EXPRESSION OF FORSSMAN GLYCOLIPID SYNTHASE IN MOUSE EMBRYONIC STEM CELLS AND F9 TERATOCARCINOMA CELLS

R.P. KARUNAGODA* AND Y. KUSHI**

**Department of Agricultural Biology, University of Peradeniya, Peradeniya*
***Laboratory of Environmental Biochemistry, Obihiro University of Agriculture & Veterinary Medicine, Japan*

Forssman glycolipid (FG; GalNAcα1-3GalNAcβ1-3Galα1-4Galβ1-4Glcβ-Cer (globopentaosylceramide) is formed by the addition of GalNAc in α1-3 linkage to the terminal GalNAc residue of globoside (globotetraosylceramide), being catalyzed by Forssman glycolipid synthase (FGS; UDP-GalNAc:globoside α-1,3-*N*-acetylgalactosaminyltransferase). FG is expressed on a variety of cell lineages in a differentiation-specific manner. The objective of this investigation was to study the expression of FGS during differentiation process of the mouse embryo. As the F9 teratocarcinoma cells share similar characteristics with those of ES cells, the mouse F9 cells were also used to study the expression of FGS transcripts.

The mouse embryonic stem (ES) cells were cultured with leukocyte inhibitory factor (LIF) in order to maintain them in undifferentiated status. Some of the ES cells were grown without LIF to induce differentiation. Similarly, F9 cells were also grown and the differentiation was induced using retinoic acid (RA). The transcription level of ES cells was studied in undifferentiated cells and the cells differentiated for 14 days. The transcription level of F9 cells was investigated in undifferentiated cells and the cells induced to differentiate for 3, 6 and 9 days. RT-PCR and Northern hybridization were used to study the mRNA expression.

The FGS expression in mouse ES cells was similar in undifferentiated cells and the cells differentiated for 14 days. The F9 mouse teratocarcinoma cells, possessing identical characteristics to the ES cells, showed an increased expression at the 3rd day of differentiation and decreased later. The undifferentiated cells and the cells differentiated for around 9 days showed a similar expression. Taken together, both cells have similar characteristics in the expression of FGS mRNA during differentiation and their changes may have been triggered by the same mechanism.