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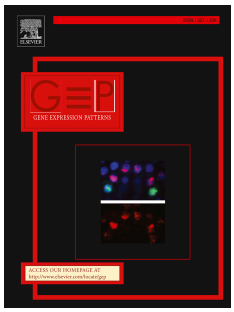

Identification of *runt* family genes involved in planarian regeneration and tissue homeostasis

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Identification of *runt* family genes involved in planarian regeneration and tissue homeostasis

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Abstract

The *runt* family genes play important roles in physiological processes in eukaryotic organisms by regulation of protein transcription, such as hematopoietic system, proliferation of gastric epithelial cells and neural development. However, it remains unclear about the specific functions of these genes. In this study, the full-length cDNA sequences of two *runt* genes are first cloned from *Dugesia japonica*, and their roles are investigated by WISH and RNAi. The results show that: (1) the *Djrunts* are conserved during evolution; (2) the *Djrunts* mRNA are widely expressed in intact and regenerative worms, and their expression levels are up-regulated significantly on day 1 after amputation; (3) loss of *Djrunts* function lead to lysis or regeneration failure in the intact and regenerating worms. Overall, the data suggests that *Djrunts* play important roles in regeneration and homeostatic maintenance in planarians.

Keywords: *runt* gene; stem cells; planarian; regeneration

1. Introduction

Runt-related transcription factors (RUNX) belong to the family of