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Gene Expression Profiles in Tadpole Larvae of *Ciona intestinalis*Takehiro Kusakabe^{a, 1} ... Yutaka Satou^b [Show more](#)<https://doi.org/10.1006/dbio.2002.0538>[Get rights and content](#)Under an Elsevier [user license](#)[open archive](#)

Abstract

A set of 12,779 expressed sequence tags (ESTs), both the 5'-most and 3'-most ends, derived from *Ciona intestinalis* tadpole larvae was categorized into 3521 independent clusters, from which 1013 clusters corresponding to 9424 clones were randomly selected to analyze genetic information and gene expression profiles. When compared with sequences in databases, 545 of the clusters showed significant matches ($P < E-15$) with reported proteins, while 153 showed matches with putative proteins for which there is not enough information to categorize their function, and 315 had no significant sequence similarities to known proteins. Sequence-similarity analyses of the 545 clusters in relation to the biological functions demonstrated that 407 of them have functions that many kinds of cells use, 104 are associated with cell-cell communication, and 34 are transcription factors or other gene-regulatory proteins. Sequence prevalence distribution analysis demonstrated that more than one-half of the mRNAs are rare mRNAs. All of the 1013 clusters were subjected to whole-mount *in situ* hybridization to analyze the gene expression profile in the tadpole larva. A total of 361 clusters showed expression specific to a certain tissue or organ: 96 showed epidermis-specific expression, 60 were specific to the nervous system, 108 to endoderm, 34 to mesenchyme, 5 to trunk lateral cells, 4 to trunk ventral cells, 23 to notochord, 28 to muscle, and 3 to siphon rudiments. In addition, 190 clusters showed expression in multiple tissues. Moreover, nervous system-specific genes showed intriguing expression patterns dependent on the cluster. The present study highlights a broad spectrum of genes that are used in the formation of one of the most primitive chordate body plans as well as for the function of various types of tissue and organ and also provides molecular markers for individual tissues and organs constituting the *Ciona* larva.







Keywords





Ciona; tadpole larvae; EST analysis; gene expression profiles; specific genes[Recommended articles](#) [Citing articles \(78\)](#)

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