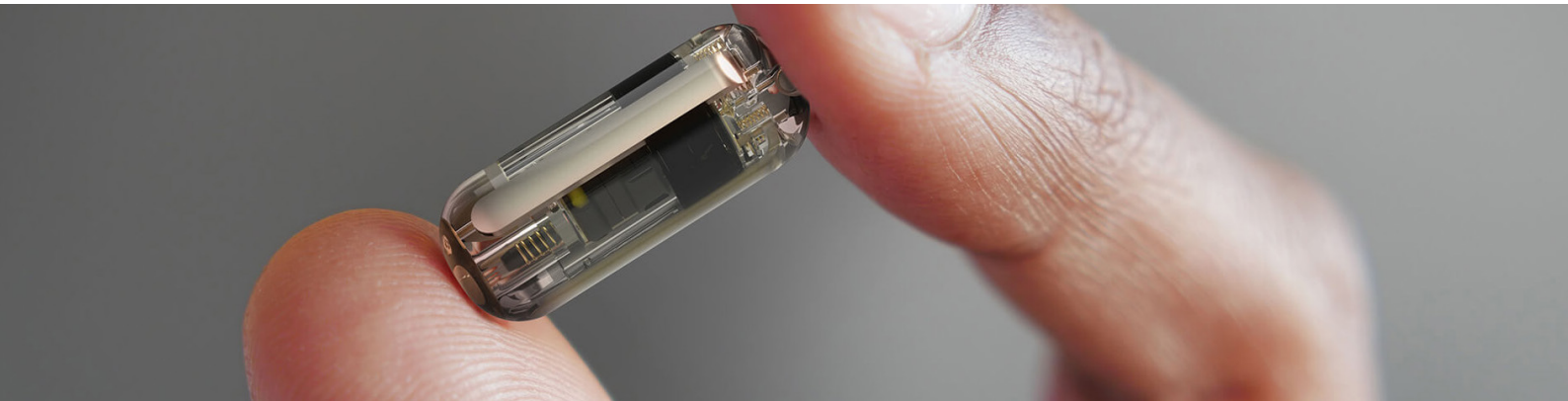


Gastric-Resident Robotics for GI Monitoring and Drug Delivery



Client

Massachusetts Institute of Technology (MIT)

Practice Areas

Smart Medical Devices

Core Disciplines

Software Engineering
Mechanical Engineering
Systems Engineering
Electrical Engineering
Quality System Management

Challenge

Triple Ring collaborated with MIT under a DARPA-funded program to advance a novel gastric-resident robotic capsule from an early-stage research concept toward clinical readiness. The swallowable capsule was designed to remain in the stomach for weeks to months, wirelessly monitor physiological data, and deliver multiple doses of therapeutics on command.

The program focused on transforming an innovative ingestible technology into a biocompatible, manufacturable medical device capable of supporting animal studies and future clinical evaluation.

Solution

Triple Ring applied its multidisciplinary engineering and manufacturing expertise to translate the research concept into a manufacturable medical device.

The development program emphasized:

- Refining the device architecture to improve performance, manufacturability, and long-term reliability
- Designing and validating a custom antenna capable of reliable wireless communication through human tissue
- Selecting materials that met demanding requirements for biocompatibility, barrier performance, and bond strength
- Developing manufacturing processes and fixtures for laser welding, encapsulation, dip coating, bonding, and final assembly
- Establishing product requirements, verification methods, and design documentation within an FDA-compliant quality system
- Supporting prototype builds, verification testing, and animal studies conducted at MIT

Find more case studies on our website:

