**Table S2: Gene markers from the literature.** Cell state markers for the expression profiles used for assignment were curated from the literature [(da Veiga Beltrame et al., 2022)](https://paperpile.com/c/M2W8QA/LDCJ) and, in particular, one large study [(Murray et al., 2012)](https://paperpile.com/c/M2W8QA/AyCt).

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| --- | --- | --- | --- |
| Gene | PMID | Title | Reference |
| *mex-3* | 8861905 | MEX-3 is a KH domain protein that regulates blastomere identity in early C. elegans embryos. | Cell. 1996 Oct 18;87(2):205-16. |
| *oma-1* | 16611242 | OMA-1 is a P granules-associated protein that is required for germline specification in Caenorhabditis elegans embryos. | Genes Cells. 2006 Apr;11(4):383-96 |
| *pes-10* | 7607073 | Soma-germline asymmetry in the distributions of embryonic RNAs in Caenorhabditis elegans. | Development. 1994 Oct;120(10):2823-34. |
| *cey-3* | 25487147 | Spatiotemporal transcriptomics reveals the evolutionary history of the endoderm germ layer. | Nature. 2015 Mar 12;519(7542):219-22 |
| *end-3* | 12142026 | Dynamics of a developmental switch: recursive intracellular and intranuclear redistribution of Caenorhabditis elegans POP-1 parallels Wnt-inhibited transcriptional repression. | Dev Biol. 2002 Aug 1;248(1):128-42. |
| *hlh-26* | 15935776 | The REF-1 family of bHLH transcription factors pattern C. elegans embryos through Notch-dependent and Notch-independent pathways. | Dev Cell. 2005 Jun;8(6):867-79. |
| *mom-2* | 9288749 | Wnt signaling polarizes an early C. elegans blastomere to distinguish endoderm from mesoderm. | Cell. 1997 Aug 22;90(4):695-705. |
| *tbx-35* | 16831832 | Specification of the C. elegans MS blastomere by the T-box factor TBX-35 | Development. 2006 Aug;133(16):3097-106. |
| *tbx-37* | 15056620 | The T-box transcription factors TBX-37 and TBX-38 link GLP-1/Notch signaling to mesoderm induction in C. elegans embryos. | Development. 2004 May;131(9):1967-78. |
| *tbx-38* | 15056620 | The T-box transcription factors TBX-37 and TBX-38 link GLP-1/Notch signaling to mesoderm induction in C. elegans embryos. | Development. 2004 May;131(9):1967-78. |
| *ceh-13* | 9334268 | The expression of the C. elegans labial-like Hox gene ceh-13 during early embryogenesis relies on cell fate and on anteroposterior cell polarity. | Development. 1997 Nov;124(21):4193-200. |
| *ceh-51* | 19605496 | The NK-2 class homeodomain factor CEH-51 and the T-box factor TBX-35 have overlapping function in C. elegans mesoderm development. | Development. 2009 Aug;136(16):2735-46. |
| *cey-3* | 25487147 | Spatiotemporal transcriptomics reveals the evolutionary history of the endoderm germ layer. | Nature. 2015 Mar 12;519(7542):219-22 |
| *end-1* | 12142026 | Dynamics of a developmental switch: recursive intracellular and intranuclear redistribution of Caenorhabditis elegans POP-1 parallels Wnt-inhibited transcriptional repression. | Dev Biol. 2002 Aug 1;248(1):128-42. |
| *end-3* | 12142026 | Dynamics of a developmental switch: recursive intracellular and intranuclear redistribution of Caenorhabditis elegans POP-1 parallels Wnt-inhibited transcriptional repression. | Dev Biol. 2002 Aug 1;248(1):128-42. |
| *F19F10.1* | Data | Figure 2 | This work |
| *hlh-26* | 15935776 | The REF-1 family of bHLH transcription factors pattern C. elegans embryos through Notch-dependent and Notch-independent pathways. | Dev Cell. 2005 Jun;8(6):867-79. |
| *pal-1* | 11133155 | Zygotic expression of the caudal homolog pal-1 is required for posterior patterning in Caenorhabditis elegans embryogenesis. | Dev Biol. 2001 Jan 1;229(1):71-88. |
| *ref-1* | 15935776 | The REF-1 family of bHLH transcription factors pattern C. elegans embryos through Notch-dependent and Notch-independent pathways. | Dev Cell. 2005 Jun;8(6):867-79. |
| *tbx-38* | 15056620 | The T-box transcription factors TBX-37 and TBX-38 link GLP-1/Notch signaling to mesoderm induction in C. elegans embryos. | Development. 2004 May;131(9):1967-78. |
| *ceh-13* | 9334268 | The expression of the C. elegans labial-like Hox gene ceh-13 during early embryogenesis relies on cell fate and on anteroposterior cell polarity. | Development. 1997 Nov;124(21):4193-200. |
| *ceh-32* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ceh-43* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ceh-51* | 19605496 | The NK-2 class homeodomain factor CEH-51 and the T-box factor TBX-35 have overlapping function in C. elegans mesoderm development. | Development. 2009 Aug;136(16):2735-46. |
| *cey-3* | 25487147 | Spatiotemporal transcriptomics reveals the evolutionary history of the endoderm germ layer. | Nature. 2015 Mar 12;519(7542):219-22 |
| *dve-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo. | Genome Res. 2012 Jul;22(7):1282-94. |
| *elt-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ets-7* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *hlh-14* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo |  |
| *hnd-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *lim-7* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo |  |
| *ngn-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *nob-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo. | Genome Res. 2012 Jul;22(7):1282-94. |
| *pal-1* | 11133155 | Zygotic expression of the caudal homolog pal-1 is required for posterior patterning in Caenorhabditis elegans embryogenesis. | Dev Biol. 2001 Jan 1;229(1):71-88. |
| *pes-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *pha-4* | 9649499 | pha-4, an HNF-3 homolog, specifies pharyngeal organ identity in Caenorhabditis elegans. | Genes Dev. 1998 Jul 1;12(13):1947-52. |
| *ref-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *tbx-38* | 15056620 | The T-box transcription factors TBX-37 and TBX-38 link GLP-1/Notch signaling to mesoderm induction in C. elegans embryos. | Development. 2004 May;131(9):1967-78. |
| *tbx-8* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *unc-30* | 25738873 | The Bicoid Class Homeodomain Factors ceh-36/OTX and unc-30/PITX Cooperate in C. elegans Embryonic Progenitor Cells to Regulate Robust Development. | PLoS Genet 11(3): e1005003 |
| *ceh-13* | 9334268 | The expression of the C. elegans labial-like Hox gene ceh-13 during early embryogenesis relies on cell fate and on anteroposterior cell polarity. | Development. 1997 Nov;124(21):4193-200. |
| *ceh-16* | 15659483 | Ceh-16/engrailed patterns the embryonic epidermis of Caenorhabditis elegans | Development 132(4):739-49 |
| *ceh-27* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ceh-32* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ceh-36* | 25738873 | The Bicoid Class Homeodomain Factors ceh-36/OTX and unc-30/PITX Cooperate in C. elegans Embryonic Progenitor Cells to Regulate Robust Development. | PLoS Genet 11(3): e1005003 |
| *ceh-43* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ceh-51* | 19605496 | The NK-2 class homeodomain factor CEH-51 and the T-box factor TBX-35 have overlapping function in C. elegans mesoderm development. | Development. 2009 Aug;136(16):2735-46. |
| *elt-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *elt-7* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *hlh-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *hlh-2* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *hlh-3* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *irx-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *lag-2* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *lin-32* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *nob-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *nos-2* | 10518502 | nos-1 and nos-2, two genes related to Drosophila nanos, regulate primordial germ cell development and survival in Caenorhabditis elegans | DevelopmentVolume 126, Issue 21, November 1999, Pages 4861-4871 |
| *pal-1* | 11133155 | Zygotic expression of the caudal homolog pal-1 is required for posterior patterning in Caenorhabditis elegans embryogenesis. | Dev Biol. 2001 Jan 1;229(1):71-88. |
| *pax-3* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *pes-1* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *pha-4* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ref-1* | 15935776 | The REF-1 family of bHLH transcription factors pattern C. elegans embryos through Notch-dependent and Notch-independent pathways. | Dev Cell. 2005 Jun;8(6):867-79. |
| *ref-2* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *tbx-11* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *tbx-8* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *tbx-9* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *unc-120* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *unc-130* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *vab-7* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |
| *ztf-11* | 22508763 | Multidimensional regulation of gene expression in the C. elegans embryo | http://epic.gs.washington.edu/Epic2/ |