

Coordination between cell proliferation and differentiation using *C.elegans* germline stem cells.

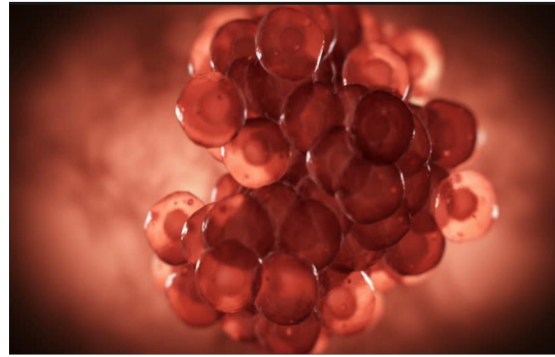
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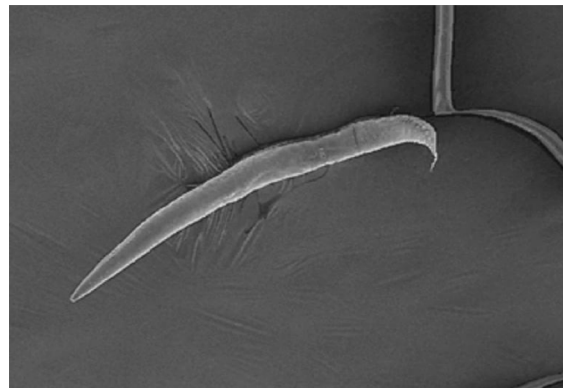
C.elegans germline stem cells may inform us on regulation of cancer stem cells



cancer treatment

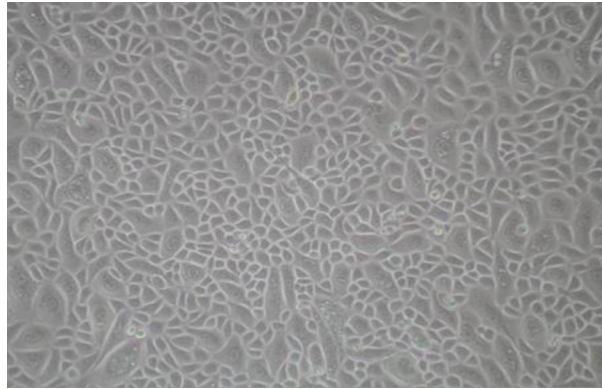


human

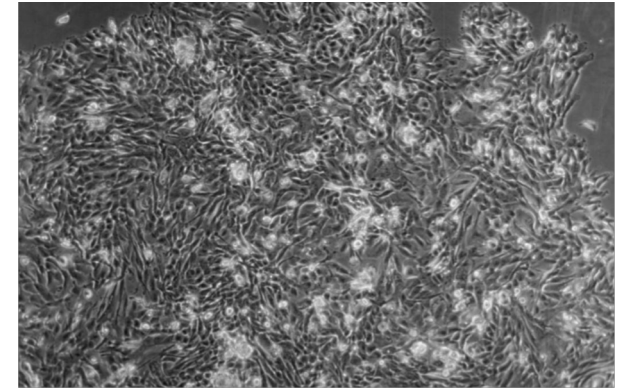
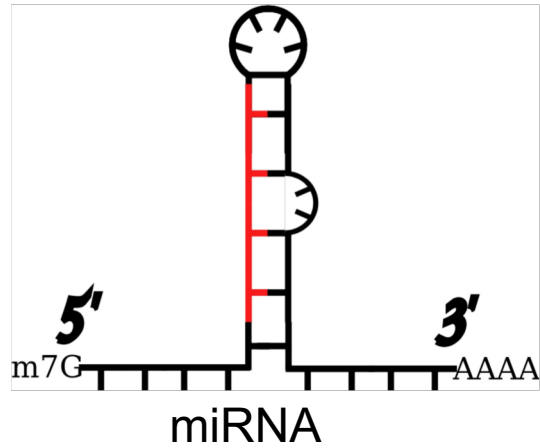


C.elegans

Expression of miRNAs is associated with tumor formation



normal cells



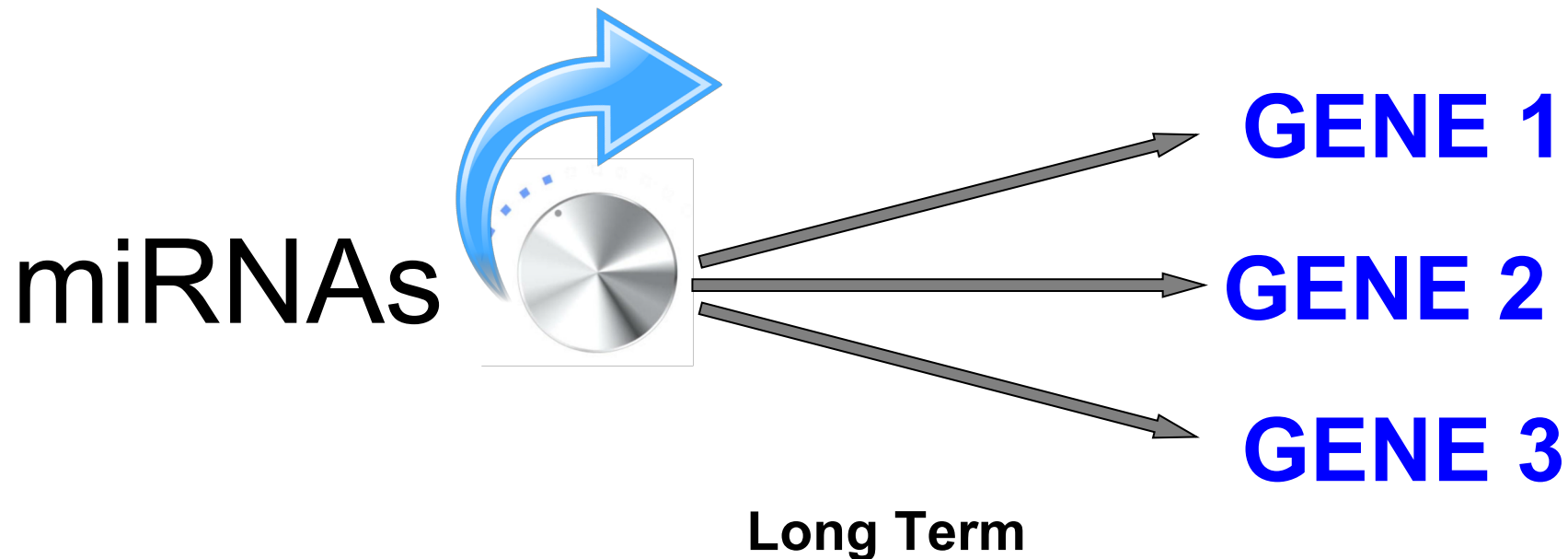
cancer cells



Summer 2019:

To control the presence or absence of miRNA and determine if germline cells undergo tumorigenesis.

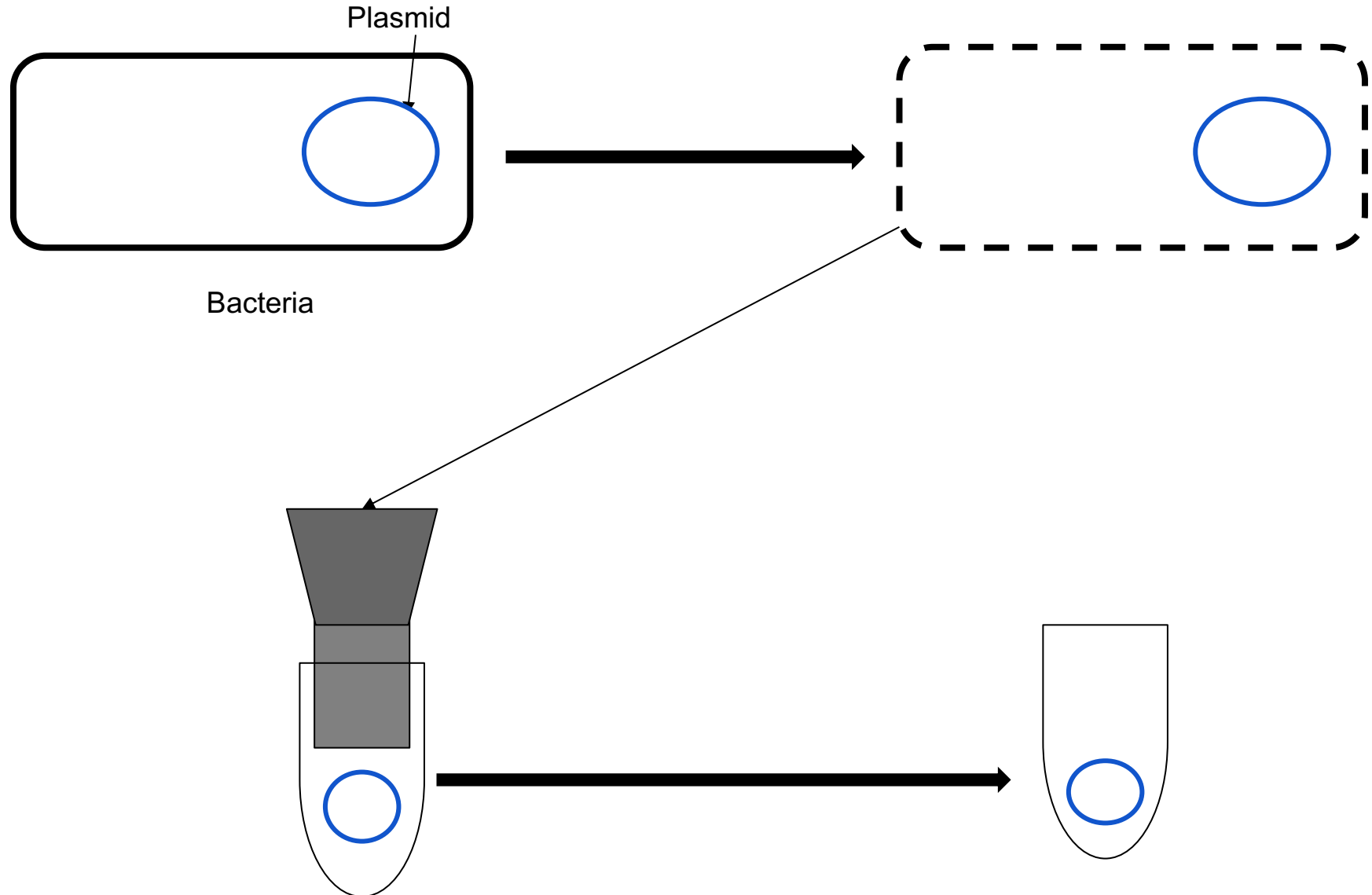
Over-expression of miRNA promote tumor formation by downregulating tumor suppressors



Understand how miRNA regulates gene expression to maintain stem cell homeostasis


Generation of an inducible system of expression of miRNAs

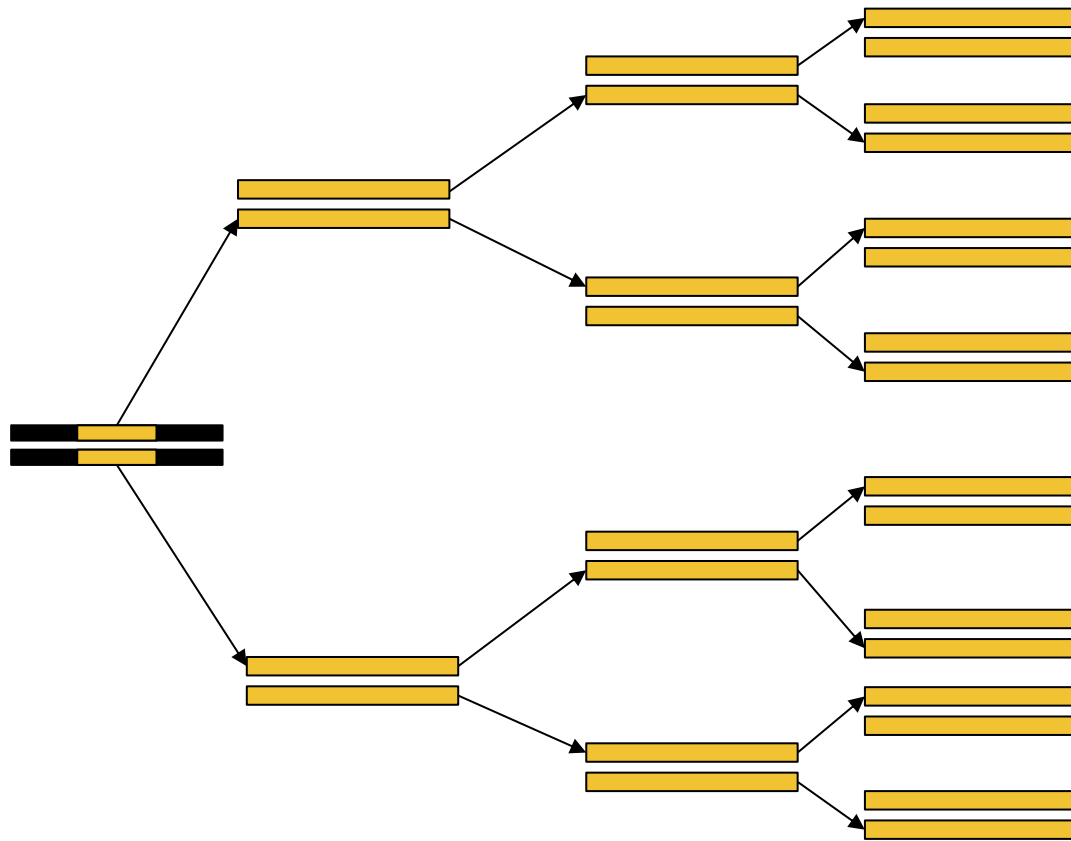
Step 1: Preparation of plasmid vector containing inducible heat shock promoter



Generation of an inducible system of expression of miRNAs

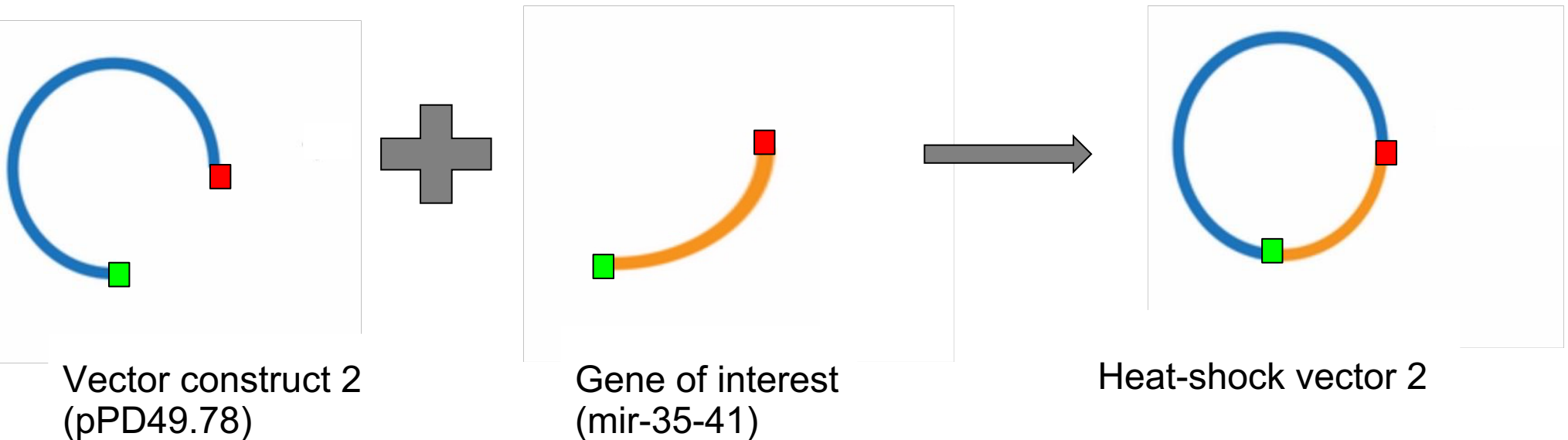
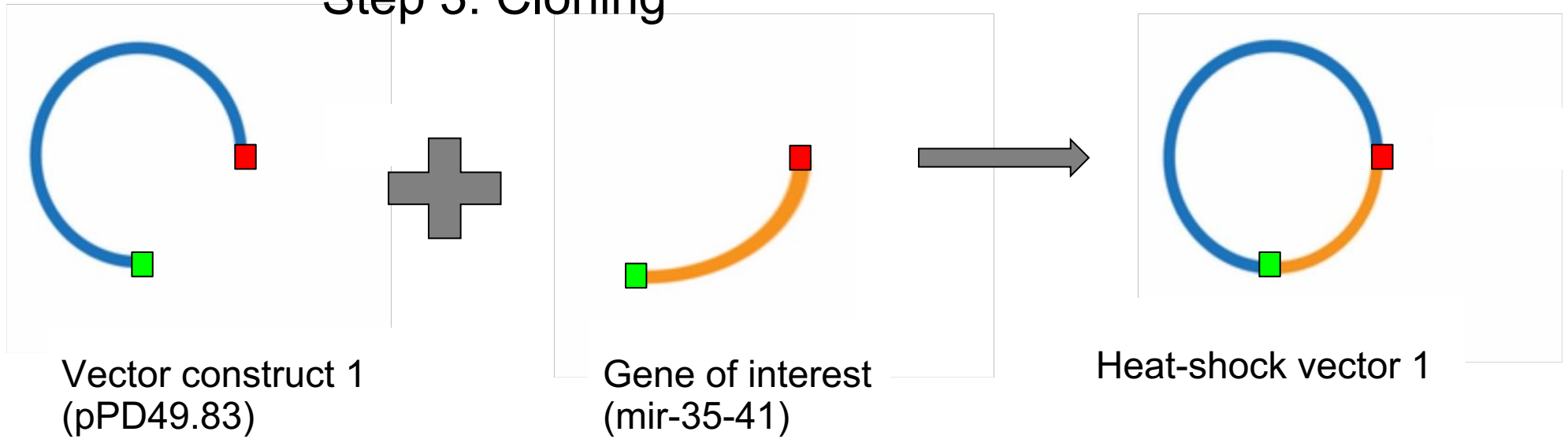
Step 2: PCR amplification of gene of interest

 Gene of interest (mir-35-41)



Generation of an inducible system of expression of miRNAs

Step 3: Cloning



Purification of DNA samples aids successful cloning

Observed Concentrations

Units:
ng/microL

Trial	Gene of Interest	Vector 1	Vector 2
1	25.2	11.3	15.6
2	45.7	39.9	37.6
3	49.8	52.4	57.3
4	89.2	71.8	77.2
5	108.7	153.3	119.7
6	939.7	163.2	132.1

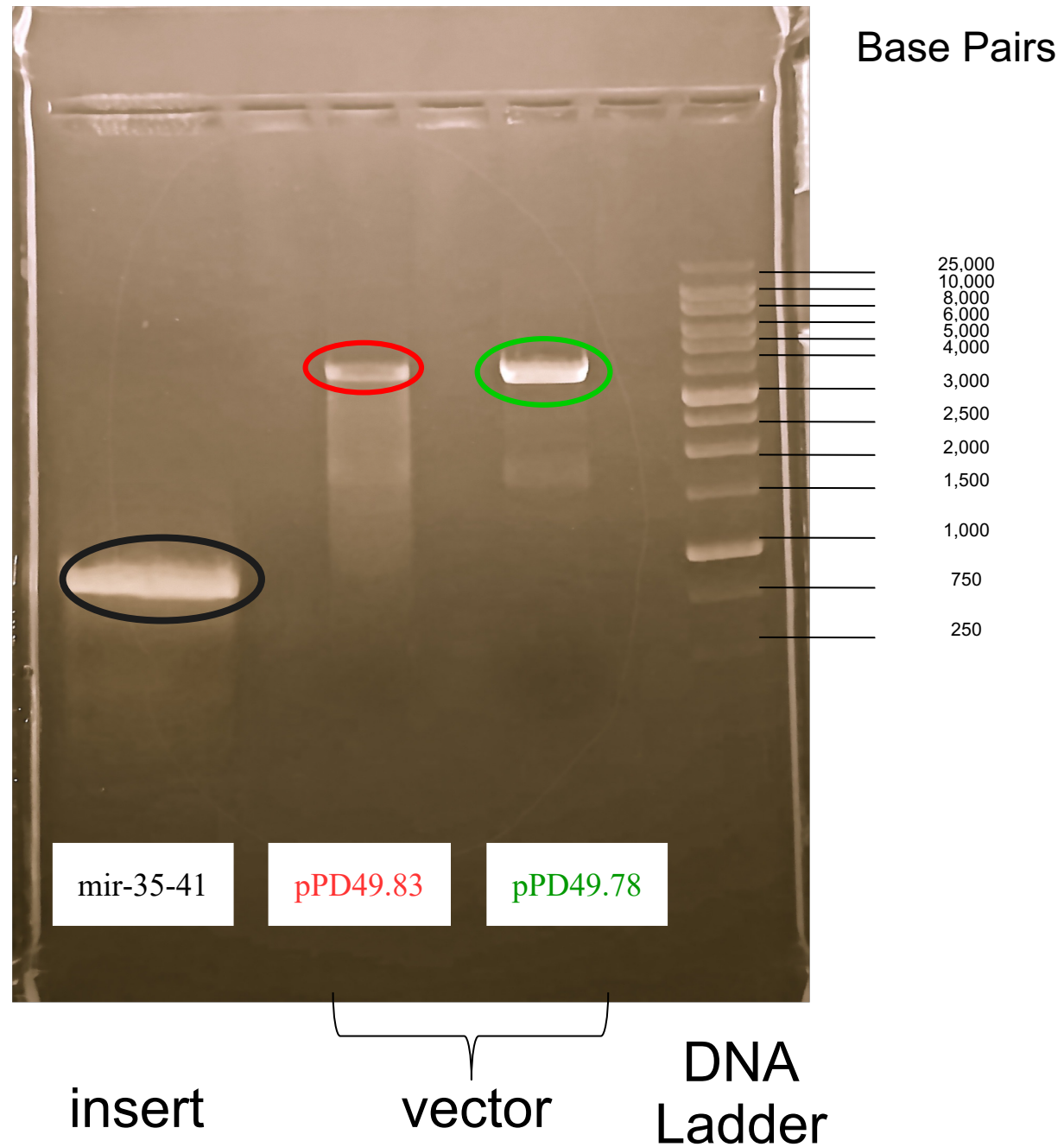
Confirming DNA sample size using Agarose Gel Electrophoresis

Expected Size:

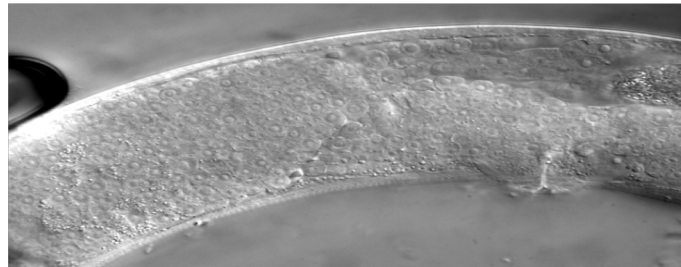
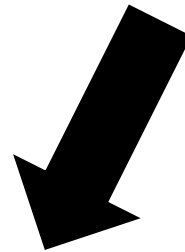
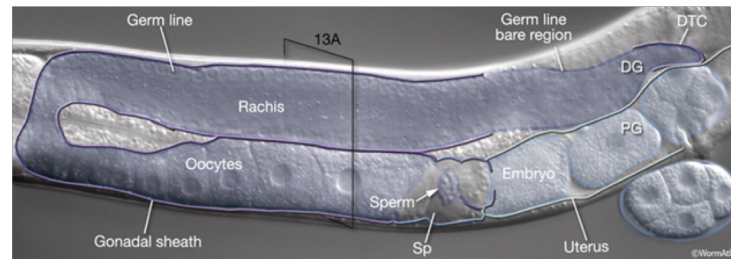
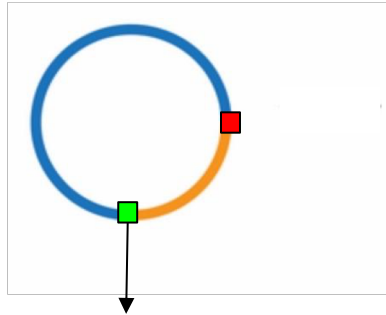
1) mir-35-41 - 777 bp

2) pPD49.83 - 3896 bp

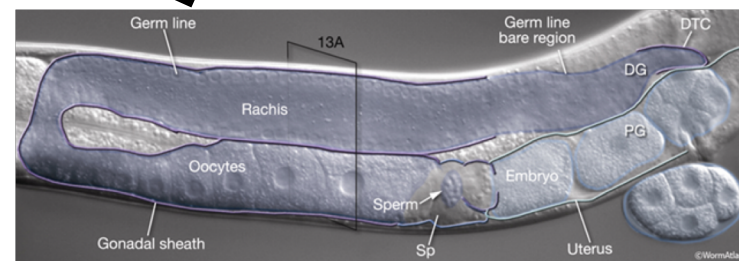
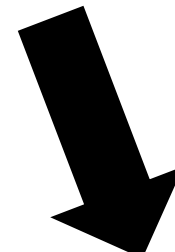
3) pPD49.78 - 3727 bp



Injection of Heat-shock vector results in distinct phenotypes



cancer cells



normal cells

Acknowledgements



Dr. Pradeep Joshi PhD
Project Scientist, Rothman Lab