

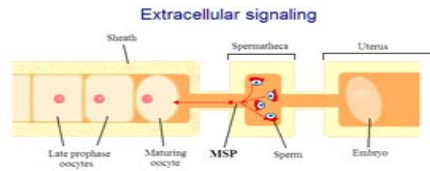


The Role of *sgd-8* in the Control of Oocyte Meiotic Maturation in *Caenorhabditis elegans*



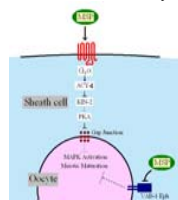
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1) Oocyte meiotic maturation



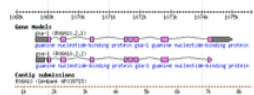
- physiological changes in oocytes prior to zygote formation
- essential for meiosis and fertilization
- In humans, mistakes can cause chromosome missegregation, leading cause of miscarriage and birth defects
- Major sperm protein (MSP) promote oocyte meiotic maturation by binding VAB-1 Eph receptor¹

- G_sα signaling pathway functions in parallel to VAB-1 pathway in regulation of meiotic maturation²



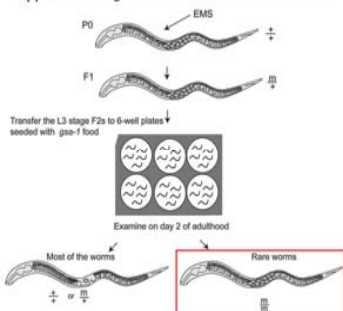
*gsa-1*³

- Encodes a G_sα subunit of G protein
- Affects L1 larval stage viability, movement, and egg laying
- Homologs in many organisms, *Homo sapiens*, *Mus musculus*, *Drosophila melanogaster*, *Saccharomyces cerevisiae*



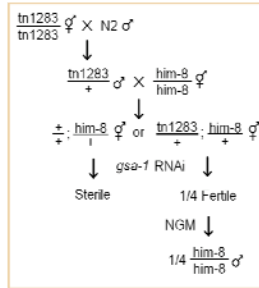
2) Forward genetic screens

suppressors of *gsa-1* meiotic maturation defect



- Screened ~80,000 haploid genomes for fertility on *gsa-1* RNAi
- Identified ~32 mutants that suppress *gsa-1*

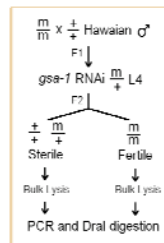
3) Generating *tn1283; him-8*



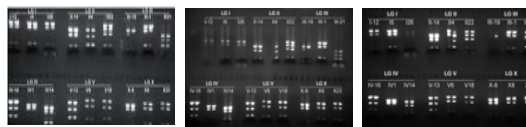
• Aids in crossing *tn1283* animals to other strains

• *him-8* (IV: 4.46cM) hermaphrodite animals can give male progeny without mating with a male

4) Chromosome Mapping



- *tn1283* in LG III
- complementation test showed *tn1285*, *tn1342*, *tn1297*, and *tn1334* are also alleles of *sgd-8* (suppressor of *gsa-1* maturation defect)
- middle arm of LG III



tn1283

tn1285

tn1342

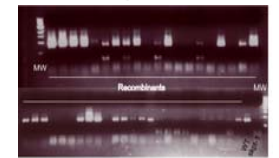
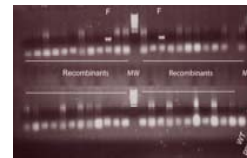
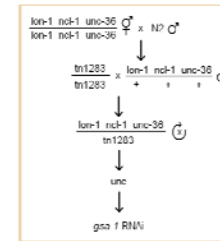
tn1297

tn1334



LG III

5) Fine mapping

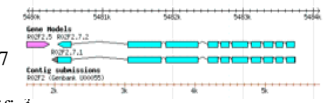


6) RNAi clones testing

WT (N2) tested with all available RNAi clones between *dpy-17* and *ced-6*

• Candidate gene: R02F2.7

- LG III: -1.64cM
- *Caenorhabditis* specific³



References

1. Yamamoto, I., Kosinski, M.E., and Greenstein, D. (2006). Start me up: cell signaling and journey from oocyte to embryo in *C. elegans*. *Dev. Dyn.* 235, 571-585
2. J. Amarantath Govindan, Hua Cheng, Jana E. Harris, David Greenstein. (2006). G_sα and G_qα Signaling Function in Parallel with the MSP/Eph Receptor to Control Meiotic Diapause in *C. elegans*. *Current Biology*. 16(13) pp. 1257 - 1268
3. www.wormbase.org

Acknowledgement

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