1. Needs:
    a. Need for therapeutics that can target neurodegenerative diseases in a novel form
    b. Need for proof of concept of RNA mutagenesis for therapeutics
2. Constraints
    a. Minimal regulatory affairs at this point, more to come as therapeutic develops
    b. Risks are toxicity of snRNA to cells
    c. Global impact of Alzheimer's disease therapeutics would be incredible, as people are affected around the world.
    d. Should be easy to manufacture, as oligonucleotide manufacturing is cheap and fast
    e. Marketability will be easy since everyone wants to treat this condition
3. Engineering standards
    a. Standards for this project are less necessary at this point but would be necessary if the molecule was ever used as a therapeutic. According to the FDA, many standards would have to be met for a gene therapy to go to market, including an animal study, tumorigenicity analysis, proof of concept studies, toxicity, design of cell distribution studies, and dose levels.
4. Ethical, Environmental, or Societal concerns
    a. One major concern is the ability of the modified U1 snRNA therapeutic to effectively reach neurons in the central nervous system, as the blood-brain barrier may limit delivery and reduce therapeutic benefit. Even if the therapeutic reaches the CNS, inefficient neuronal uptake could prevent effective splice correction. Another important risk is immune recognition of the modified RNA, which could trigger neuroinflammation or other adverse immune responses. Addressing these risks would involve design trade-offs, such as modifying the RNA to improve stability and delivery while minimizing immunogenicity.
5. Active Teamwork and Leadership
    a. My teammate and I had many open and inclusive discussions about our project
    b. I took on many of the coding-heavy tasks related to visualization and stability prediction, while Anya did more structural organizational tasks such as report layout. We shared wet lab responsibilities.
    c. We reached our goals and deadlines when made
    d. We received constructive feedback from Trent about being proactive
6. Motivating factors
    a. I acquired a great deal new knowledge about wet lab techniques and how to conduct a research project
    b. When I was motivated and excited about the science of the project I was very self-initating.
    c. We persisted many times when our data came out bizarre or we were not able to clone effectively.
7. My most innovative ideas were related to the design construction of the hairpins. I decided to get rid of the inner loop and use literature informed stable tetraloops to make informed decisions.