



## Differential gene expression and functional analysis of pit cells from regenerating rat liver

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**ABSTRACT.** Hepatic pit cells are a population of large granular lymphocytes that substantially contribute to hepatic immunity. Studies have proven that pit cells have a role in liver regeneration, but the details of the relationship between pit cells and liver regeneration is not clear at present. We subjected rats to a two-third hepatectomy; pit cells with high purity were obtained with Percoll density centrifugation and immunomagnetic bead methods, and the changes in mRNA levels in pit cells from the regenerating liver were monitored up to 168 h using a Rat Genome 230 2.0 Array composed of 25,020 distinct rat liver cDNA clones. Of the 25,020 genes analyzed, 612 known and 358 unknown genes were identified to be associated with liver regeneration. The 612 known genes are classified into up-regulation and down-regulation patterns based on the expression levels; they primarily participate in at least 23 biological activities based on gene ontology analysis. Together with gene function enrichment analysis, cytokines and a growth factor-mediated pathway in pit cells were activated at an early phase of liver regeneration; pit cell proliferation occurred from 24-72 h after liver hepatectomy; the machinery of pit cell differentiation commenced early and came into play late; an immune/inflammatory response was enhanced late. Expression pattern analysis of functionally

classified genes in pit cells can give insights into the relationship between pit cells and liver regeneration.

**Key words:** Partial hepatectomy; Rat liver regeneration; Pit cells; Gene expression