**Table S1**

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| --- | --- | --- |
| **RNAi gene:** | **functionality of the gene:** | **Reference:** |
| *L4440* | vector control |  |
| *lin-12* | One of the two Notch receptors required for the Y to PDA induction and fate commitment during embryogenesis. | (Jarriault, Schwab, & Greenwald, 2008]) (I. Greenwald, 2005; I. S. Greenwald, Sternberg, & Horvitz, 1983) |
| *glp-1* | Second Notch receptor involved in cell fate commitment during embryogenesis and in the control of the mitotic cycle of germ cells  | (Berry, Westlund, & Schedl, 1997; Djabrayan, Dudley, Sommermann, & Rothman, 2012; Priess, 2005) |
| *mep-1* | A homolog of the NURD complex, which is required for somatic differentiation and might counteract MES. | (Unhavaithaya et al., 2002) |
| *unc-120* | Downstream factor of *hlh-1* involved in embryonic body wall muscle development and which ectopic induction converts early embryos into muscle tissue. | (Baugh et al., 2005; Fukushige, Brodigan, Schriefer, Waterston, & Krause, 2006) |
| *lag-2* | Notch ligand. | (Lambie & Kimble, 1991; Priess, 2005) |
| *elg-27* | A member of the NODE complex required in the initiation of the Y to PDA transdifferentiation. | (Kagias, Ahier, Fischer, & Jarriault, 2012) |
| *sem-4* | A DNA-binding factor interacting with NuRD and NODE, required in the initiation of the Y to PDA transdifferentiation.  | (Jarriault et al., 2008]) (Kagias et al., 2012) |
| *ceh-6* | A member of the NODE complex required in the initiation of the Y to PDA transdifferentiation. | (Kagias et al., 2012) |
| *fbf-1* | A RNA-binding protein promoting continuous mitosis in germ cells. | (Kimble & Crittenden) |
| *fbf-2* | A RNA-binding protein promoting continuous mitosis in germ cells. | (Kimble & Crittenden) |
| *rnt-1* | The Runx transcription factor crucial to regulate the balance between seam cell proliferation and differentiation, promoting the proliferative fate in posterior seam daughters. | (Kagoshima et al., 2007; Nimmo, Antebi, & Woollard, 2005; Xia, Zhang, Huang, Sun, & Zhang, 2007) |
| *cki-1*  | A cyclin-dependent kinase inhibitor only expressed in the Y cell and believed to be required for Y to PDA transformation initiation. | (Richard et al., 2011) |
| *ceh-16*  | Seam cell homeostatic control between differentiation and proliferation. *ceh-16* loss of function mutation willdrive seam cells into differentiation.  | (Huang, Tian, Xu, & Zhang, 2009) |
| *apr-1* | A member of the Wnt signaling pathway, suppressor of *ceh-16(lf)* mutations*.* | (Huang et al., 2009) |
| *mex-3*  | Involved in germline fate maintenance. Mutation causes ectopic transdifferentiation of germ cells. | (Ciosk, DePalma, & Priess, 2006) |
| *gld-1*  | Involved in germline fate maintenance. Mutation causes ectopic transdifferentiation of germ cells. | (Ciosk et al., 2006) |
| *mes-4* | Regulation of active chromatin states and the exclusion of the MES-2/MES-3/MES-6 chromatin repression complex from the autosomes.  | (Fong, Bender, Wang, & Strome, 2002) |
| *dpy-30* | A nuclear protein essential early in embryogenesis for dosage compensation, believed to be involved in epigenetic regulation of transcription. | (Hsu, Chuang, & Meyer, 1995) |
| *egl-38* | Mutations cause additional transdifferentiation of a second rectal cell into a PDA neuron. | (Chamberlin et al., 1997; Jarriault et al., 2008) |
| *mab-9*  | Mutations cause additional transdifferentiation of a second rectal cell into a PDA neuron. | (Chisholm & Hodgkin, 1989; Jarriault et al., 2008) |
| *bet-1*  | Methylated histone binder, involved in cell fate maintenance. | (Shibata, Takeshita, Sasakawa, & Sawa, 2010) |
| *mys-1* | Member of the MYST family of histone acetyltransferases (MYST HATs) which regulates BET-1 and is believed to maintain cell fate. | (Shibata, Sawa, & Nishiwaki, 2014; Shibata et al., 2010) |
| *mys-2*  | Member of the MYST family of histone acetyltransferases (MYST HATs) which regulates BET-1 and is believed to maintain cell fate. | (Shibata et al., 2014; Shibata et al., 2010) |
| *utx-1* | Downstream factor of *glp-1/*Notch signalling in the germline (personal communications B. Tursun and Ciosk), H3K27 demethylase. | Pers. comm. B. Tursun/R. Ciosk |
| *set-2* | A H3K4 methyltransferase required during the Y to PDA transdifferentiation. | (Zuryn et al., 2014) |
| *wdr-5.1* | A H3K4 methyltransferase required during the Y to PDA transdifferentiation. | (Zuryn et al., 2014) |
| *lin-53* | Involved in germline fate maintenance. Mutation renders germ cells plastic towards an induced neuronal differentiation. | (Tursun, Patel, Kratsios, & Hobert, 2011) |
| *sir-2.1* | A sirtuin that deacetylase telomeric histones and protect those homologues sequences from recombination events. | (Wirth et al., 2009) |

**References for Table S1**

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