TABLES

Table 1. Anteroposterior nuclear migration during the cleavage stage under a restrictive condition

Strain		Nuclear cycle 1	2	3	4	5	6	7	8	9
wildtype	ant.	73.4±1.2(11)	72.7±0.8(11)	69.2±1.7(11)	67.3±1.3(10)	74.4±1.5(11)	84.4±1.1(11)	88.0±0.4(12)	90.9±0.4(10)	95.0±0.2(9)
	post.	-	64.4±0.8	55.4±1.5	47.5±1.1	34.9±1.8	23.2±1.9	13.7±0.8	6.4±0.5	1.8±0.1
N441	ant.	74.9±2.1(6)	77.9±1.2(8)	79.0±0.9(8)	75.5±2.0(6)	81.0±1.0(7)	82.9±1.1(12)	86.2±0.7(9)	90.5±0.6(8)	95.0±0.6(5)
	post.	-	74.7±0.6	70.1±1.0	61.7±1.4	58.2±0.8	53.1±1.7	42.6±2.0	33.8±1.4	24.8±2.9
N26	ant.	72.1±3.3(6)	77.6±1.3(9)	81.0±0.6(6)	79.0±0.8(7)	82.0±1.3(7)	85.2±1.4(6)	88.2±2.2(6)	91.2±1.6(7)	94.0±1.5(5)
	post.	-	73.9±1.6	69.7±1.1	62.0±0.8	60.8±1.7	53.9±1.7	53.0±2.5	43.9±2.9	29.9±4.2
par	ant.	70.0±1.1(7)	73.2±1.3(4)	70.2±0.4(3)	67.6±4.3(3)	72.0±2.5(4)	75.7±2.9(5)	79.2±1.2(8)	85.5±0.9(6)	91.9±2.3(3)
	post.	-	69.8±2.0	63.6±1.5	56.1±2.7	55.2±2.8	48.0±3.8	42.9±2.7	36.0±2.2	30.1±4.1

The positions of the most anterior (ant.) and the most posterior (post.) nuclei in wildtype, N441, N26 and par embryos at each nuclear cycle under a restrictive temperature (25℃) are shown. The values in this table represent mean ± s.e. in % egg length. The numbers of embryos examined are shown in parentheses.

Table 2. Anteroposterior nuclear migration during the cleavage stage under a permissive condition

Strain		Nuclear cycle 1	2	3	4	5	6	7	8	9
N441	ant.	74.8±1.9(7)	78.1±0.5(7)	75.5±1.5(6)	78.8±1.1(7)	80.9±1.2(8)	83.4±2.5(6)	87.8±0.7(6)	89.6±0.6(5)	96.0±0.3(3)
	post.	-	73.4±1.3	65.7±1.8	61.3±1.8	50.3±1.9	41.9±1.9	37.7±2.3	23.5±3.5	6.2±1.6
N26	ant.	69.4±1.7(10)	68.1±1.0(15)	66.6±1.7(8)	69.3±2.0(10)	73.1±2.7(8)	79.7±1.5(8)	84.4±0.9(8)	89.0±0.8(7)	93.0±0.7(5)
	post.	-	64.7±1.1	54.4±1.1	47.6±2.0	37.0±2.5	21.5±2.2	13.6±2.1	4.6±0.4	2.9±0.4
par	ant.	70.9±2.1(5)	68.7±2.1(7)	65.8±2.1(4)	66.4±1.7(7)	63.1±5.0(3)	78.1±1.4(6)	84.6±2.0(3)	86.2±1.0(9)	89.4±1.7(4)
	post.	-	64.7±1.0	54.9±2.2	45.4±2.2	42.4±2.8	35.8±2.5	19.4±4.7	19.6±3.7	12.1±1.2

The positions of the most anterior (ant.) and the most posterior (post.) nuclei in N441, N26 and par embryos at each nuclear cycle under a permissive temperature (18℃) are shown. The values in this table represent mean ± s.e. in % egg length. The numbers of embryos examined are shown in parentheses.

Table 3. Anteroposterior nuclear migration during the cleavage stage in heterozygous mutant embryos

Strain		Nuclear cycle 1	2	3	4	5	6	7	8	9
N441/+	ant.	75.9±1.0(8)	73.6±1.2(10)	69.1±2.1(6)	69.3±2.4(8)	71.4±1.0(7)	76.6±1.9(7)	87.2±1.0(6)	93.5±0.7(5)	94.9±0.6(3)
	post.	-	66.6±1.2	57.0±2.2	49.0±1.7	35.1±1.6	18.9±2.7	9.3±1.2	3.5±0.1	1.6±0.3
N26/+	ant.	71.2±1.2(13)	71.4±1.5(9)	64.9±1.8(6)	68.0±1.0(7)	71.7±1.7(7)	81.0±1.4(6)	85.5±1.9(5)	91.3±1.3(5)	95.0±0.9(6)
	post.	-	66.8±1.4	52.7±2.3	47.2±2.4	37.3±3.0	19.0±1.7	13.4±2.3	6.7±1.0	3.5±0.8
par/+	ant.	71.4±1.4(6)	73.0±1.6(7)	65.5±2.1(7)	69.6±2.5(6)	74.0±1.7(6)	83.8±1.8(5)	88.3±1.8(5)	93.7±1.2(6)	94.7±0.9(5)
	post.	-	66.4±1.8	52.5±1.9	46.5±3.0	34.0±2.3	17.5±2.1	11.3±2.3	4.6±1.5	1.8±1.0

The positions of the most anterior (ant.) and the most posterior (post.) nuclei in N441, N26 and par heterozygous embryos at each nuclear cycle under a restrictive temperature (25℃) are shown. The values in this table represent mean ± s.e. in % egg length. The numbers of embryos examined are shown in parentheses.

Table 4. Anteroposterior nuclear migration between cycle 1 and 2

Strain	*X*(%EL) mean ± s.e. (n)	*Y*(%EL) mean ± s.e. (n)	Probability
wild type	71.9 ± 0.5 (67)	68.8 ± 0.4 (72)	$p<0.001$ ***
N441	74.9 ± 2.1 (6)	76.3 ± 0.5 (34)	$0.4<p<0.5$ ns
N26	72.1 ± 3.3 (6)	75.4 ± 0.7 (35)	$0.2<p<0.4$ ns

X and *Y* represent the positions of nucleus at cycle 1 and of the midpoint of two nuclei at cycle 2, respectively.
Probabilities were calculated by Mann-Whitney *U* test ($\alpha=0.05$).
***: extremely significant, ns: not significant.

Table 5. Distance between two nuclei at cycle 2

Strain	Total mean ± s.e.(n)	Interphase mean ± s.e.(n)	Prophase mean ± s.e.(n)	Metaphase mean ± s.e.(n)	Anaphase mean ± s.e.(n)	Telophase mean ± s.e.(n)
wild type	11.1 ± 0.3 (61)	10.3 ± 0.5 (14)	10.9 ± 0.4 (17)	11.2 ± 0.7 (14)	12.0 ± 0.8 (8)	11.7 ± 0.5 (8)
N441	8.0 ± 0.4 (26)***	7.0 ± 0.5 (6)**	7.4 ± 0.3 (4)**	9.1 ± 1.1 (6)ns	8.8 ± 1.2 (6)*	7.4 ± 0.2 (4)***
N26	8.4 ± 0.3 (26)***	7.7 ± 0.6 (7)**	9.0 ± 0.7 (9)*	7.6 ± 0.6 (4)*	9.4 ± 0.7 (3)*	8.6 ± 0.8 (3)*

Distance between two nuclei is represented in % egg length. Significances after values of the mutants were calculated against the wild type in the same column by Mann-Whitney *U* test (α=0.05). ns: not significant ($0.05<p$), *: significant ($0.01<p\leq0.05$), **: highly significant ($0.001<p\leq0.01$), ***:extremely significant ($p\leq0.001$).

Table 6. Anteroposterior orientation of two nuclei at cycle 2

Strain	No. of embryos		Total no. of embryos	Probability
	$0° \leqq A < 45°$	$45° \leqq A \leqq 90°$		
wild type (exp. 1)	24 (8.79)	6 (21.21)	30	$p<0.001$ ***
wild type (exp. 2)	20 (9.08)	11 (21.92)	31	$p<0.001$ ***
N441	10 (7.62)	16 (18.38)	26	$0.3<p<0.5$ ns
N26	6 (7.62)	20 (18.38)	26	$0.5<p<0.7$ ns

Probabilities were calculated against expected values from random orientation shown in parentheses (see text) by G test ($\alpha=0.05$). ***: extremely significant, ns: not significant. In the wild type, two different batches of embryos (exp. 1 and 2) were examined.

Table 7. Dorsoventral orientation of two nuclei at cycle 2

Strain	No. of embryos D-V	No. of embryos R-L	Total no. of embryos	Probability	
wild type	10 (14.5)	19 (14.5)	29	$0.2<p<0.4$	ns
N441	11 (11.5)	12 (11.5)	23	$0.9<p$	ns
N26	12 (13.0)	14 (13.0)	26	$0.9<p$	ns

Probabilities were calculated against expected values from random orientation shown in parentheses by *G* test ($\alpha=0.05$). D-V: dorsoventral orientation, R-L: right-left orientation, ns: not significant.

Table 8. Dorsoventral localization of the anterior nucleus at cycle 2

Strain	No. of embryos		Probability		No. of embryos		Probability	
	Dorsal	Ventral			Right	Left		
wild type	20 (14.5)	9 (14.5)	0.1<p<0.2	ns	21 (14.5)	8 (14.5)	0.02<p<0.05	*
N441	8 (11.5)	15 (11.5)	0.4<p<0.6	ns	12 (11.5)	11 (11.5)	0.9<p	ns
N26	16 (13.0)	10 (13.0)	0.6<p	ns	10 (13.0)	16 (13.0)	0.6<p	ns

Probabilities were calculated against expected values from random distribution shown in parentheses by *G* test (α=0.05). "Dorsal", "Ventral", "Right" and "Left" indicate that the anterior nucleus is in the dorsal, ventral, right and left half of each embryo, respectively. Embryos in this table are the same as in Table 7. ns: not significant, *: significant.

Table 9. Summarized results of analyses of proteins in mutant ovaries and embryos by two-dimensional gel electrophoresis

Strain	n	Spot a	b	c	d	e
Ovaries						
+/+	5	+++	++	-	+	+
N441/N441	4	+++	-	++	+	+
N441/N441 18℃*	4	+++	-	++	+	+
N441/FM7	5	+++	-	++	+	+
N441/Df(1)N105	3	+++	-	++	+	+
N441/+	3	+++	+	+	+	+
Df(1)N105/+	3	+++	+	+	+	+
FM7/+	2	+++	+	+	+	+
N26/N26	3	+++	-	++	-	-
N26/FM7	2	+++	-	++	-	±
N441 +/+ N26	4	+++	-	++**	±	±
Embryos						
+/+	2	+++	++	-	+	+
N441/N441	1	+++	-	-	+	+
N441/FM7	4	+++	-	-	+	+

Homogenized 20 ovaries or 30 embryos (30±10 min after egg laying at 25℃) were loaded in each gel. After two-dimensional gel electrophresis, proteins were stained with Coomassie brilliant blue and the stained pattern of the spots was analysed. For embryos, maternal genotypes are shown. *: female flies were maturated for 10 days after eclosion at 18℃. In the other cases, female flies were maturated for 5 days at 25℃. **: the spot was shifted a little to be more acidic than that of the wild type (+/+). The names of the spots (a-e) are defined in Fig. 34, e.g., spot (a) shows actin. n: the number of experiments.