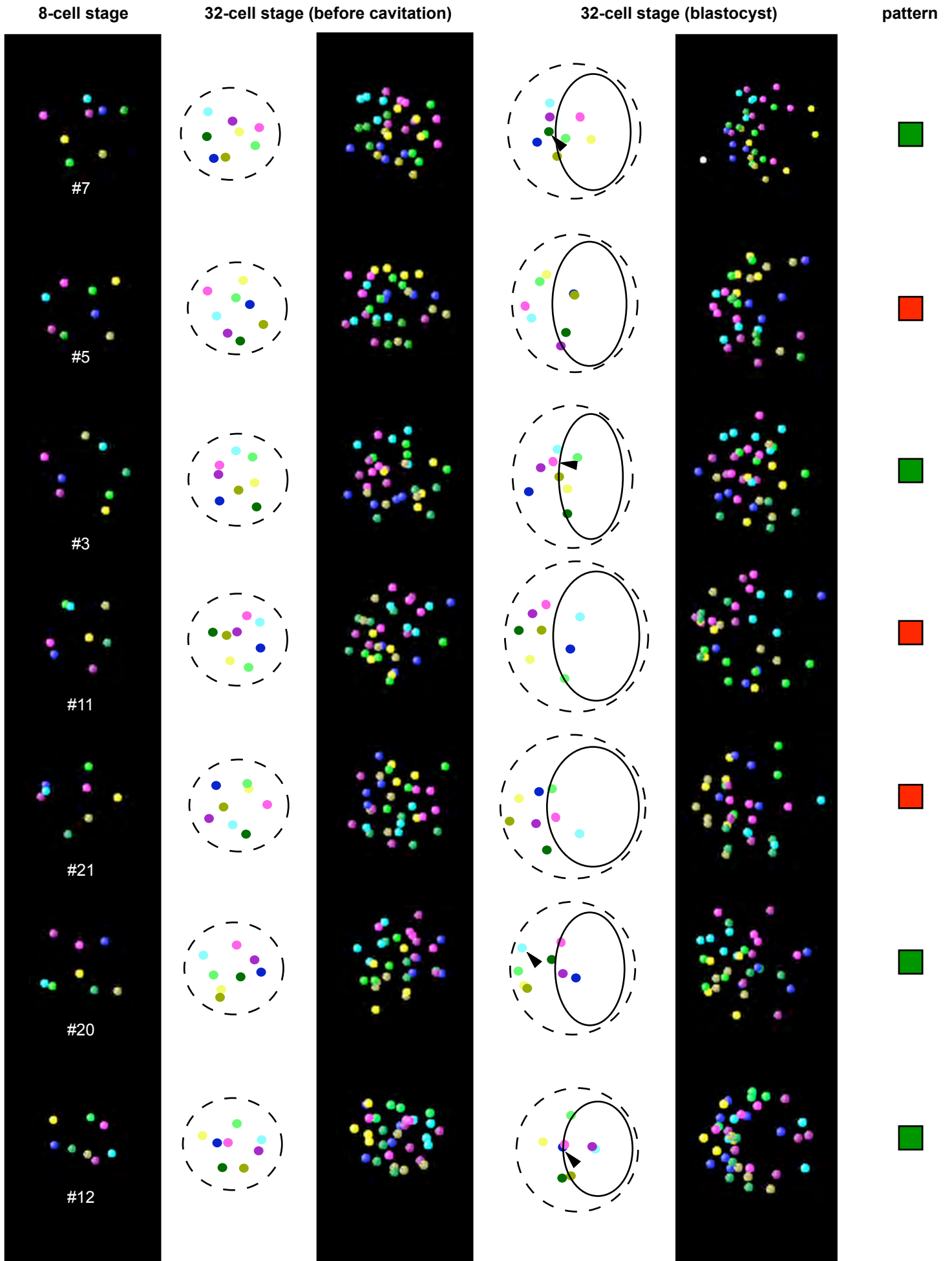


Figure S6

EM embryos table 3

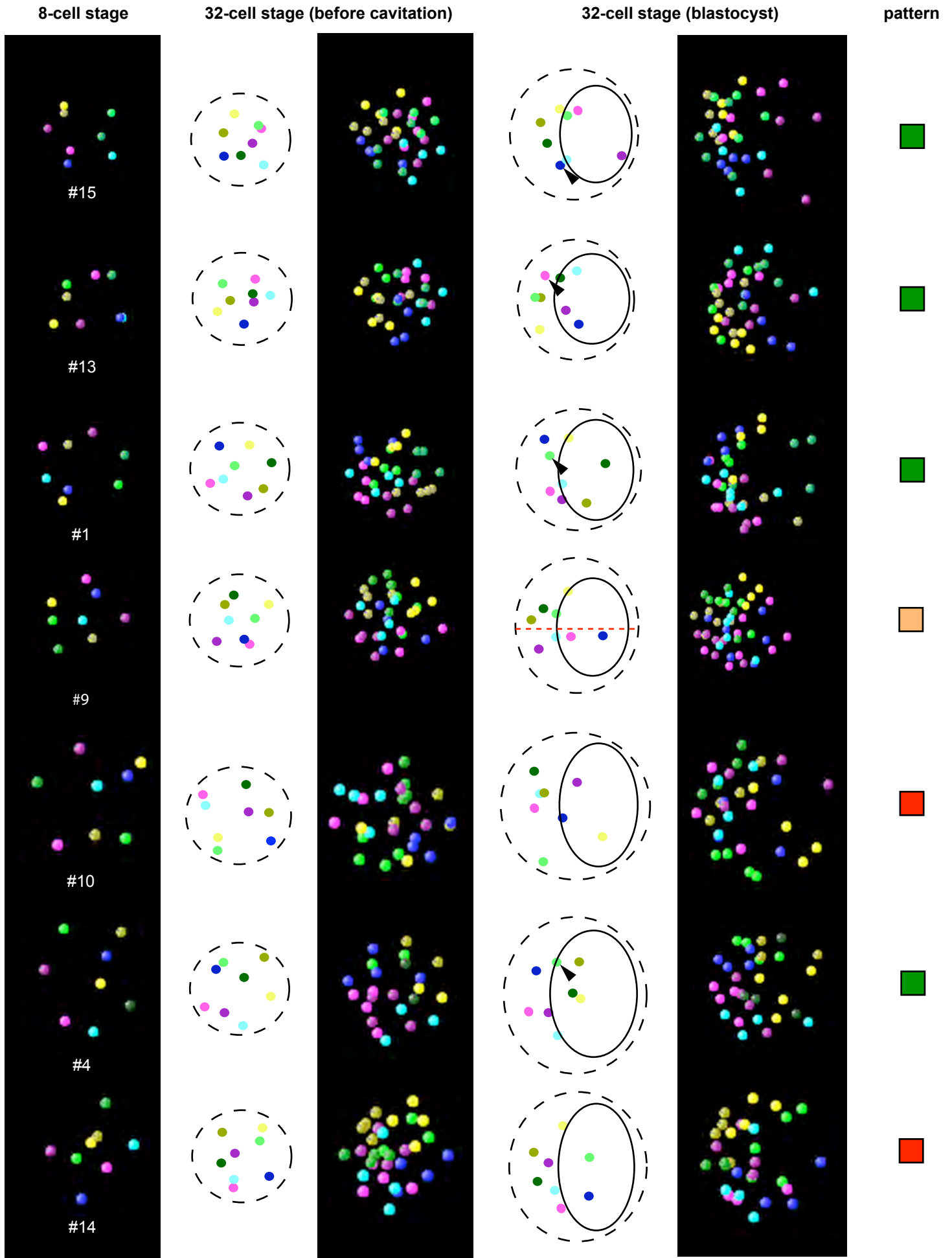


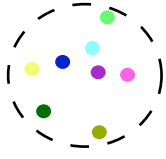
Figure S7

EM embryos table 4

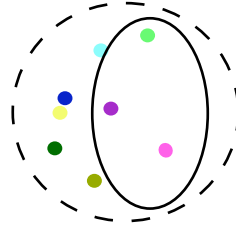
8-cell stage



32-cell stage (before cavitation)



32-cell stage (blastocyst)



pattern



Figure S8

MM embryos table 1

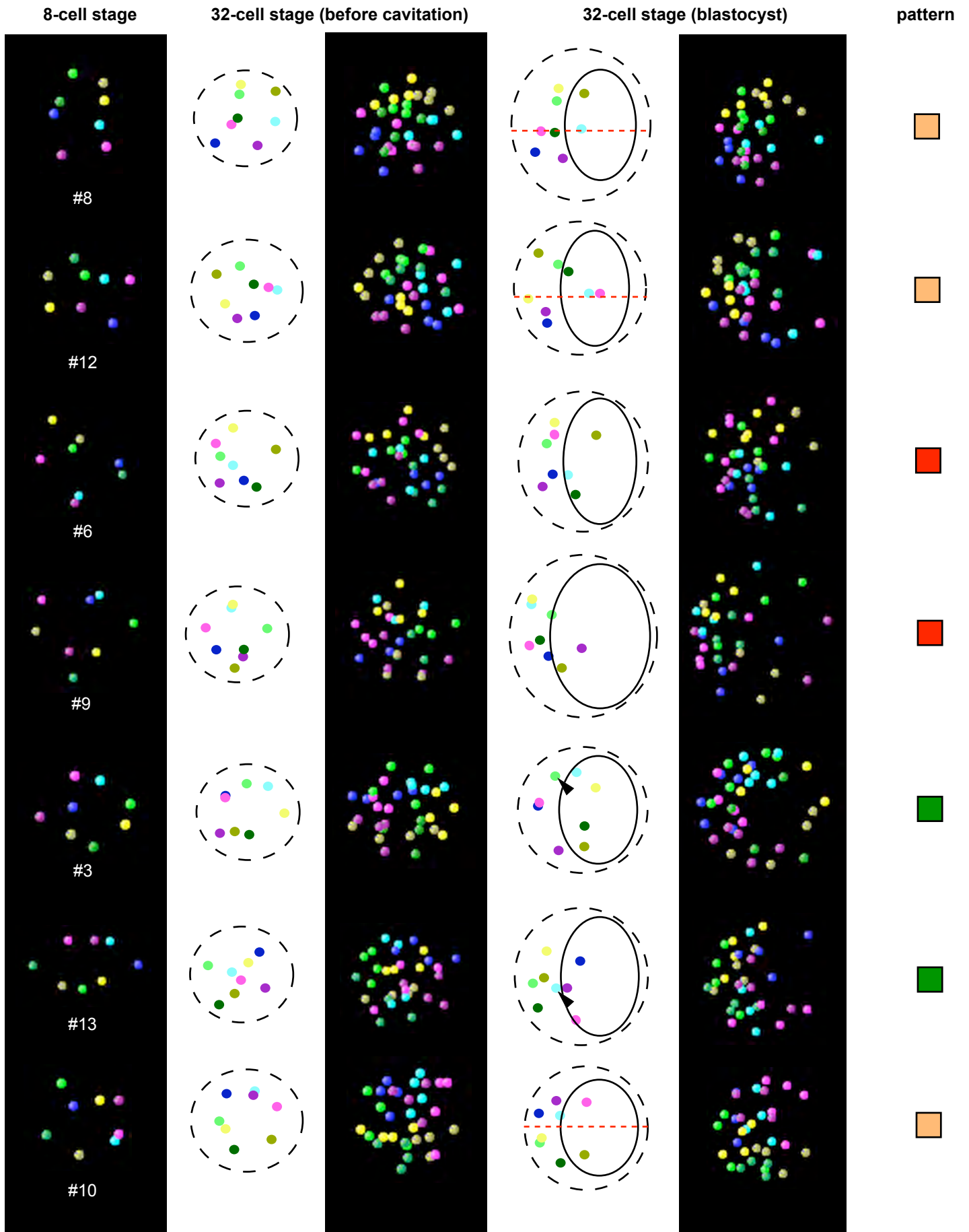


Figure S9

MM embryos table 2

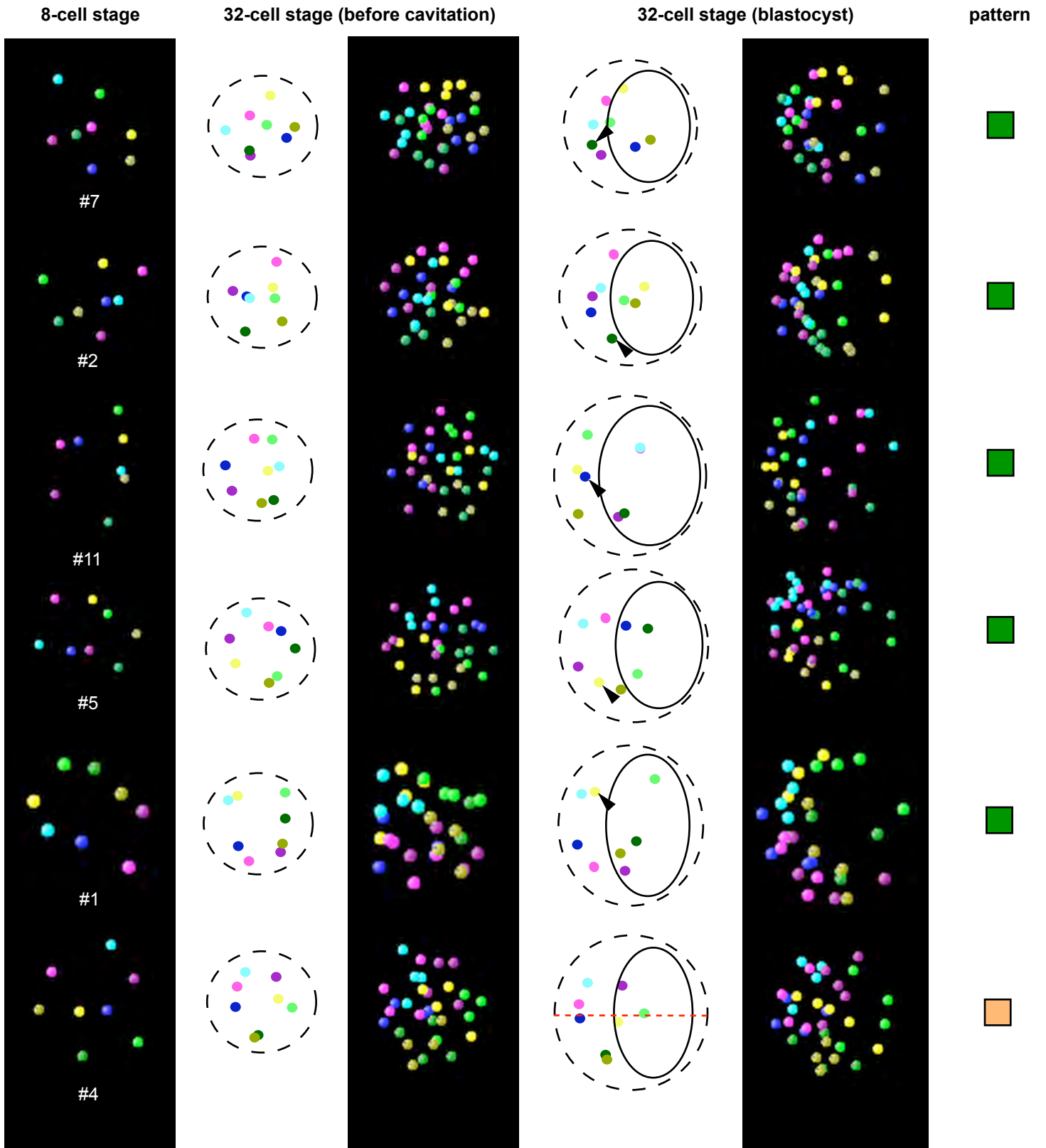


Figure S10

EE embryos table 1

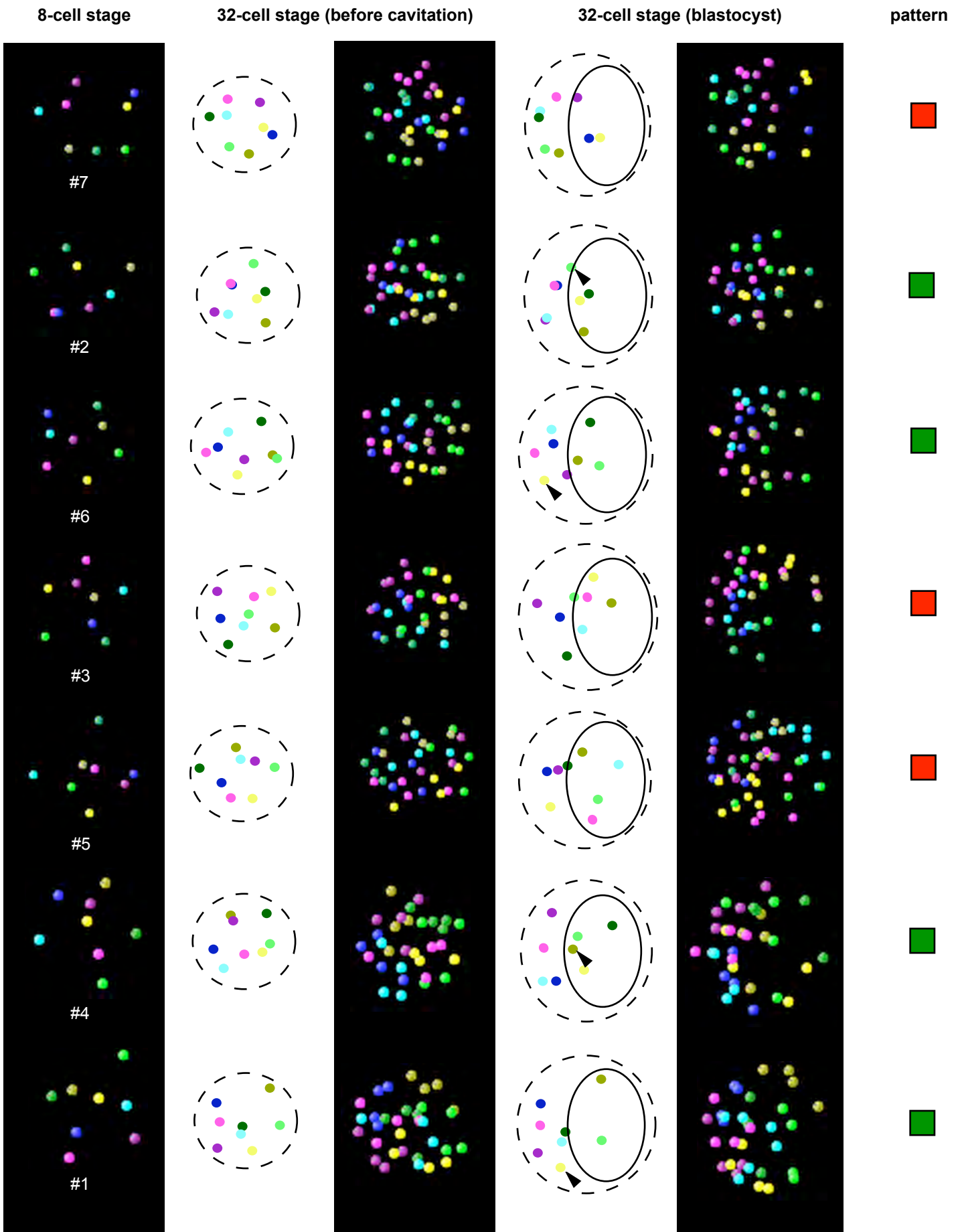


Figure S11