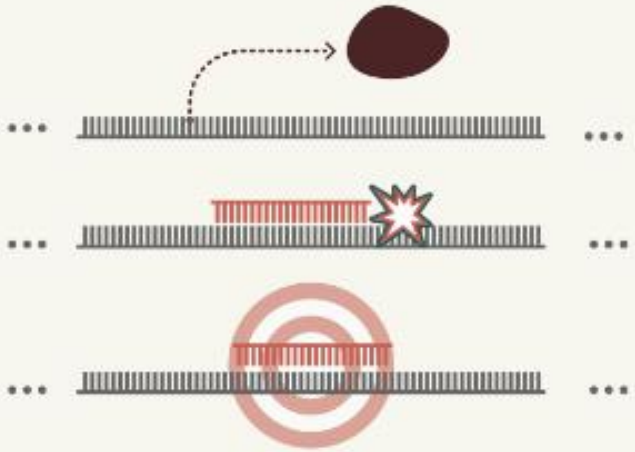
WHAT IS RNAi?

PEBBLE LABS

RNAi or "RNA interference" is a form of molecular defense in which cells selectively destroy or prevent the decoding of genetic information encoded in RNA molecules.

Targeting mRNA with RNAi



Living things and viruses use messenger RNA molecules (mRNA) to direct the creation of proteins that carry out a variety of functions. For example, a virus may contain mRNA molecules encoding proteins that help them replicate.

Many living things also use small RNA molecules called siRNAs to direct cellular proteins to cut and destroy or "silence" mRNAs. This can decrease the production of proteins encoded in the mRNAs. Cells use siRNAs to regulate the production of their own proteins and prevent invaders, like viruses, from creating proteins that will kill the cells. In this sense, siRNAs provide a sort of immunity.

To target a particular mRNA, the sequence of the siRNA must match up with a short segment of the mRNA. Many plants and animals naturally produce siRNAs with sequences that match up with viral invaders. Thus, these plants and animals are protected from the viruses.

RNAi in shrimp and plants

Shrimp species like Whiteleg shrimp (Penaeus vannamei), also known as Pacific white shrimp or King prawn, are incredibly important agriculturally but are susceptible to infection from viruses like white spot syndrome virus (WSSV). Shrimp farmers can protect their animals from viruses with RNAi.

Plant viruses and other pests can devastate crop yields. Farmers can provide plants with RNAi molecules that will protect them from these pests.

The molecular details of RNAi