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A screen for mutations that affect programmed cell death in the ventral cord

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We have developed an efficient screen for mutations that affect the survival or death of specific ventral cord cells during normal development. A *lin-11::gfp* reporter construct is expressed in the six VC motor neurons that arise from the P3-P8 lineages as Pn.aap cells. The lineally equivalent Pn.aap cells from the W, P1, P2 and P9-12 lineages die by programmed cell death. In *ced-3* animals, in which cell death is prevented, all the "undead" Pn.aap nuclei express GFP and fluoresce brightly. We are using this reporter to screen for mutations that result in the survival of Pn.aap cells in lineages in which they normally die, or the death of Pn.aap cells in lineages in which they normally survive.

Hermaphrodites are mutagenized with EMS, and the F2 progeny are screened using a stereomicroscope for animals with an abnormal number or pattern of fluorescing nuclei. To date, 20,000 haploid genomes have been screened, and 70 mutants isolated. Mutants with abnormal survival of Pn.aap cells include new loss-of-function mutations in *ced-3*, *ced-4*, and *egl-1*. New *pag-3* alleles have been recovered (see abstract by Cameron *et al.*). Mutants with abnormal death of Pn.aap cells include alleles of at least one gene not previously identified as affecting Pn.aap survival. As the Pn.aap cells are sexually dimorphic, weak, self-fertile Tra mutations are also recovered. Mutants isolated in this screen will be characterized with the goal of identifying the factors that determine whether individual Pn.aap cells survive or die.