**Appendix S4: Life stage-specific expression patterns**

These plots show gene expression patterns across embryonic and larval life stages for each of the 19 essential genes of interest identified in this study. The data originate from RNA-seq experiments from the modENCODE project (Hillier *et al.* 2009; Gerstein *et al.* 2010, 2014; Boeck *et al.* 2016) and the figures were retrieved from GExplore ([genome.sfu.ca/gexplore](http://genome.sfu.ca/gexplore/); Hutter *et al.* 2009; Hutter and Suh 2016). Three groups with similar gene expression patterns are presented: (A) maternal gene expression (elevated expression in the early embryo, adult, and hermaphrodite gonad); (B) maternal and zygotic gene expression (maternal gene expression with additional peaks of expression at other developmental time points); and (C) male gene expression (elevated expression in males). Some genes belong to more than one group.

(A) Maternal gene expression: gene expression elevated in the early embryo, adult, and hermaphrodite gonad.

|  |  |  |
| --- | --- | --- |
| ***atg-7*** |  | ***C34D4.4*** |
| ***C56A3.8*** |  | ***cept-2*** |
| ***D2096.12*** |  | ***dgtr-1*** |
| ***F21D5.1*** |  | ***top-3*** |
| ***trcs-1*** |  | ***ZK688.9*** |

(B) Maternal and zygotic gene expression: maternal gene expression pattern with additional peaks of expression throughout other developmental time points.

|  |  |  |
| --- | --- | --- |
| ***bckd-1A*** |  | ***cls-2*** |
| ***cpt-2*** |  | ***dlat-1*** |
| ***perm-5*** |  |  |

(C) Male gene expression: elevated expression in males.

|  |  |  |
| --- | --- | --- |
| ***bckd-1A*** |  | ***C34D4.4*** |
| ***C56A3.8*** |  | ***F56D5.2*** |
| ***nstp-2*** |  | ***T22B11.1*** |
| ***Y54G2A.73***(Figure from [wormbase.org](http://www.wormbase.org); not available from GExplore) | | |

**References**

Boeck, M. E., C. Huynh, L. Gevirtzman, O. A. Thompson, G. Wang*et al.,* 2016 The time-resolved transcriptome of C. elegans. Genome Res. 26: 1441-1450.

Gerstein, M. B., J. Rozowsky, K. Yan, D. Wang, C. Cheng*et al.,* 2014 Comparative analysis of the transcriptome across distant species.   
512: 445-448.

Gerstein, M. B., Z. J. Lu, E. L. Van Nostrand, C. Cheng, B. I. Arshinoff*et al.,* 2010 Integrative analysis of the Caenorhabditis elegans genome by the modENCODE project. Science 330: 1775-1787.

Hillier, L. W., V. Reinke, P. Green, M. Hirst, M. A. Marra*et al.,* 2009 Massively parallel sequencing of the polyadenylated transcriptome of C. elegans. Genome Res. 19: 657-666.

Hutter, H., and J. Suh, 2016 GExplore 1.4: An expanded web interface for queries on Caenorhabditis elegans protein and gene function. Worm 5: e1234659.

Hutter, H., M. Ng and N. Chen, 2009 GExplore: A web server for integrated queries of protein domains, gene expression and mutant phenotypes. BMC Genomics 10: 529.