Overview:

- Introduce students to the history of RNA Interference (RNAi) and its applications in common model organisms with a focus on the experimental design.
- Students perform RNAi experiments in *Nicotiana benthamiana* (tobacco plants), in *Caenorhabditis elegans* (*C. elegans*) and in mammalian cell culture (human embryonic kidney cell line, HEK293).

**Lectures:**

1. Introduction to RNAi
2. Post Transcriptional Gene Silencing in Plants
3. *C.elegans*: RNAi History and Experiments
4. *Drosophila*: RNAi Background and Experiments
5. RNAi and Mammalian Systems
6. MicroRNAs, Antisense RNA and Other RNA Silencers
7. Therapeutic Uses of RNA

**Labs:**

1. Preparation of DNA-Directed Silencing Constructs 1 week
2. Virus Induced Gene Silencing of Magnesium Chelatase, a Chlorophyll Biosynthesis Enzyme, in Tobacco Plants. Real time RT-PCR Assay. 5 weeks
3. *C.elegans* RNAi Experiment to Knockdown Transgenic GFP Expression via Feeding of Silencing Constructs. Qualitative Phenotypic Assessment. 2 weeks
4. Transient Transfection Delivery of Short Hairpin RNA Expression Plasmids to Mammalian Cell Culture. Semi-quantitative Western Blot. 3 weeks