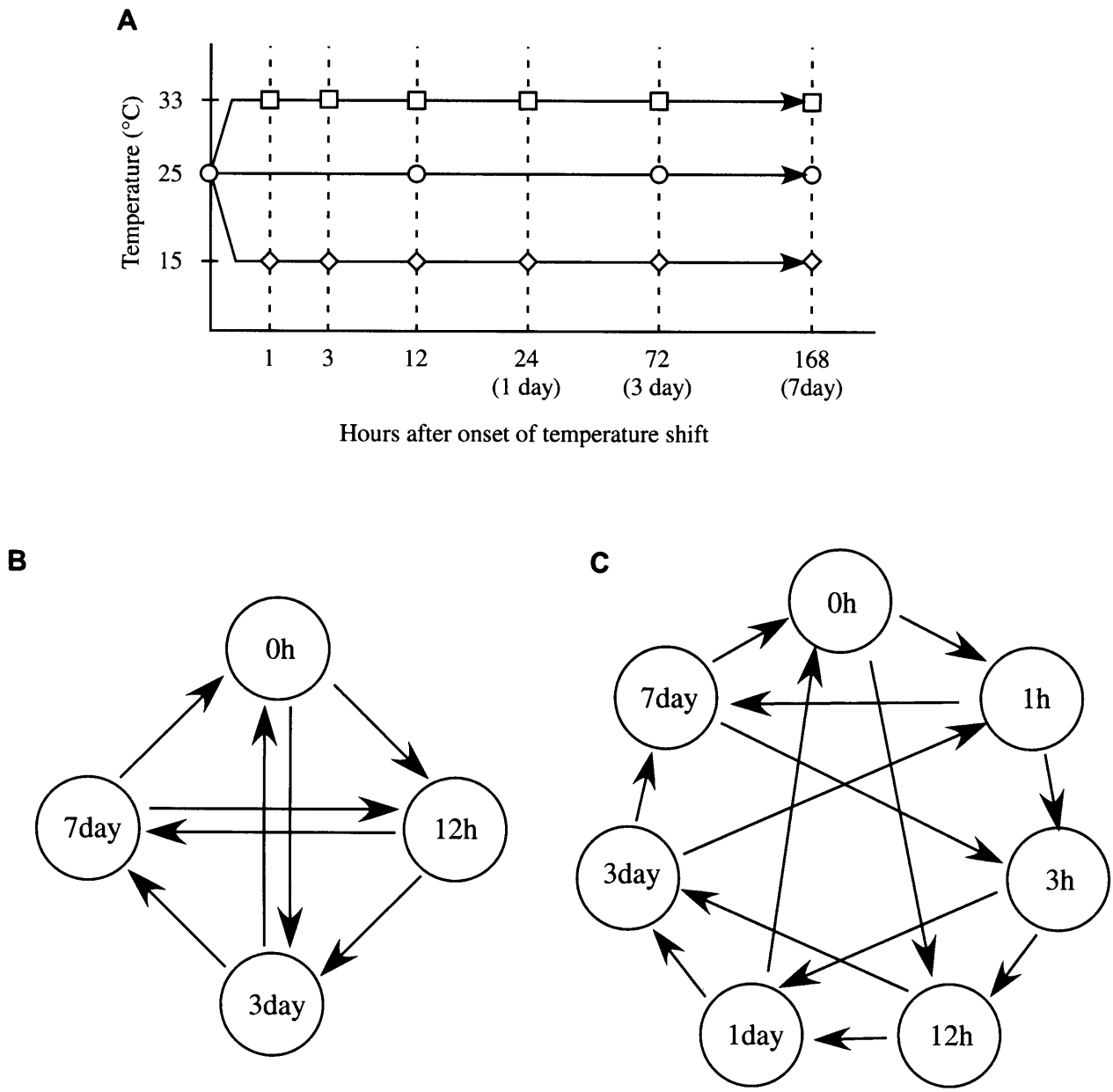


Fig. 3-1. **A**, schematic diagram showing the time course and sampling regime used for cDNAs from the OLHNI-e1 cell line. The culture temperature for the OLHNI-e1 cell line from the Northern Japanese population was maintained at 25°C or shifted from 25°C to 33 and 15°C. Cells were collected at certain time intervals shown by open symbols. **B, C**, loop designs for a total of 4 samples from the experimental group at 25, and 7 samples from those at 15 and 33°C. Each arrow represents a connection flow between two samples to be hybridized for microarray. One each microarray, arrows indicate flows from Cy3-labeled cDNAs to Cy5-labeled cDNAs in comparison.

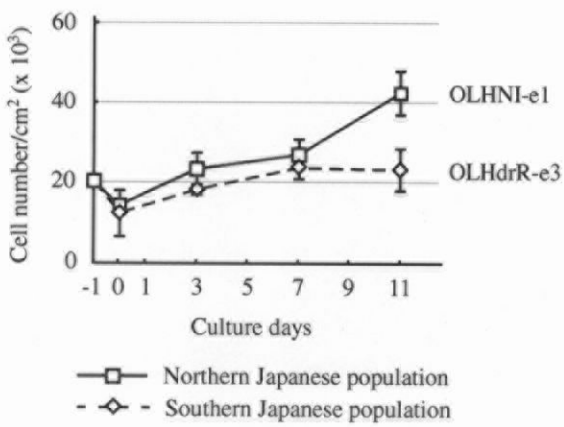


Fig. 3-2. Growth of OLHNI-e1 and OLHdrR-e3 cell lines after temperature shift from 25 to 15°C. Cells, which had been cultured at 25°C were adjusted their numbers to 2 x $10^4$ cells/$cm^2$ and transferred to 15°C. The number of cells per $cm^2$ was determined in three different plates on indicated days. Data are given as means ±SD and marks without vertical lines of SD indicate that these lines are within the sizes of the marks.

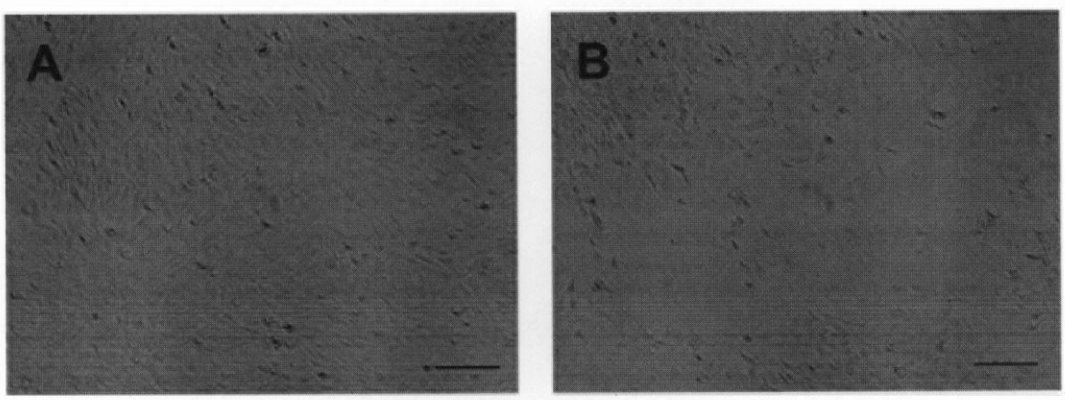


Fig. 3-3. Phase contrast micrographs of OLHNI-e1 (**A**) and OLHdrR-e3 (**B**) cell lines from the Northern and Southern Japanese populations, respectively. Cells, which had been cultured at 25°C, were adjusted their numbers to 2 x $10^4$ cells/$cm^2$ and transferred to 15°C. Day 14 after temperature shift are shown. OLHNI-e1 proliferated and formed a confluent monolayer over the entire surface of the plate, while OLHdrR-e3 did not. Bars indicate 200 μ m.

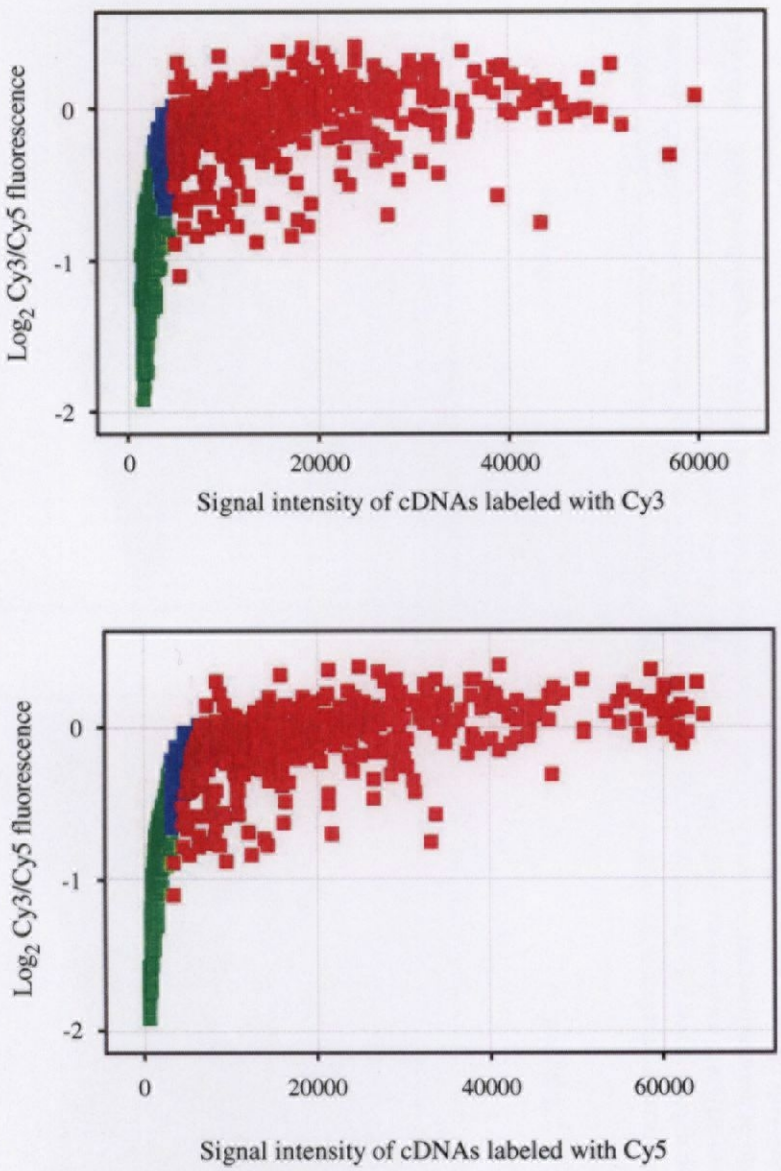


Fig. 3-4. Relationship of signal intensities of CyDyes with signal intensity ratios of Cy3/Cy5 ratio. Total RNAs isolated from the OLHNI-e1 cell line cultured at 25°C were used to prepare amino allyl labeled cDNA followed by Cy3 and Cy5 labelling. Red, blue and green symbols indicate clones with adequate signal intensity for the two CyDyes, adequate signal intensity for only one CyDye, and clones with inadequate signal intensity for two CyDyes, respectively.

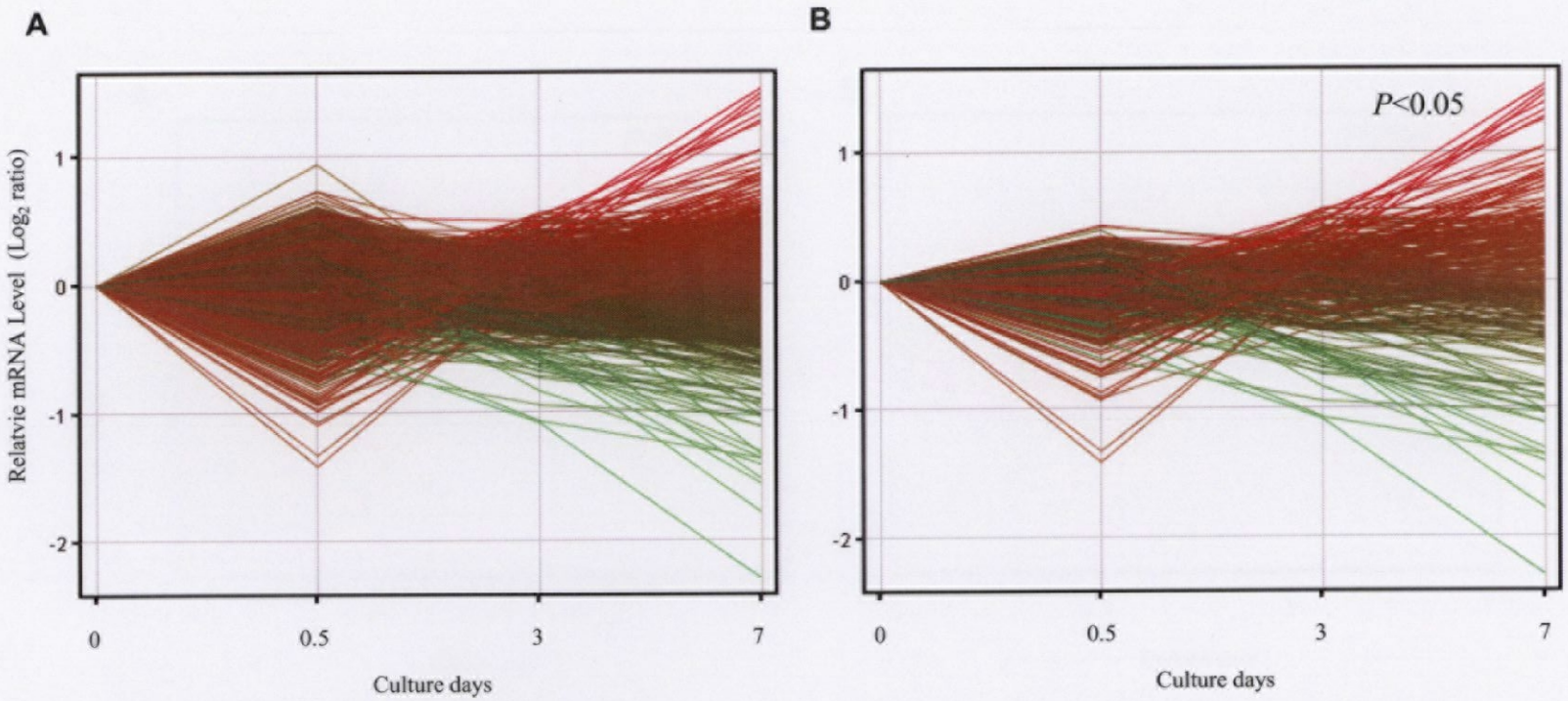


Fig. 3-5. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 25°C. Lines represent cDNA clones which showed the changes in the mRNA levels (**A**) and those at a significant level of $P<0.05$ in at least one comparison among the accumulated mRNA levels from different incubation periods (**B**). Statistical analysis was performed by Kruskal-Wallis ANOVA. Y-axis represents the ratio of accumulated mRNA levels of each incubation period to those of 0 h at a logarithmic scale. Red and green color gradient represents changed in the accumulated mRNA levels of cDNA clones at different levels from increased to decreased ones during culture for 7 days.

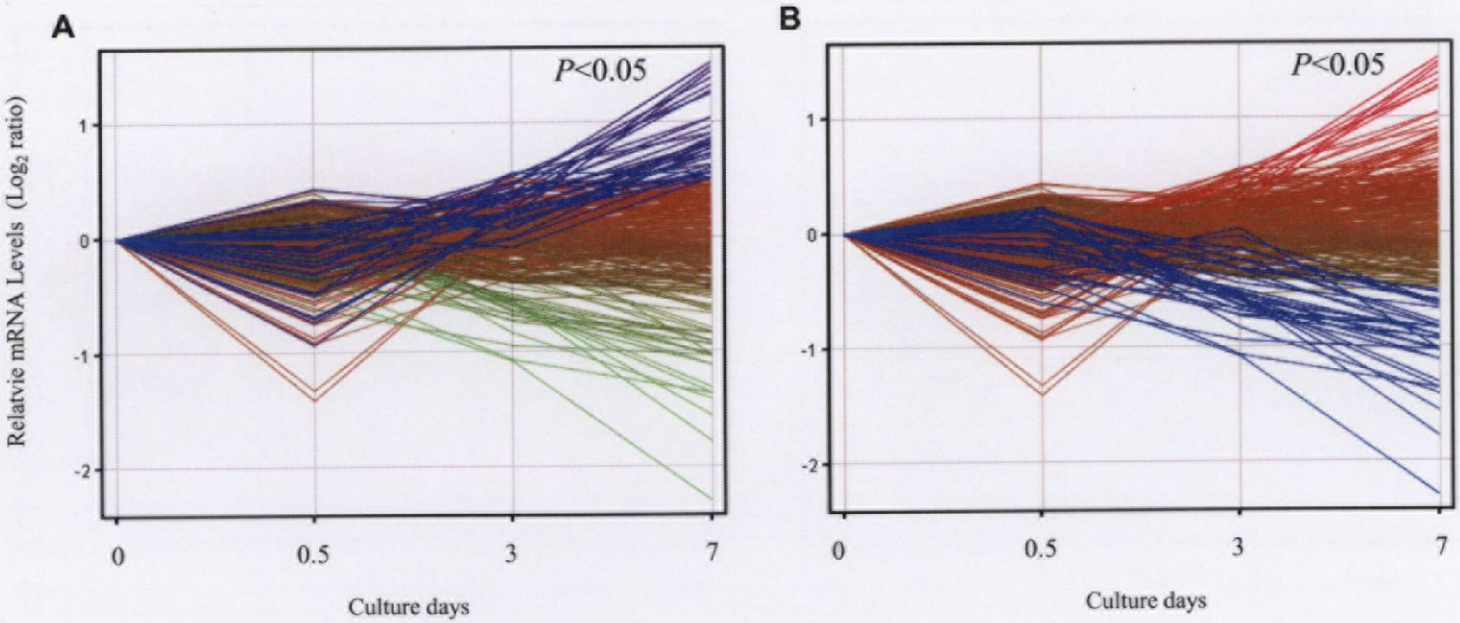


Fig. 3-6. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 25°C ($P$<0.05). The expression patterns of cDNA clones which showed the changes in the relative accumulated mRNA levels more than 0.5 (**A**) and less than -0.5 (**B**) in $\log_2$ ratio of accumulated mRNA levels for 7 days are shown by blue lines. Statistical analysis was performed by Kruskal-Wallis ANOVA as shown in Fig. 3-5. Y-axis and color gradient are determined as shown in Fig. 3-5.

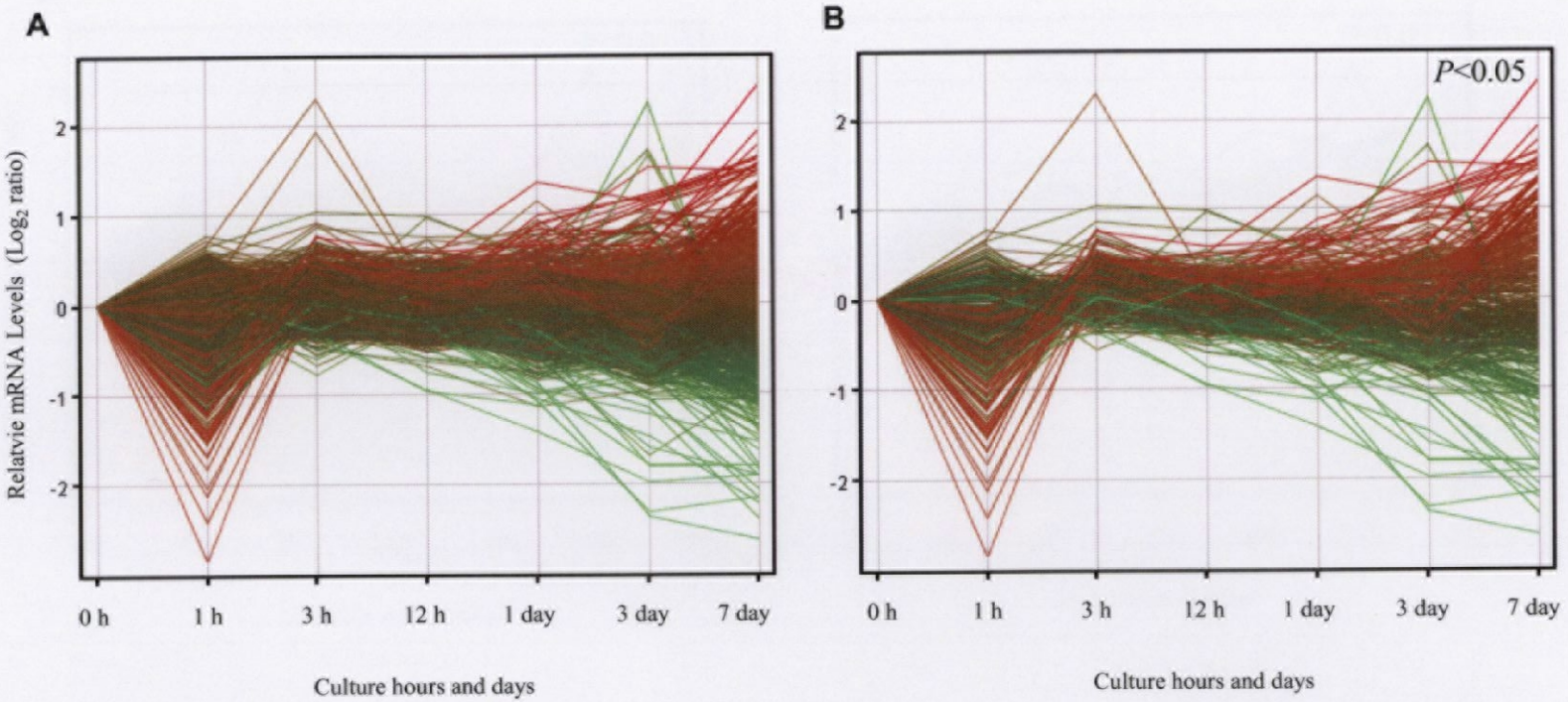


Fig. 3-7. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 15°C. Lines represent cDNA clones which showed the changes in the mRNA levels (**A**) and those at a significant level of $P<0.05$ in at least one comparison among the accumulated mRNA levels from different incubation periods (**B**). Statistical analysis was performed by Kruskal-Wallis ANOVA. Y-axis and color gradient are determined as shown in Fig. 3-5.

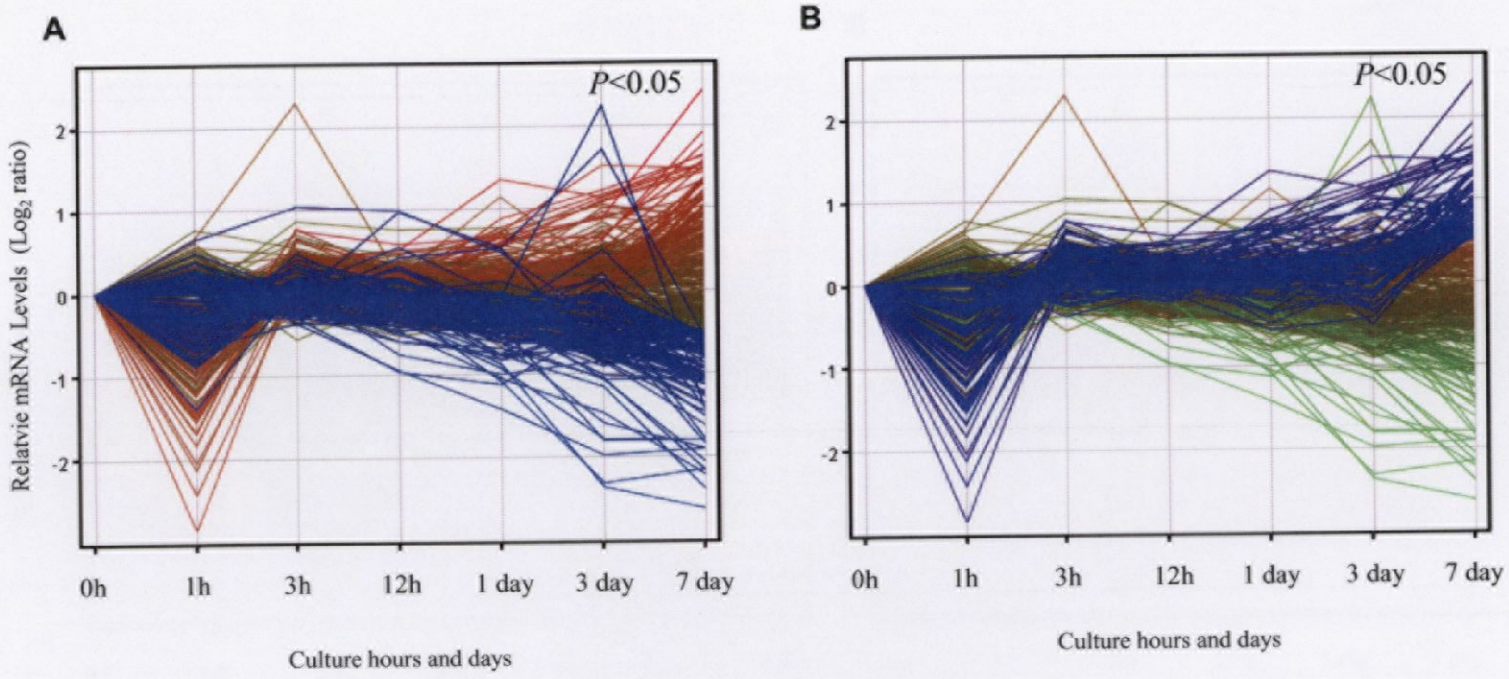


Fig. 3-8. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 15°C ($P$<0.05). The expression patterns of cDNA clones which showed the changes in the relative accumulated mRNA levels more than 0.5 (**A**) and less than -0.5 (**B**) in $\log_2$ ratio for 7 days are shown by blue lines. Statistical analysis was performed by Kruskal-Wallis ANOVA as shown in Fig. 3-7. Y-axis and color gradient are determined as shown in Fig. 3-5.

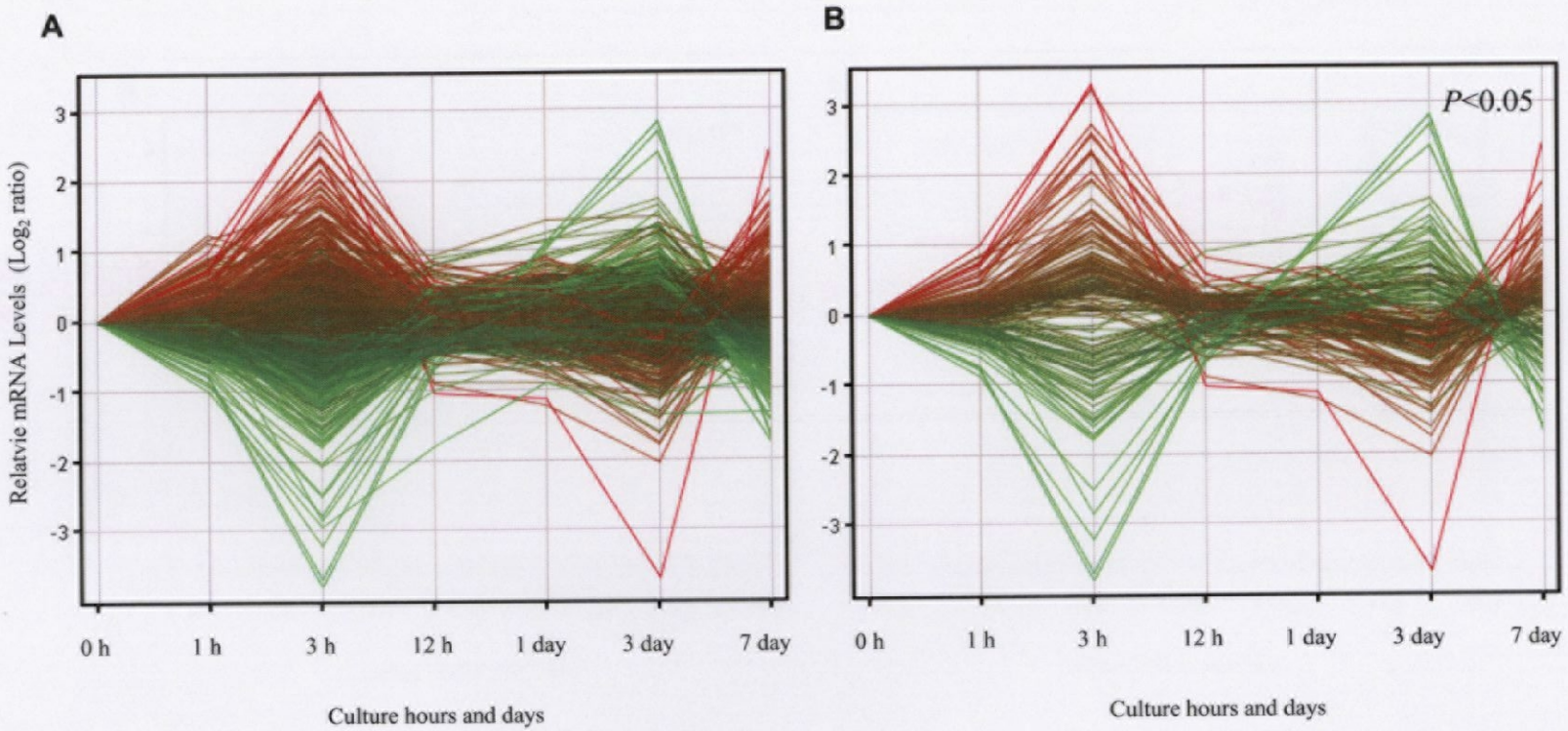


Fig. 3-9. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 33°C. Lines represent cDNA clones which showed the changes in the mRNA levels (**A**) and those at a significant level of $P<0.05$ in at least one comparison among the accumulated mRNA levels from different incubation periods (**B**). Statistical analysis was performed by Kruskal-Wallis ANOVA. Y-axis and color gradient are determined as shown in Fig. 3-5.

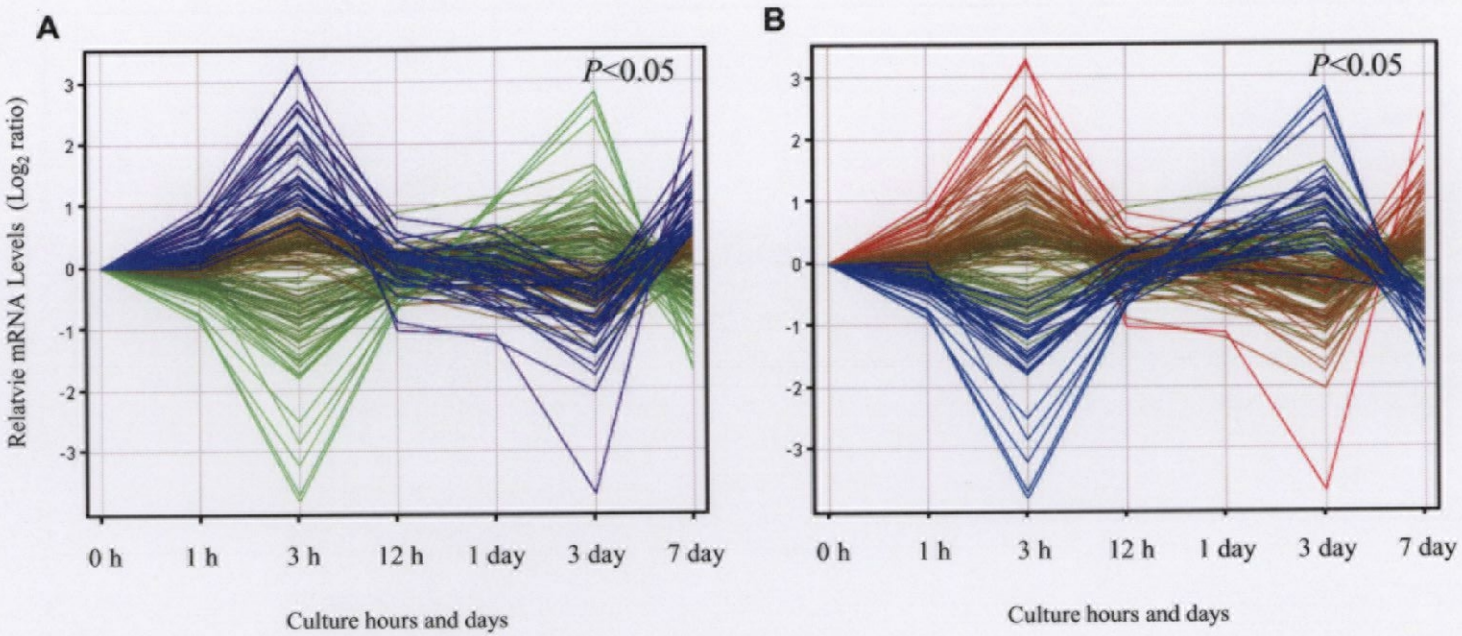


Fig. 3-10. Gene expression profiles of the OLHNI-e1 cell line during 7 days at 33°C ($P$<0.05). The expression patterns of cDNA clones which showed the changes in the relative accumulated mRNA levels more than 0.5 (**A**) and less than -0.5 (**B**) in $\log_2$ ratio of accumulated mRNA levels for 7 days are shown by blue lines. Statistical analysis was performed by Kruskal-Wallis ANOVA as shown in Fig. 3-9. Y-axis and color gradient are determined as shown in Fig. 3-5.