Create an adhesive based off of marine mussel bioadhesives to outperform traditional petroleum based adhesives in wet environments.

Mussel adhesive proteins work in water-rich environments, adhere to many surfaces; both organic and inorganic, and have high biocompatibility. This makes them ideal for use as surgical glues.

The adhesive is produced using recombinant DNA in bacteria. A strand of DNA encoding for a protein is spliced into E. Coli DNA, the E. Coli is allowed to reproduce, then the cells are lysed and the adhesive protein is separated, purified, and activated.

Other Information
- Process goal is to produce enough adhesive annually to be capable of capturing 5% of the U.S surgical glue market.
- 1640 kg / year is the flux designed for
- Other host organisms such as yeast or Chinese hamster ovaries were considered, but the protein is simple enough for E. Coli to produce, E. Coli are cheap, and there is existing research on mussel adhesion protein production in E. Coli.
- The only mussel based adhesive currently on the market is extracted from mussels, requiring 10,000 mussels to produce 1 gram.

To learn more, visit calvin.edu/academic/engineering/2015-16-team20/