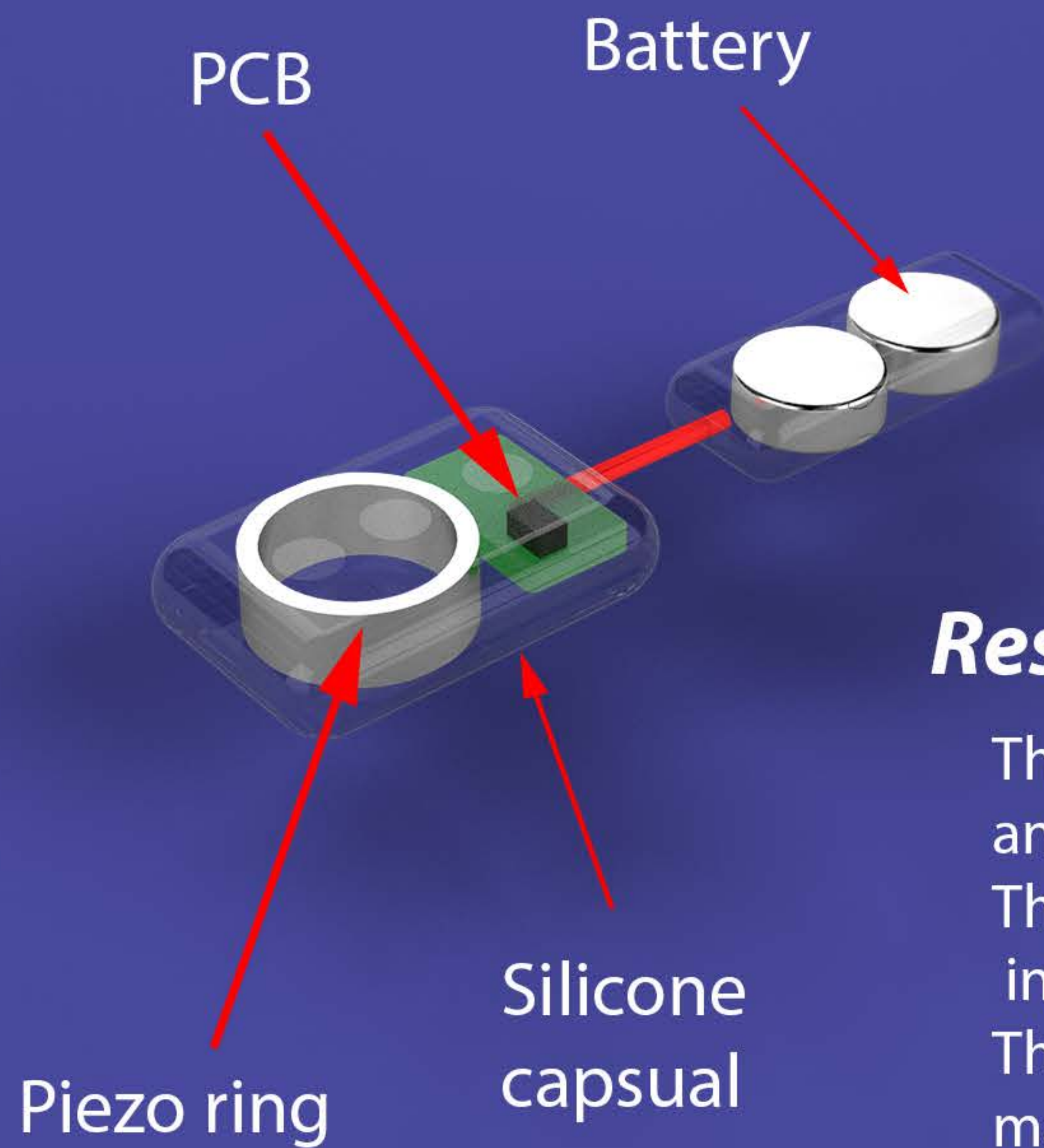


Encapsulation of biosensor for stress monitoring in fish: A study on design and material evaluation



Scope of the project

The purpose of this study is to evaluate the materials (silicone and epoxy) and the shape of an implantable health-monitoring system for fish called FishTag. The tag measures biomarkers on stress in the fish, transmits the data out of the pen and onto a computer for the end-user.

Results

Through water absorption and stress testing, it showed the epoxy to gain ~2 weight percent (wt%) and the silicone to gain ~0.2wt%. The stress test left a transmitting tag submerged in water for a week. This was to test the epoxy's ability to keep the system safe for an extended period of time in a wet environment and if the epoxy would crack from the acoustic signals.

The tag was still transmitting after a week, meaning that the most water-absorbing material was sufficient at keeping the system safe from water.

The system was split into two parts: PCB, piezo ring and sensors in one, and battery in the other. A narrower profile was achieved by laying the piezo next to the PCB. This design lets the battery be switched later while being able to re-use piezo and PCB.



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