

RNAiDB and PhenoBlast:

web tools for genome-wide phenotypic mapping projects

(but for now focused on *Caenorhabditis elegans*)

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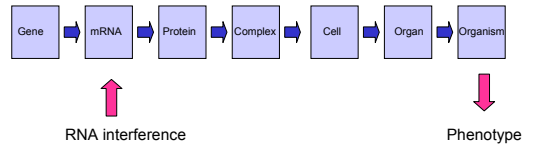
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Functional Genomics

Determine the function of every gene found in the Genome

RNA interference (RNAi) experiment

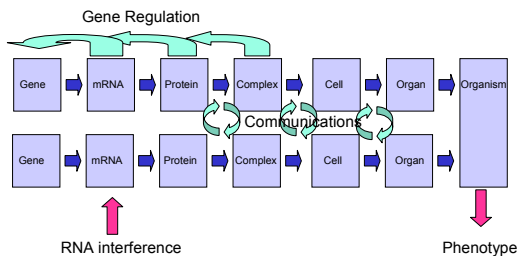


C. elegans is a relative simple and validated model systems
 ~100,000,000 bases ~17,800 distinct genes - all sequenced
 1 mm - 959 somatic cells - 2-3 weeks life span - clear body



Function is Multifaceted

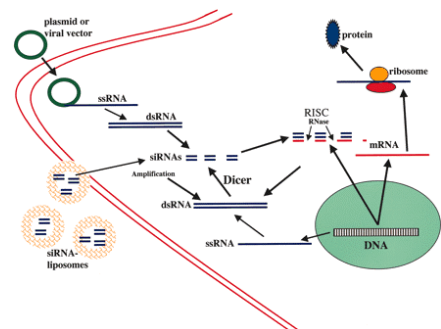
Different functions in : System, Cells and Stages of Development



Result: Function of a gene in a Pathway

RNA interference (RNAi)

The insertion of dsRNA to deplete gene function(s)



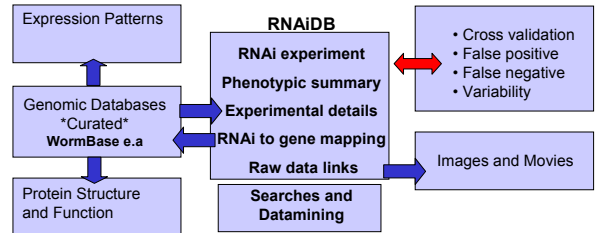
The Challenge

- Standardization and archiving of experimental RNAi data
- Distributing and mining of genomic, RNAi and phenotypic data

- ↑ RNA interference experimental details
- Sequence: primers & vectors
 - Gene mappings: one or multiple targets
 - Insertion methods
 - Other lab procedures

- ↓ Phenotypic data
- Complex information
 - Traditional in Free text format
 - Stages in development
 - Structured vocabulary needed

The Database



•Object oriented database engine **AceDB** (same as WormBase)

•Web Access via AcePerl and BioPerl on a Linux system

RNAi Experiment

RNAi Experiment: PF:GL1_1A7

Experiment Summary	Genes Potentially Inhibited
Genes Potentially Inhibited C03C10.3 [GenePairs]	Genes Potentially Inhibited C03C10.3 Go to Gene-ORF Page
Locus trc-2 Description Ribonuclease-diphosphate reductase M2 [WormBase] Chromosome III	
Template Type PCR_product Template ID trc-C03C10.3 Date 2002-11-19 Delivery Method Injection Remark PCR product contains flanking T7 promoter sequences	

Phenotypes for PF:GL1_1A7

Embryo

Early Embryonic Phenotypes

- Abnormal nuclear reassembly
- Chromatid defect
- EMS fails to extend anteriorly
- Exaggerated attachment
- Excessive blebbing
- Large cytoplasmic granules
- P0 spindle does not rotate
- Pseudonectin most sensitive
- Slow cell cycle

Larva

Adult or Postembryonic

RNAi Experiment II

RNAi Experiment: PF:GL1_1A5

Experiment Summary	Genes Potentially Inhibited
Genes Potentially Inhibited CS2D10.7 [GenePairs]	Genes Potentially Inhibited CS2D10.7 Go to Gene-ORF Page
Locus trc-9 Description cyclin A-associated protein [WormBase] Chromosome IV	
Template Type PCR_product Template ID trc-CS2D10.7 Date 2002-11-19 Delivery Method Injection Remark PCR product contains flanking T7 promoter sequences	

Phenotypes for PF:GL1_1A5

Locus trc-10 Description contains similarity to Pfam domain PF01466 (Skp1 family), Scores=153.3, E-value=1.4e-42, N=1 Chromosome IV	
Locus trc-7 Description C. elegans SER-7 protein; contains similarity to Pfam domain PF01466 (Skp1 family, dimerization domain) Chromosome V	

