

A Screen for Genes Involved in Engulfment-Dependent Cell Death

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Programmed cell death occurs during the normal development of many organisms. The *C. elegans* cell-death pathway has been extensively studied for a variety of cells that are fated to die. During programmed cell death, caspases are activated in the dying cell. The cell corpse is then engulfed by a neighboring cell and degraded. In most cases, cell death is cell-autonomous and caspase-dependent, and can occur even in engulfment-defective animals.

During development of the *C. elegans* male, the cells B.alapaav and B.arapaav are generated during the late L3 stage. During the early L4 stage one of these cells undergoes caspase-dependent programmed cell death and the other survives. The decision of which cell dies and which survives is stochastic. The cell that dies is engulfed by the neighboring cell P12.pa. If engulfment is blocked through a mutation in one of the genes in the engulfment pathway or by ablating P12.pa, both B.alapaav and B.arapaav survive. If one cell is ablated by laser microsurgery, then the other cell will invariably survive. These cells form an equivalence group: both have the potential to either survive and form part of the male tail or undergo programmed cell death. These observations suggest that cell interactions between B.alapaav and B.arapaav and between B.al/rapaav and P12.pa are involved in this cell death.

We will investigate the regulation of this unusual programmed cell death. To this end, we will perform a genetic screen to identify genes that function in B.al/rapaav cell death. *cog-1::GFP* has been reported to be expressed in B.alapaav and B.arapaav. Using this reporter strain, we will screen for mutants in which neither or both B.alapaav and B.arapaav are present because of misregulation of fate determination or of engulfment-dependent cell death. This screen might identify new genes involved in fundamental mechanisms of programmed cell death, cell-cell signaling and fate determination within equivalence groups.

Poster

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