Title: C. elegans development.

Caenorhabditis elegans development.

C. elegans gametes. Hermaphrodites undergo spermatogenesis during late larval stage 4 (L4) and oogenesis during young and early adulthood. Males undergo spermatogenesis throughout adulthood. Crosses should be done with L4 males to preempt self-fertilization.

Lethargus is a state of inactivity that occurs at each molt during the transition between larval stages, during which collagen is synthesized and old cuticle is shed.

Dauer stage is an alternative development state, like a holding pattern. This occurs as a result of harsh environmental conditions such as population density, food scarcity, and temperature. This holding pattern is committed at L2 molt and is triggered by a pheromone.

Dauer worms are thin, fast-moving, resist metabolic stress, long-lived, and undergo glyoxylate-based metabolism.

95% of the mitochondrial DNA of a worm resides in the germline. mtDNA is unchanged until L4. mtDNA copy number increases 5-fold between L4 and Day 1, and a further 6-fold between Day 1 and Day 4. Copy number stabilizes at around day 2.

Metabolism before L2 and during dauer is glyoxylate-based. During L2 and beyond they utilize aerobic respiration in the form of glycolysis and oxidative phosphorylation.

Temperature affects mtDNA and metabolism, too. Exposure to 16°C slows development, 20°C maintains typical development, and 25°C speeds development, as 20°C is typical rearing temperature.

They have a 3-day life cycle at 20°C: hatching about 12 hours after fertilization, with each embryonic stage lasting around 2 hours. L1 lasts about 16 hours, L2, L3, and L4 last about 12 hours. Young adulthood is about 2 days until adults become gravid.